

Symmetra™ PX

96 and 160 kW 400 V

Installation

11/2023



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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.

Per IEC 62040-1: "Uninterruptible power systems (UPS) -- Part 1: Safety Requirements," this equipment, including battery access, must be inspected, installed and maintained by a skilled person.

The skilled person is a person with relevant education and experience to enable him or her to perceive risks and to avoid hazards which the equipment can create (reference IEC 62040-1, section 3.102).

Electromagnetic Compatibility

NOTICE

RISK OF ELECTROMAGNETIC DISTURBANCE

This is a product category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

Failure to follow these instructions can result in equipment damage.

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.
- 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 mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- The UPS must be properly earthed/grounded and due to a high touch current/leakage current, the earthing/grounding conductor must be connected first.
- This product has a leakage (touch) current greater than 3.5 mA. If the protective ground connection is interrupted, a hazardous leakage (touch) current may flow if the housing is touched.
- The minimum size PE conductor shall comply with the local safety regulations for high PE conductor current equipment.

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.

NOTICE

If a residual current-operated protective device (RCD-B) is used upstream as ground fault protection, then the RCD-B shall be sized to not trip on the leakage current of this product, which can be up to 116 mA.

Failure to follow these instructions can result in 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**

- Mount the batteries in the UPS system, but do not connect the batteries until the UPS system is ready to be powered up. The time duration from battery connection until the UPS system is powered up must not exceed 72 hours or 3 days.
- 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.

Specifications

All below values are based on 96 kW and 160 kW maximum configurations. If the cables and current protection are configured for a 96 kW system, only six power modules must be installed in the system. To upgrade to a 160 kW system, a redimensioning of cables and current protections is required.

NOTE: All electrical power and power control wiring must be installed by a qualified electrician, and must comply with local and national regulations for maximum power rating.

Input Specifications

	96 kW			160 kW		
	380 V	400 V	415 V	380 V	400 V	415 V
Connection type	3PH + N + PE ¹					
Input frequency (Hz)	40–70					
Total harmonic distortion (THDI)	< 5% at full load					
Nominal input current (A) ²	154	146	141	256	243	234
Maximum input current (A) ³	169	160	155	287	268	258
Input current limitation (A) ⁴	197	197	197	295	295	295
Minimum short circuit current rating	Dependent on upstream protection. See section Required Upstream and Downstream Protection for details.					
Input power factor correction	> 0.98 at load > 50%					
Maximum short circuit level I _{cc} (kA)	Rated conditional short-circuit current I _{cc} : 30 kA. Rated peak withstand current I _{pk} : I _{cc} x 1.7.					

Bypass Specifications

	96 kW			160 kW		
	380 V	400 V	415 V	380 V	400 V	415 V
Connection type	3PH + N + PE ¹					
Input frequency (Hz)	40–70					
Nominal input current (A)	147	139	134	248	236	227
Minimum short circuit current rating	Dependent on upstream protection. See section Required Upstream and Downstream Protection for details.					
Maximum short circuit level I _{cc} (kA)	Rated conditional short-circuit current I _{cc} : 30 kA. Rated peak withstand current I _{pk} : I _{cc} x 1.7.					

1. TN, TT, and IT power distribution systems with no earthed line conductors are supported.
2. Input current is based on nominal voltage and rated load, batteries fully charged
3. Input current is based on nominal voltage, rated load and full battery charge current.
4. Integrated electronic current limitation functionality.

Output Specifications

	96 kW			160 kW		
	380 V	400 V	415 V	380 V	400 V	415 V
Connection type	3PH + N + PE					
Output capacity	150% for 60 seconds (normal operation) 125% for 10 minutes (normal operation) 150% for 60 seconds (battery operation) 125% for 10 minutes (battery operation) 100% load (bypass operation) 1000% for 100 ms (bypass operation)					
Nom output current (A)	147	139	134	248	236	227
Output frequency (sync to bypass)	47–53 Hz for 50 Hz nominal ⁵					
Slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, and 6					
Total harmonic distortion (THDU)	< 2% linear < 5% non-linear					
Output power factor	0.5 leading to 0.5 lagging without derating					
Dynamic load response	+/- 5%					
Output voltage regulation	+/- 1%					
Crest factor	2.7					
Minimum short circuit current rating	Dependent on upstream protection. See section Required Upstream and Downstream Protection for details.					
Maximum short circuit level I _{cc} (kA)	Rated conditional short-circuit current I _{cc} : 30 kA. Rated peak withstand current I _{pk} : I _{cc} x 1.7.					

5. The following options can be selected: 40–60 Hz, 47–53 Hz, 49.9–50.1 Hz.

Required Upstream and Downstream Protection for Building Installation

The specified upstream breakers below are required to obtain the conditional short-circuit current rating, I_{cc} at 30 kA symmetrical rms.

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Circuit breakers must have instantaneous trip time of maximum 60 ms.
- Circuit breakers must have instantaneous override values set according to the table below.

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

Single and Dual Mains Systems

Input and Bypass

With Breaker PowerPact NLGF36400U3XTW

	96 kW		160 kW	
	Input	Bypass	Input	Bypass
Trip setting	96 kW	96 kW	160 kW	160 kW
I _r (A)	225	160	400	250
I _r (@ 6 I _r) ⁶	0.5–16	0.5–16	0.5–16	0.5–16
I _i (x I _n)	1.5–12	1.5–12	1.5–12	1.5–12

Output

	96 kW 400 V		160 kW 400 V	
	Fuse	Breaker (A)	Fuse	Breaker (A)
Battery breaker (max value) ⁷	—	550	—	550
UPS output Q2	160 A gL type fuse	160	250 A gL type fuse	250

Modular Battery Specifications

NOTE: The batteries must be connected to a DC rated circuit breaker.

Battery Type	Sealed lead–acid
Nominal voltage (VDC)	+/- 192 (96 cells at 2 V)
Float voltage (VDC)	+/- 218 (96 cells at 2.27 V)
End of discharge voltage at full load (VDC)	+/- 154 (96 cells at 1.6 V)

6. I_r and I_{sd} must be set by the installer based on the installation coordination
 7. For more information see Install the Classic Battery Solution, page 74.

Battery Type	Sealed lead-acid
End of discharge maximum battery current (A)	96 kW: 332 160 kW: 550
Maximum charging power ⁸	96 kW: 9.6/19.2 kW (selected via the display) 160 kW: 16/32 kW (selected via the display)

NOTE: Battery specifications are based on VRLA batteries.

8. Input current limit may lower charging capability in some line and load conditions.

Classic Battery Specifications

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Do not mix battery types in the same installation.

Failure to follow these instructions can result in equipment damage.

Pre-installed batteries	XP12V1800	XP12V2500
Battery Type	Sealed lead-acid	
Nominal voltage (V)	12	12
Power ⁹	1370	1870
Nominal capacity ¹⁰	56.4	69.5
Internal resistance (mOhm)	8.6	6.2
Short circuit current (A)	1521	2030

DC Power Levels for Battery Sizing with Output Power Factor = 1

DC power in kW				
Load	25%	50%	75%	100%
32 kVA	8.5	16.9	25.4	33.9
64 kVA	16.9	33.9	50.8	67.7
96 kVA	25.4	50.8	76.2	101.6
128 kVA	33.9	67.7	101.6	135.4
160 kVA	42.3	84.7	127.0	169.3

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

DC power in kVA				
Load	25%	50%	75%	100%
32 kVA	6.8	13.5	20.3	27.1
64 kVA	13.5	27.1	40.6	54.2
96 kVA	20.3	40.6	61.0	81.3
128 kVA	27.1	54.2	81.3	108.4
160 kVA	33.9	67.7	101.6	135.4

Maximum Current with Battery at End of Discharge (A)

Load	25%	50%	75%	100%
32 kW	27.6	55.1	82.7	110.2
64 kW	55.1	110.2	165.3	220.5

9. 15 min 1.60 VDC 25 °C W/block
 10. C₁₀ 1.80 VDC 25 °C Ah

96 kW	82.7	165.3	248.0	330.7
128 kW	110.2	220.5	330.7	440.9
160 kW	137.8	275.6	413.4	551.1

Environmental

	Operation	Storage
Temperature	0 to 40° C	-15 to 40° C
Relative Humidity	0 - 95%	0 - 95%
Elevation	0-1000 m: 100% load 1000-1500 m: 95% load 1500-2000 m: 91% load 2000-2500 m: 86% load 2500-3000 m: 82% load	0-15000 m
Audible noise at 1 meter from surface of unit	63.00 dBA	
Protection Class	NEMA 1	
Colour	Black	

Heat Dissipation

NOTE: Full load heat loss at nominal mains and fully charged batteries.

UPS rating	32 kW	64 kW	96 kW	128 kW	160 kW
Heat dissipation kWh (BTU/hr)	1.68 (5748)	3.37 (11496)	5.05 (17244)	6.73 (22992)	8.42 (28741)

Torque Specifications

Power terminals in UPS	26 Nm (230 lbf-in)
Power terminals in PDU with modular batteries	62 Nm (550 lbf-in)
Power terminals in modular battery cabinet	31 Nm (274 lbf-in)

Recommended Cable, Bolt and Lug Sizes

NOTE: All wiring must comply with all applicable local and/or national electrical codes.

The recommended cable sizes are based on an environment with an ambient temperature of 30 °C (86 °F) .

Temperature of the conductors: 90 °C (104 °F).

Refer to IEC 60364-5-52 for installation methods. The cable sizes are recommendations for maximum configurations and copper cables.

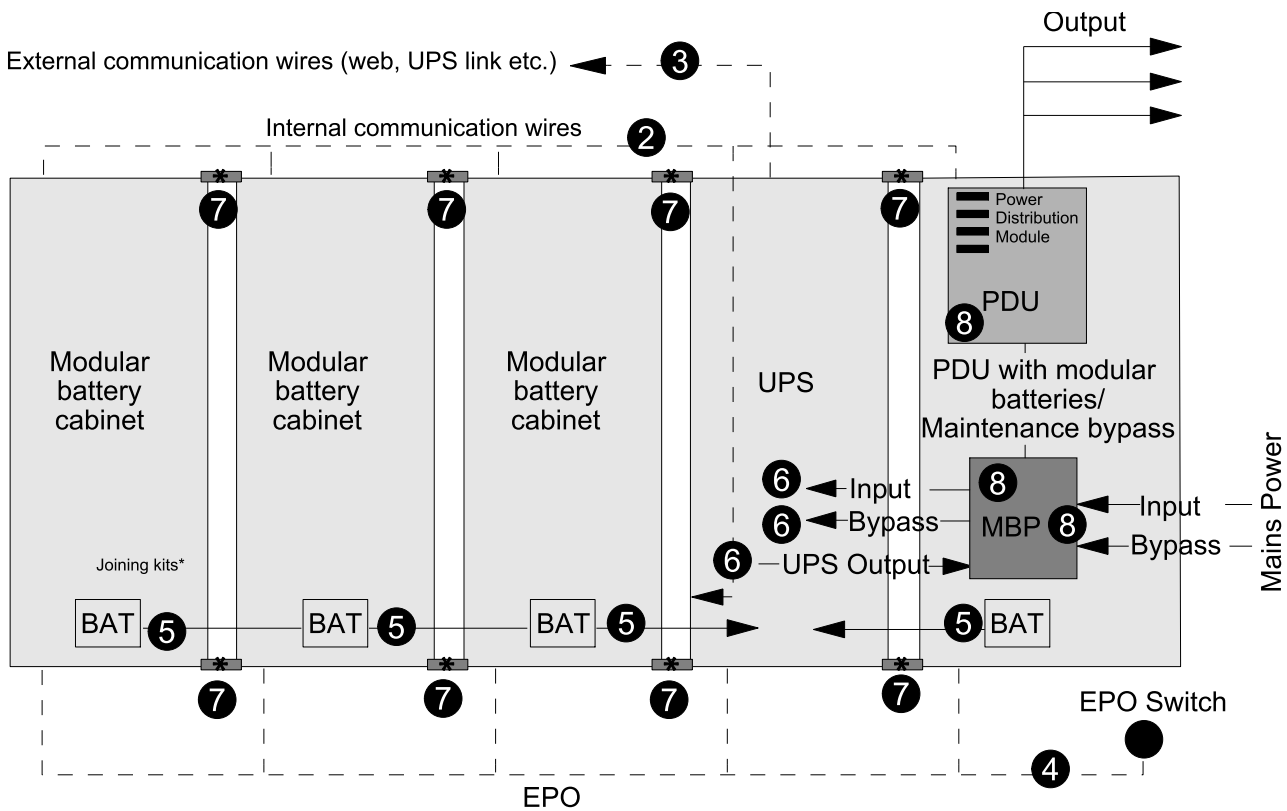
Cable	Terminal bolt diameter	Cable size	Cable lug type
Input	M10	2 x 120 mm ²	LCA4/0-12H-X
Bypass	M10	250 mm ²	LCA500-12H-X

Cable	Terminal bolt diameter	Cable size	Cable lug type
Battery 1	M10	150 mm ²	LCA300-12H-X
Battery 2	M10	150 mm ²	LCA300-12H-X
Output	M10	250 mm ²	LCA500-12H-X

Compliance

Safety	IEC 62040-1: 2017, Edition 2.0, Uninterruptible Power Systems (UPS) - Part 1: Safety requirements
Safety for MBP	IEC 61439-1: 2020, Edition 3.0, Low-voltage switchgear and control gear assemblies - Part 1: General rules IEC 61439-2: 2020, Edition 3.0, Low-voltage switchgear and control gear assemblies - Part 2: Power switchgear and controlgear assemblies
EMC/EMI/RFI	IEC 62040-2: 2016-11, 3rd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements C3
Performance	Performance in accordance with: IEC 62040-3: 2011 Uninterruptible Power Systems (UPS). Method of specifying the performance and test requirements. 2001 Classifications: VFI-SS-111
Transportation	ISTA 2B (2006)
Seismic	SE CoC in accordance with AC 156 protocol
Earthing system	TN, TT, IT
Overvoltage category	This UPS is OVCII compliant.
Protective class	I
Pollution degree	2

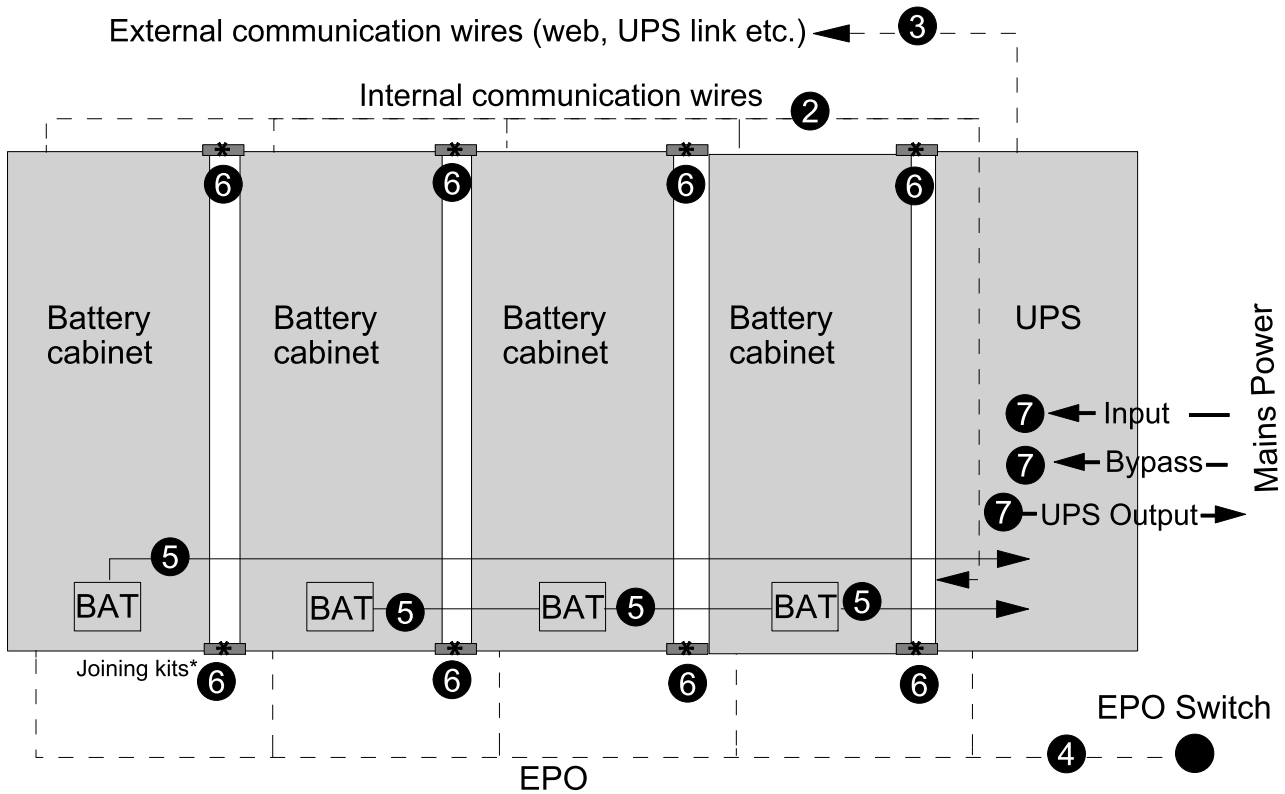
Installation Procedure for System with PDU with Modular Batteries



1. Mechanical Assembly, page 20 (not shown on the drawing).
 - a. Rearrange the Side Panels, page 20.
 - b. Prepare the PDU with Modular Batteries for Cables, page 27.
2. Connect the Battery Breaker Trip Cables and Communication Cables in Installations with UPS and PDU with Modular Batteries, page 31.
3. Connect the Network Communication Cable, page 37.
4. Connect the Emergency Power Off (EPO) Switch, page 38.
5. Install the Modular Battery Solution, page 70.
6. Connect Power Cables Between the UPS and the PDU with Modular Batteries, page 41.
7. Interconnect the Cabinets, page 44 and Level the Cabinets, page 45.
8. Connect Power Cables in Installations with UPS and PDU with Modular Batteries, page 46.

NOTE: Input neutral is always ON. Input neutral is never switched OFF when Q1 circuit breaker is switched ON or OFF. A continuous grounded neutral must be connected to the input of the UPS. This connection ensures that the UPS neutral remains grounded while in battery operation mode. Operation of the UPS in battery mode without the continuously grounded neutral can result in excessive voltage potentials between ground and line voltage. This excessive voltage potential could lead to damage to externally connected equipment. The neutral connection to the load is switched when operating Q2 and Q3.

Installation Procedure for Systems with UPS and Modular or Classic Batteries



1. Mechanical Assembly, page 20¹¹ (not shown on the drawing)
 - a. Rearrange the Side Panels, page 20.
 - b. Prepare the UPS for Cables, page 21.
2. Connect the Battery Breaker Trip Cables and the Communication Cables in Installations With UPS and Modular Battery Cabinets, page 34¹²
3. Connect the Network Communication Cable, page 37.
4. Connect the Emergency Power Off (EPO) Switch, page 38.
5. Install your battery solution:
 - Install the Modular Battery Solution, page 70
 - Install the Classic Battery Solution, page 74
6. Interconnect the Cabinets, page 44 and Level the Cabinets, page 45¹³
7. Connect Power Cables in Systems with UPS and Modular Battery Cabinets or Classic Battery Cabinets, page 57.

11. Note that for classic battery cabinets, rearranging of side panels is not necessary

12. Note that for classic battery cabinet, battery signal cables are connected at a later time

13. Only modular battery cabinets must be interconnected with the other cabinets. Classic battery cabinets only need to be levelled

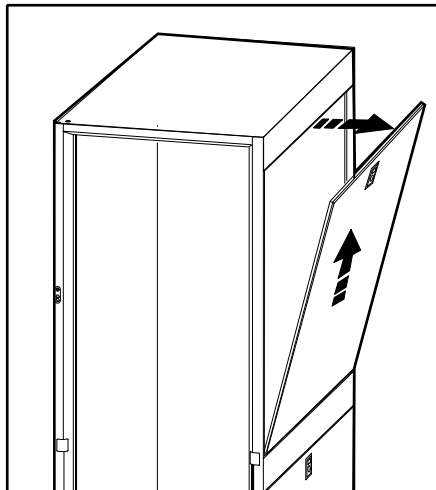
Mechanical Assembly

Rearrange the Side Panels

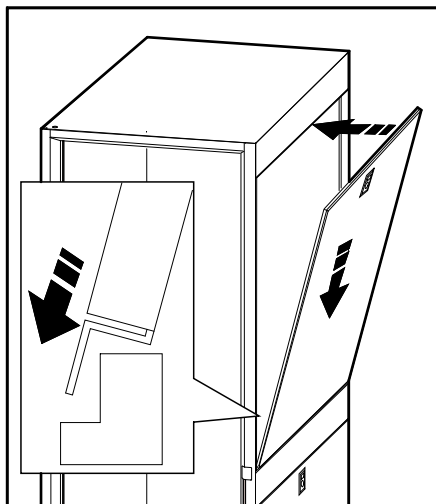
NOTE: Only systems installed on a raised floor can use bottom cable entry.

NOTE: For systems with classic battery cabinets, rearranging the side panels is not necessary.

1. Rearrange the side panels depending on your configuration:
 - **System with UPS and PDU with modular batteries:** Remove the side panels on both sides of the UPS and install one of the side panels on the last modular battery cabinet in the row, and the other side panel on the open side of the PDU with modular batteries.
 - **System with UPS and line-up modular battery cabinets:** Remove the side panel from the UPS from the side placed up against the modular battery cabinet and install it on the last modular battery cabinet in the row.
 - **System with UPS and remote modular battery cabinets:** Leave the side panels on the UPS. The extra side panels are needed for the open side of the modular battery cabinets.
2. To remove the side panels, unlock the side panels with the key (provided). Press down on the lock and then pull out and up.



3. To install the side panels, set the base of the panel at an angle and push the panel in. Lock the side panels with the key



Prepare the UPS for Cables

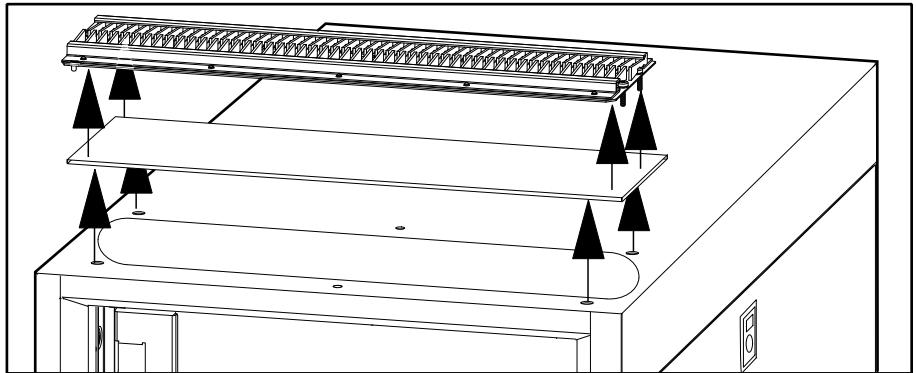
There are four ways of routing the cables. Follow the procedure applicable to your installation:

- Prepare the UPS for Cables in Top Cable Entry Systems without Conduits, page 22.
- Prepare the UPS for Cables in Top Cable Entry Systems with Conduits, page 21.
- Prepare the UPS for Cables in Bottom Cable Entry Systems without Conduits, page 23.
- Prepare the UPS for Cables in Bottom Cable Entry Systems with Conduits, page 24.

Prepare the UPS for Cables in Top Cable Entry Systems with Conduits

1. Remove the brush slot plate and the gland plate.

Rear View of the UPS



2. Drill as many holes as needed in the gland plate and install the conduits.

⚠ DANGER

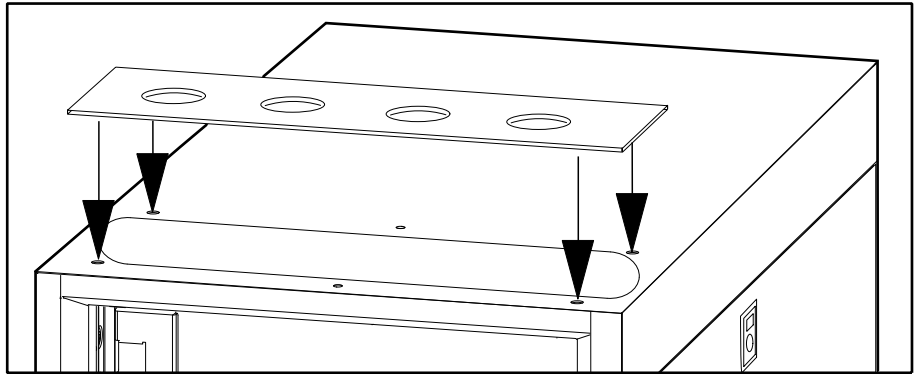
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or cut holes for cables or conduits with the gland plate 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.

3. Reinstall the gland plate.

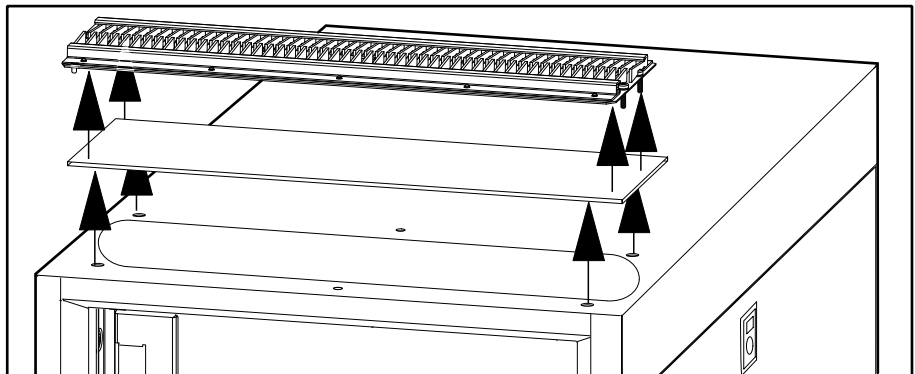
Rear View of the UPS



Prepare the UPS for Cables in Top Cable Entry Systems without Conduits

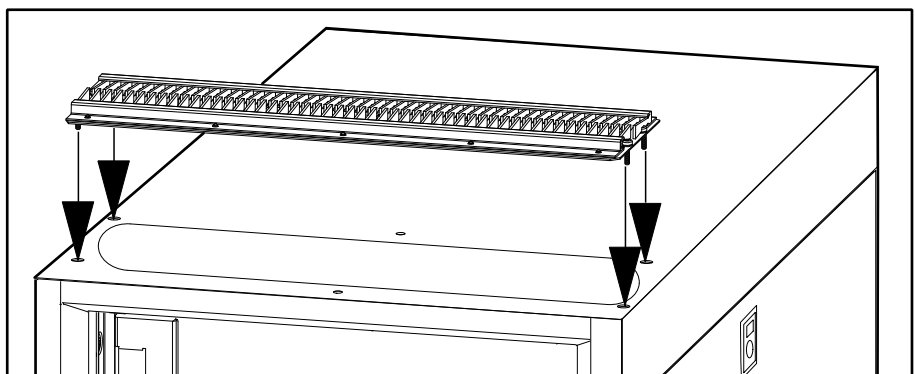
1. Remove the brush slot plate and the gland plate.

Rear View of the UPS



2. Reinstall the brush slot plate.

Rear View of the UPS



Prepare the UPS for Cables in Bottom Cable Entry Systems without Conduits

⚠ CAUTION

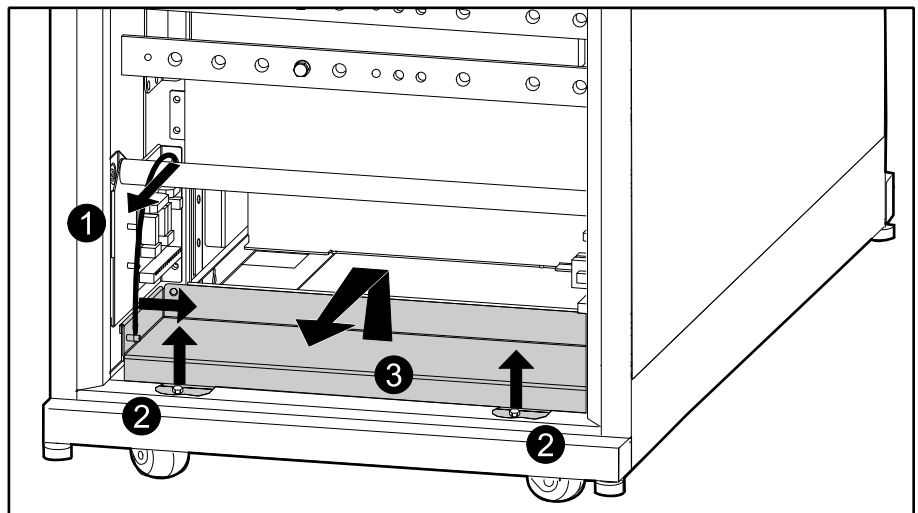
HAZARD OF RODENT DAMAGING EQUIPMENT

In areas with risk of rodent infestation, make holes in the bottom plate, reinstall the bottom plate, and route cables through the plate. Ensure that there are no sharp edges that can damage the cables.

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

1. Remove the grounding cable.
2. Remove the screws in front of the bottom plate.
3. Lift the bottom plate to remove it.

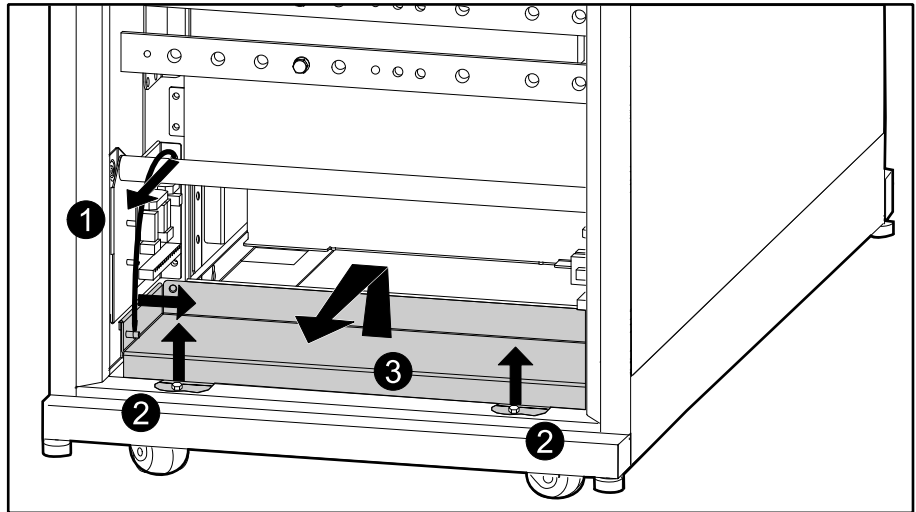
Rear View of the UPS



Prepare the UPS for Cables in Bottom Cable Entry Systems with Conduits

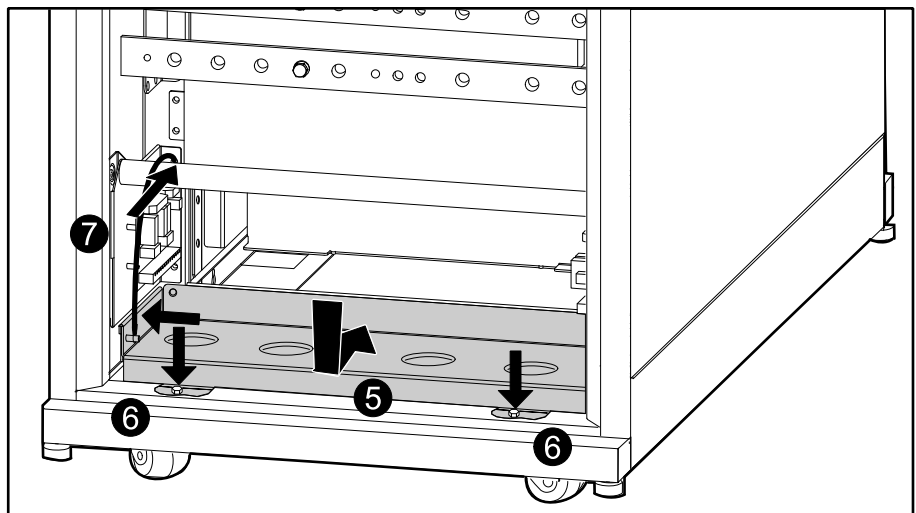
1. Remove the grounding cable.
2. Remove the screws in front of the bottom plate.
3. Lift the bottom plate to remove it.
4. Drill holes in the bottom plate and install the conduits.

Rear View of the UPS



5. Reinstall the bottom plate with the conduits installed.
6. Reinstall the screws in front of the bottom plate
7. Reinstall the grounding cable. The required torque value is 8 Nm.

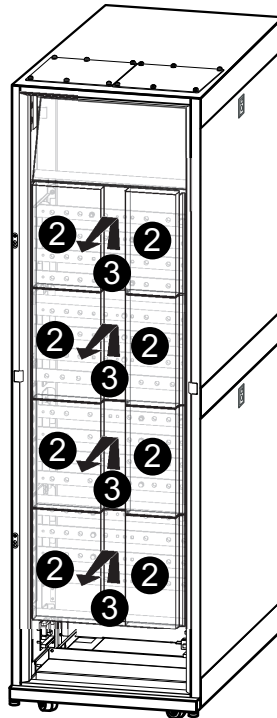
Rear View of the UPS



Access the Cable Connection Area in the UPS

1. Open the rear door of the UPS.
2. Remove all four covers, starting from the top, by loosening the two screws in each cover.
3. Lift the cover up and out.

Rear View of the UPS

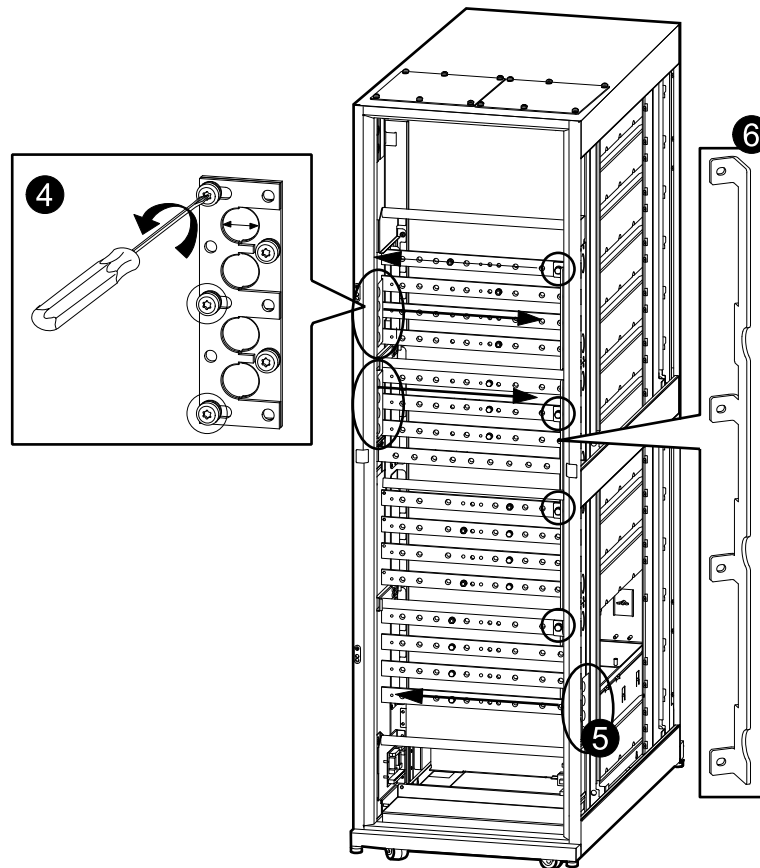


NOTE: The following steps are only applicable to systems with the PDU with modular batteries placed to the left of the UPS.

4. Remove the three cable reliefs from the left side and save for later.
5. Remove the neutral busbar from the right side of the UPS by loosening the four bolts and mount the busbar on the left side of the UPS.

6. Mount the cable reliefs (removed earlier) on the right side.

Rear view of the UPS



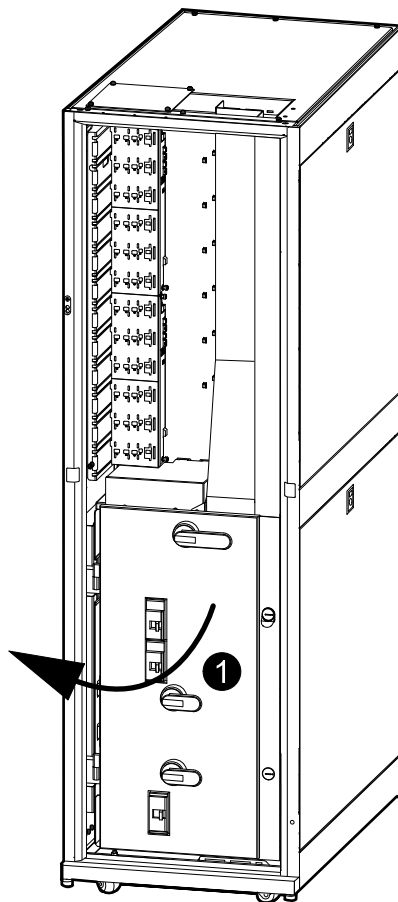
Prepare the PDU with Modular Batteries for Cables

- Prepare the PDU with Modular Batteries for Cables in Top Cable Entry Systems, page 28.
- Prepare the PDU with Modular Batteries for Cables in Bottom Cable Entry Systems with Front Cable Entry without Conduits, page 29.
- Prepare the PDU with Modular Batteries for Cables in Bottom Cable Entry Systems with Front Cable Entry with Conduits, page 29.

Access the Cable Connection Area of the PDU with Modular Batteries

1. Open the dead front in the PDU with modular batteries.

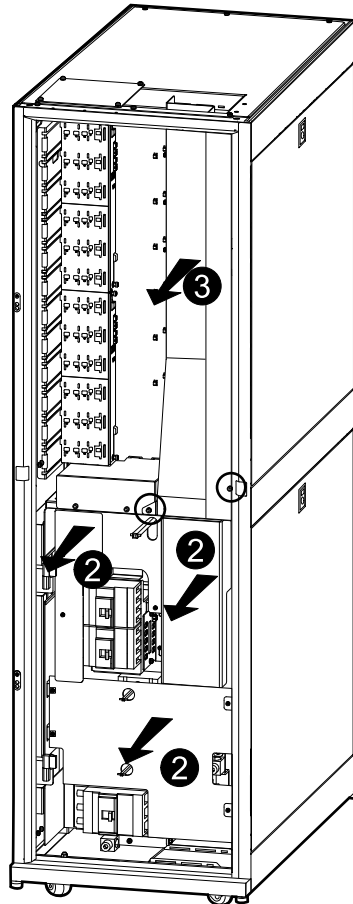
Front View of the PDU with Modular Batteries



2. Remove the three blanking panels.

3. Remove the two bolts at the bottom of the cable channel and remove the cable channel.

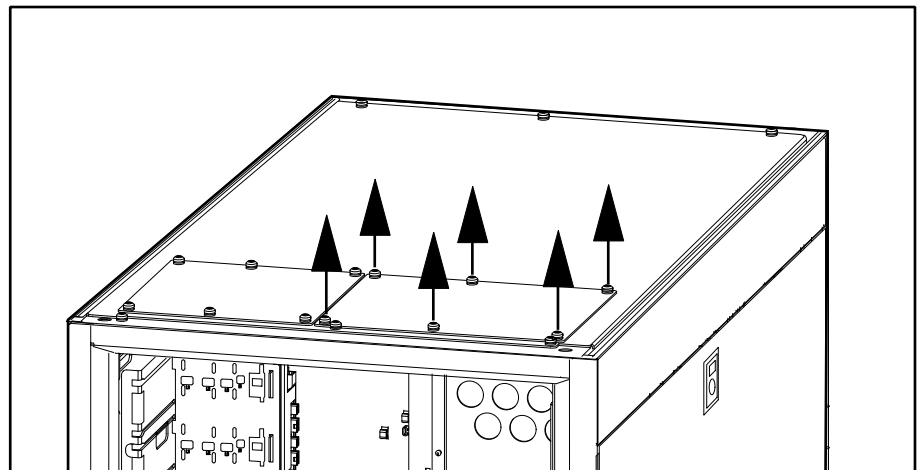
Front View of the PDU with Modular Batteries



Prepare the PDU with Modular Batteries for Cables in Top Cable Entry Systems

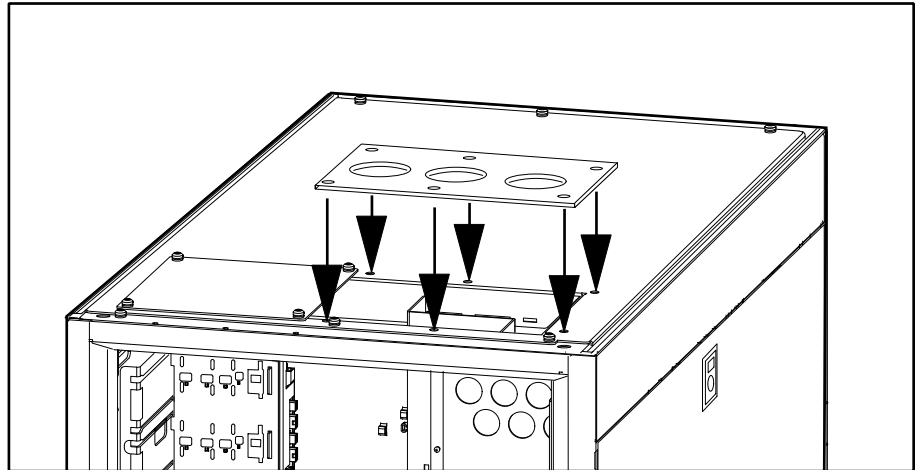
1. Remove the dedicated cover plate. Continue with step 2 if you are using conduits.

Front View of the PDU with Modular Batteries



2. Drill holes in the top plate and install the conduits.

Front View of the PDU with Modular Batteries

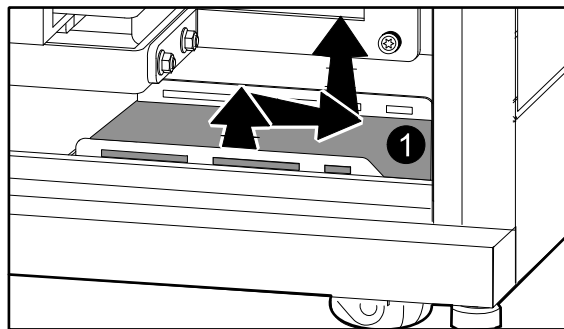


3. Reinstall the top plate with the conduits installed.

Prepare the PDU with Modular Batteries for Cables in Bottom Cable Entry Systems with Front Cable Entry without Conduits

1. Loosen the bolts and remove the plate by lifting it up and to the right.

Front View of the PDU with Modular Batteries

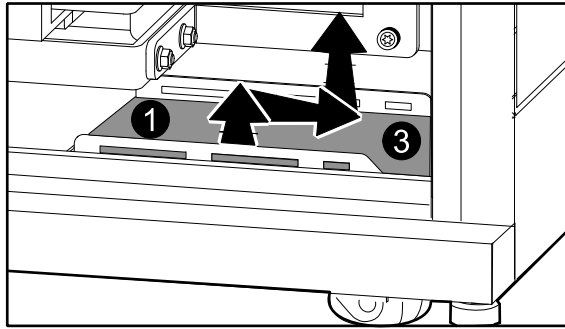


Prepare the PDU with Modular Batteries for Cables in Bottom Cable Entry Systems with Front Cable Entry with Conduits

1. Remove the bolts. Remove the plate by lifting it up and to the right.
2. Drill holes in the bottom plate for conduits.

3. Reinstall the bottom plate with the conduits installed.

Front View of the PDU with Modular Batteries



Connect the Communication Cables

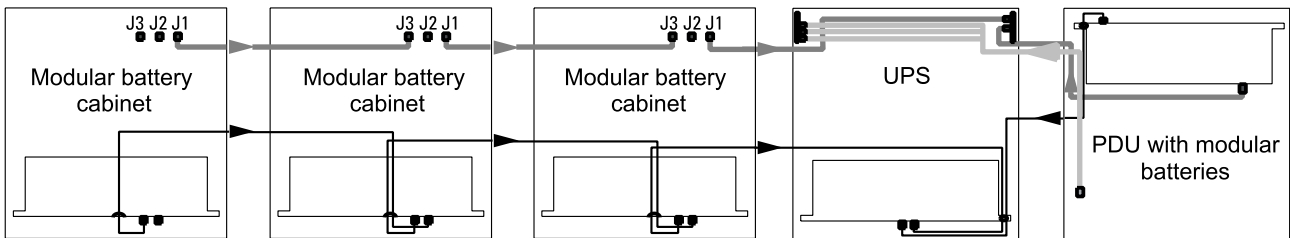
Follow one of the below procedures:

- Connect the Battery Breaker Trip Cables and Communication Cables in Installations with UPS and PDU with Modular Batteries, page 31.
- Connect the Battery Breaker Trip Cables and the Communication Cables in Installations With UPS and Modular Battery Cabinets, page 34

Connect the Battery Breaker Trip Cables and Communication Cables in Installations with UPS and PDU with Modular Batteries

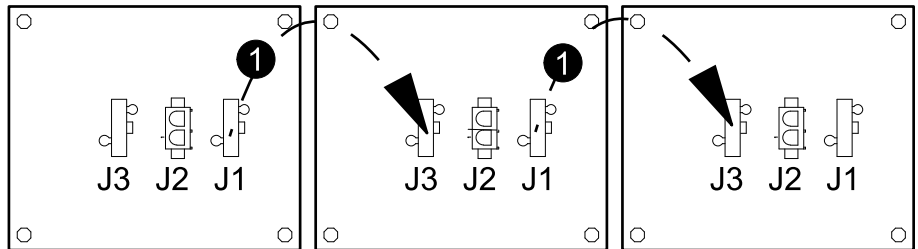
Move the cabinets just close enough so that the communication cables can reach between them. The cabinets should not be positioned too close to one another. The extra space is needed to complete the wiring.

Overview of the Communication Cables



Front

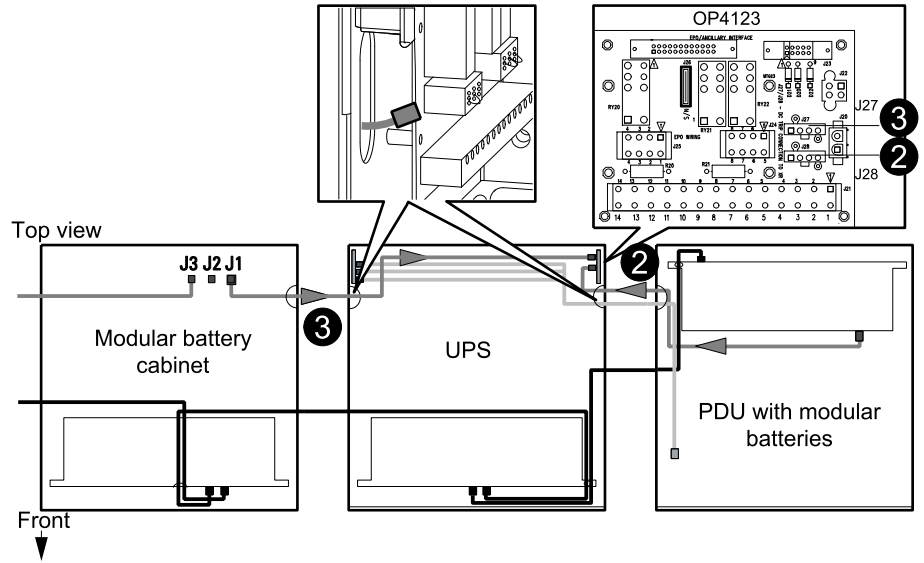
1. Route the battery breaker trip cable from J1 in the first modular battery cabinet to the J3 port in the next modular battery cabinet. Repeat the procedure for all modular battery cabinets.



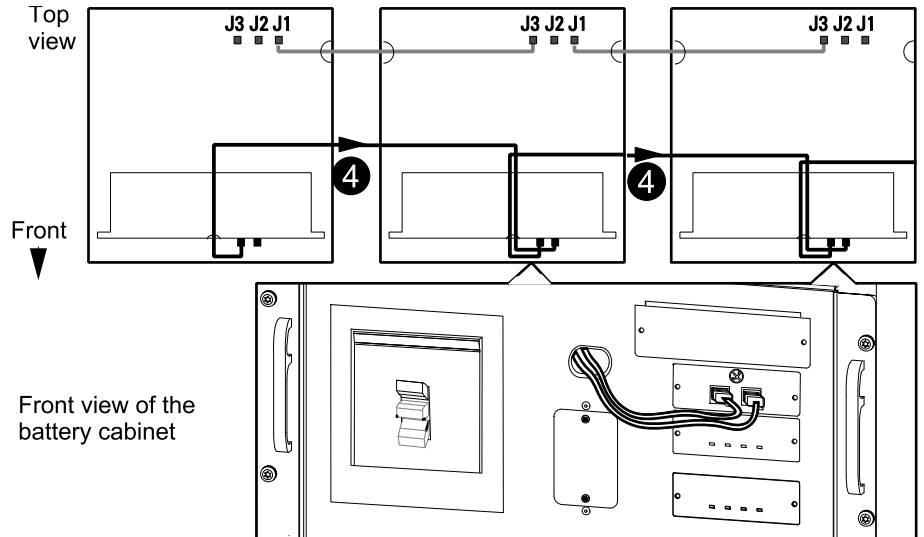
2. Route the battery breaker trip cable from the PDU with modular batteries to J28 on the EPO/ancillary interface board (0P4123) in the UPS.

NOTE: When the UPS is installed in environments sensitive to interference, the EMC kit with three ferrite cores must be installed with three loops. Add a clip on ferrite for high frequency noises. Use kit 0J-9147.

- Route the battery breaker trip cable from J1 in the last modular battery cabinet to J27 on the EPO/ancillary interface board (0P4123) in the UPS.

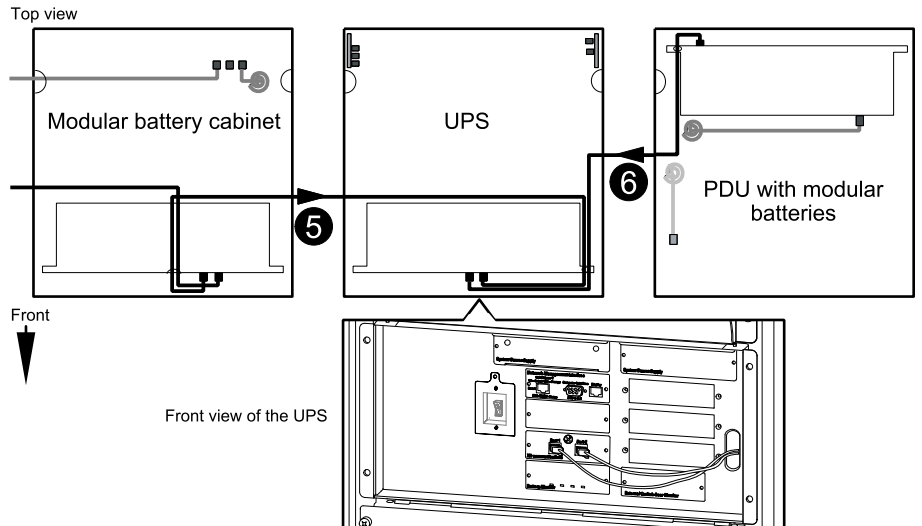


- Route the communication cable from XR Communications port 1 in each modular battery cabinet to port 2 in the next modular battery cabinet. Remove the terminator when necessary.

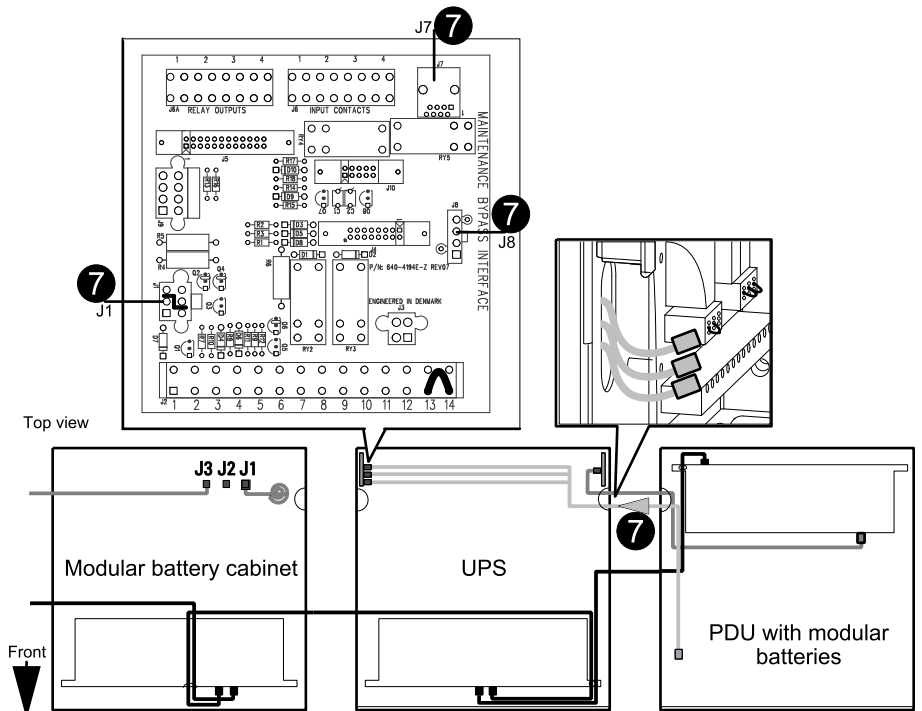


- Route the communication cable from XR Communications port 1 on the last modular battery cabinet in the row to XR Communications port 2 on the UPS.

- Route the communication cable from XR Communications port 2 on the PDU with modular batteries to XR Communications port 1 on the UPS.



- Route the three PDU communication cables from the PDU with modular batteries to J7, J8, and J1 on the maintenance bypass interface board (0P3199) in the UPS.

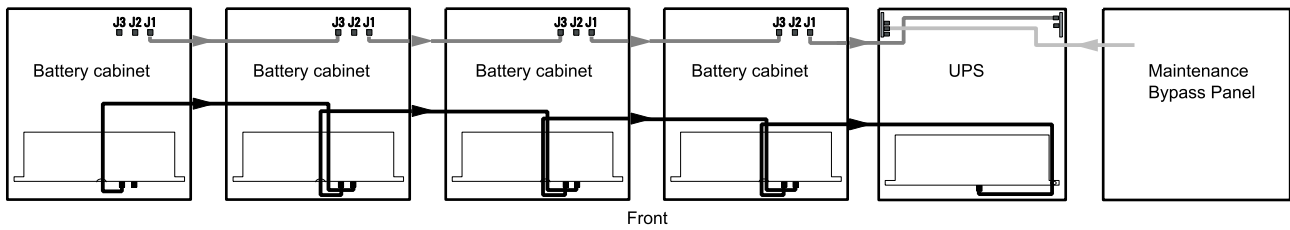


Connect the Battery Breaker Trip Cables and the Communication Cables in Installations With UPS and Modular Battery Cabinets

NOTE: Communication cables for classic battery cabinets are connected later in *Connect the Signal Cables with Only One Classic Battery Cabinet Installed*, page 80 and *Connect the Signal Cables with Multiple Classic Battery Cabinets Installed*, page 83.

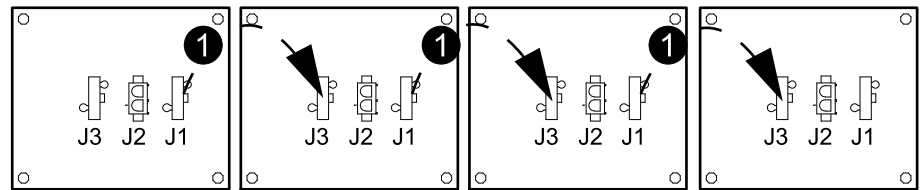
Move the cabinets just close enough so that the communication cables can reach between them. The cabinets should not be positioned too close to one another. The extra space is needed to complete the wiring.

Overview of the Communication Cables



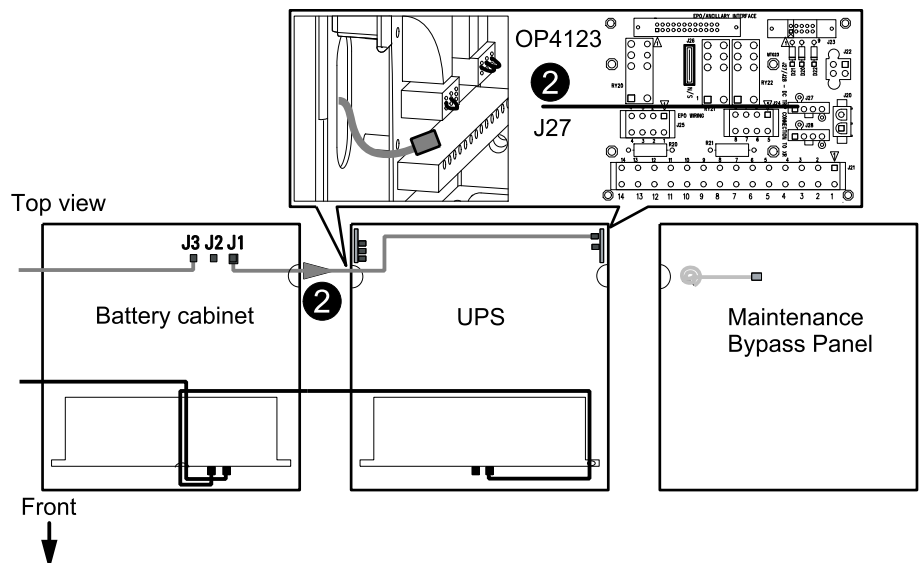
1. Route the battery breaker trip cable from J1 in the first modular battery cabinet to J3 in the next modular battery cabinet. Repeat the procedure for all modular battery cabinets.

Rear View of the Modular Battery Cabinets

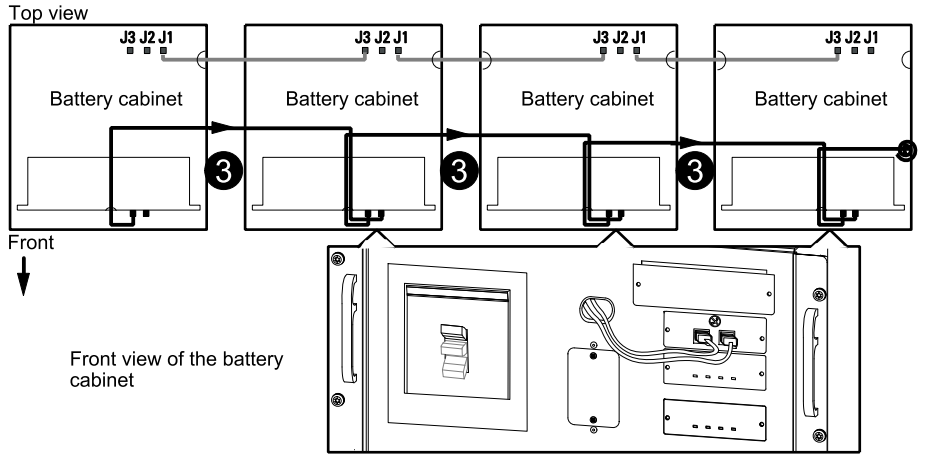


2. Route the battery breaker trip cable from J1 in the last modular battery cabinet to J27 on the EPO/ancillary interface board (OP4123) in the UPS.

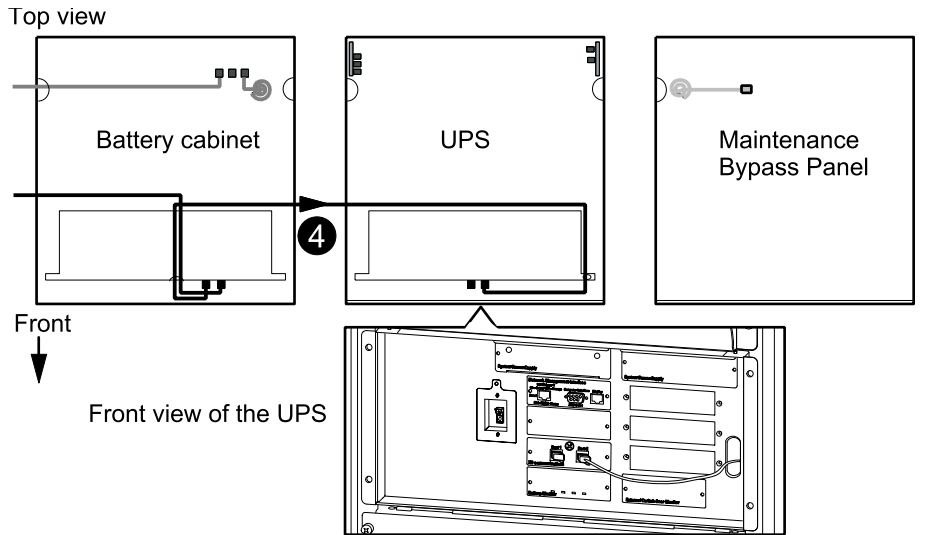
NOTE: When the UPS is installed in environments sensitive to interference, the EMC kit with three ferrite cores must be installed with three loops. Add a clip on ferrite for high frequency noises. Use kit 0J-9147.



- Route the communication cable from XR Communications port 1 in each modular battery cabinet to port 2 in the next modular battery cabinet. Remove the terminator when necessary.

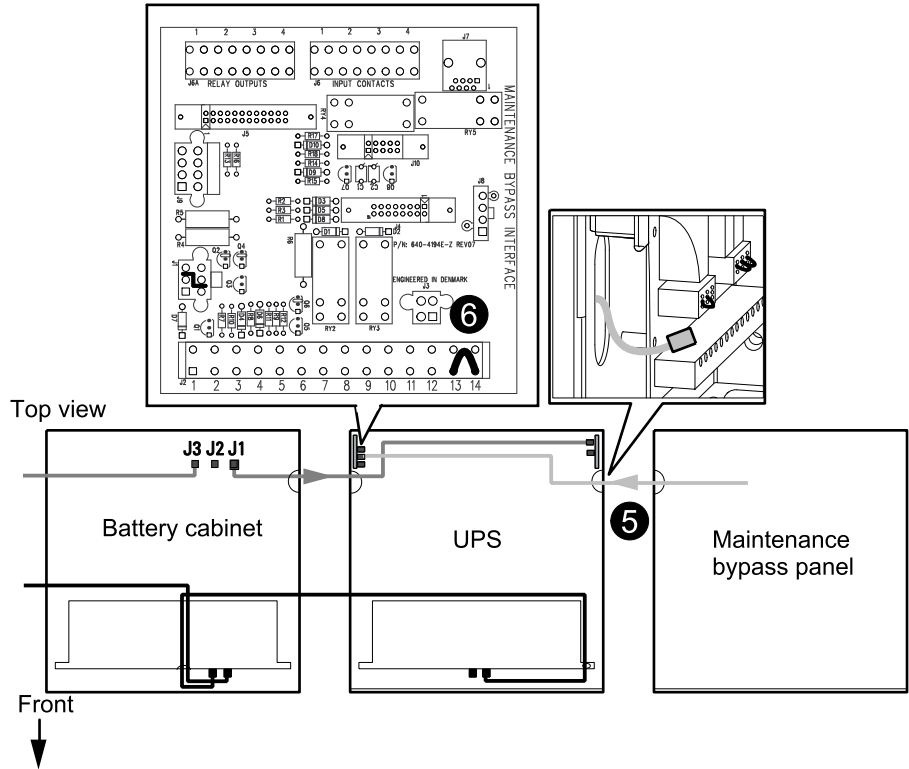


- Route the communication cable from XR Communications port 1 in the last modular battery cabinet to the UPS XR Communications port 2.



- Route the communication cables from the maintenance bypass panel to the maintenance bypass interface board (0P3199) in the UPS.

NOTE: When the UPS is installed in environments sensitive to interference, the EMC kit with three ferrite cores must be installed with three loops. Add a clip on ferrite for high frequency noises. Use kit 0J-9147.

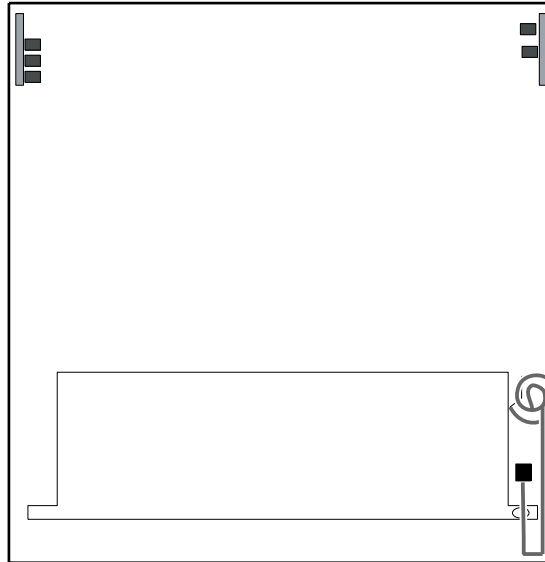


- For third party switchgear without surveillance, remove the jumper between pins 13 and 14 of J2. For switchgear with surveillance connected to the maintenance bypass interface board, leave the jumper installed.

Connect the Network Communication Cable

1. The network communication cable (supplied) has been preconnected to the UPS and is located on the top of the UPS cabinet. Connect the network communication cable to your local area network.

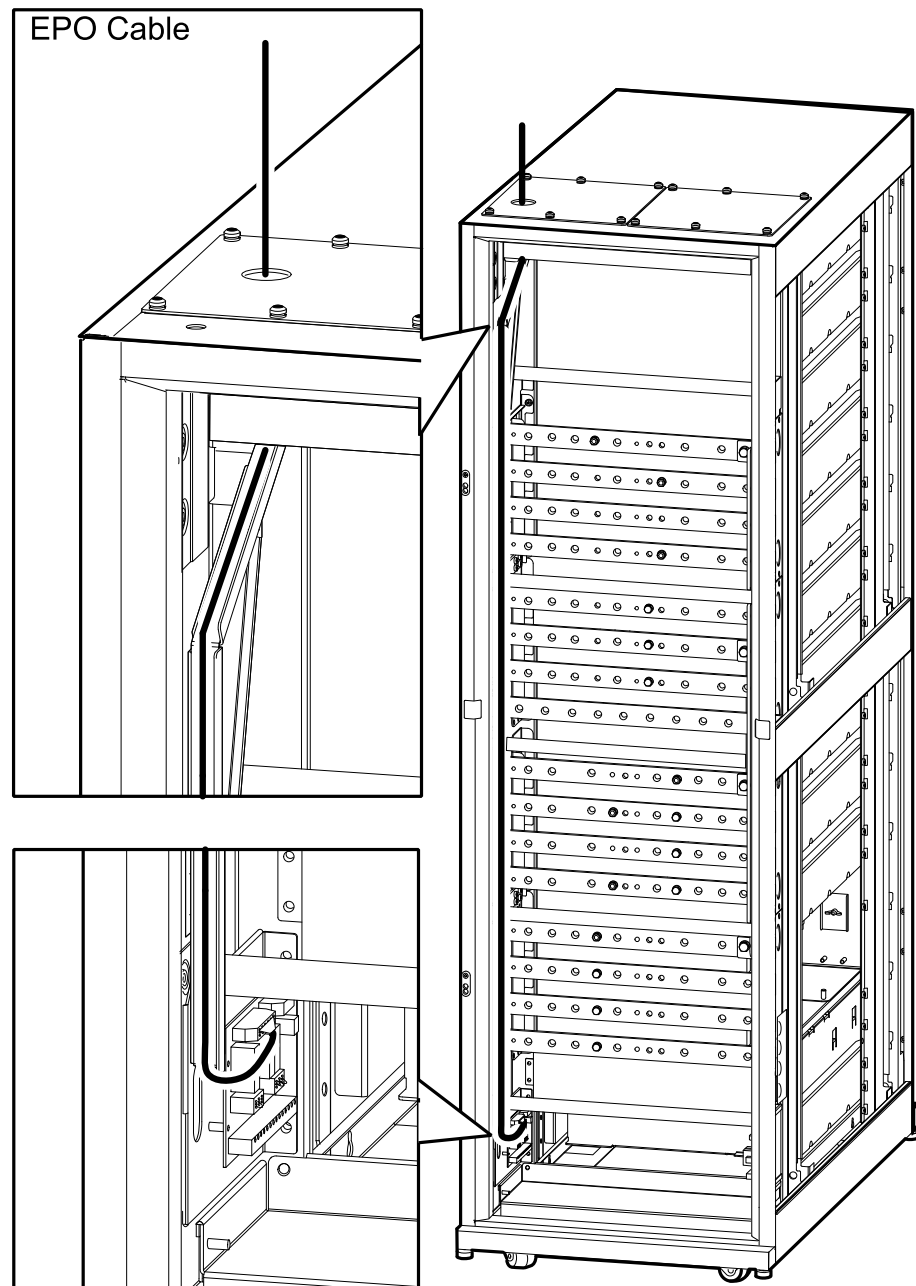
Top View of the UPS



Front

Connect the Emergency Power Off (EPO) Switch

Rear View of the UPS



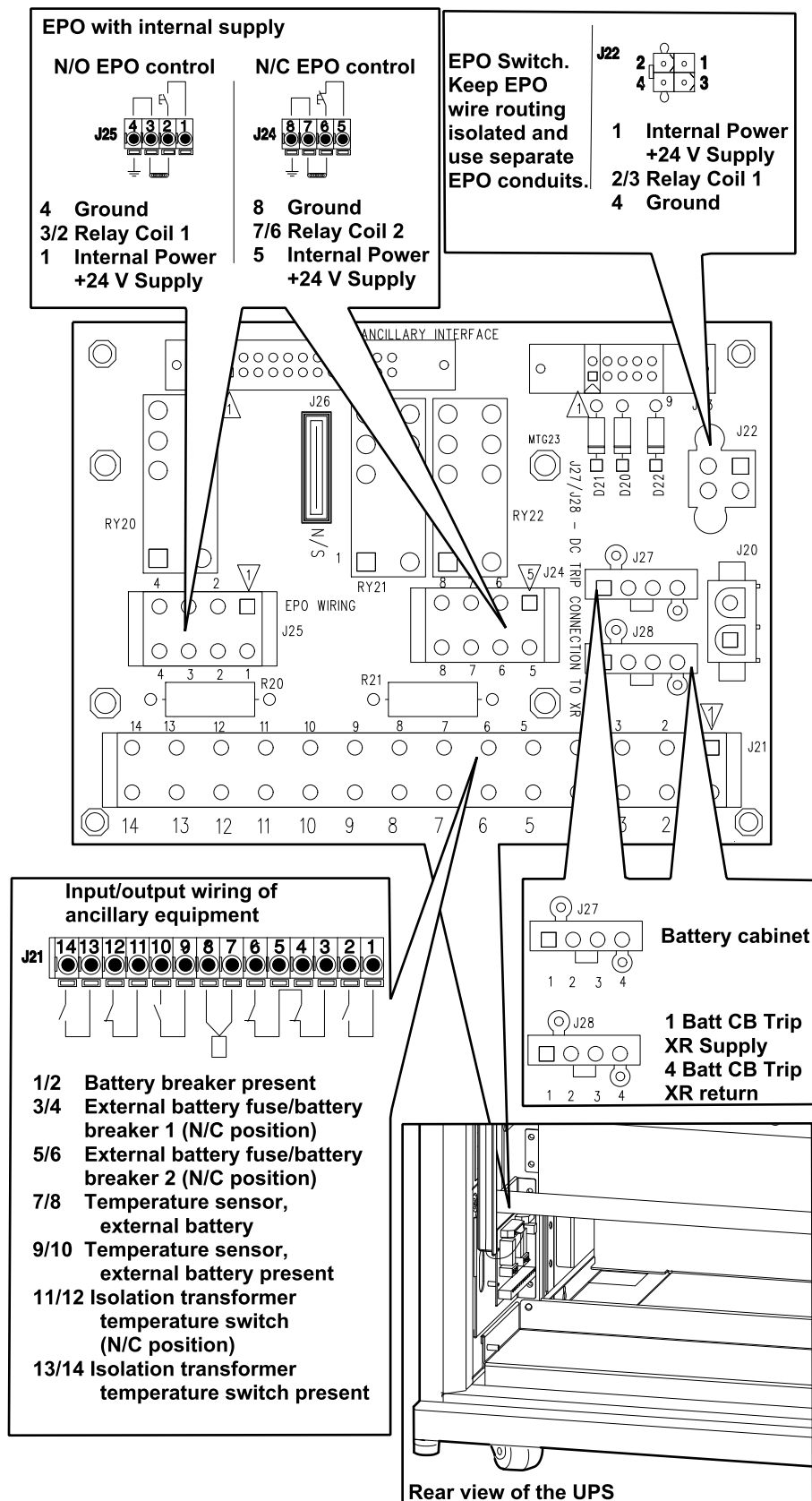
The UPS must be connected to either a dry contact or an external 24 VDC source.

EPO can be achieved with either a contact closure or application of an external 24 VDC from a SELV (Safety Extra Low Voltage) source. It is important to note that hazardous voltage from the mains must be isolated from the contact closure or 24 VDC. The EPO circuit contact closure or 24 VDC is considered a SELV circuit as defined in EN60950-1 "Safety of Information Technology Equipment". SELV circuits are isolated from the mains through a safety isolating transformer, and designed so that, under normal conditions, the voltage is limited to 42.4 V peak or 60 VDC.

NOTE: EPO switch wiring must comply with local and national electrical wiring rules.

NOTE: When the UPS is installed in environments sensitive to interference, the EMC kit with three ferrite cores must be installed with three loops. Add a clip on ferrite for high frequency noises. Use kit 0J-9147.

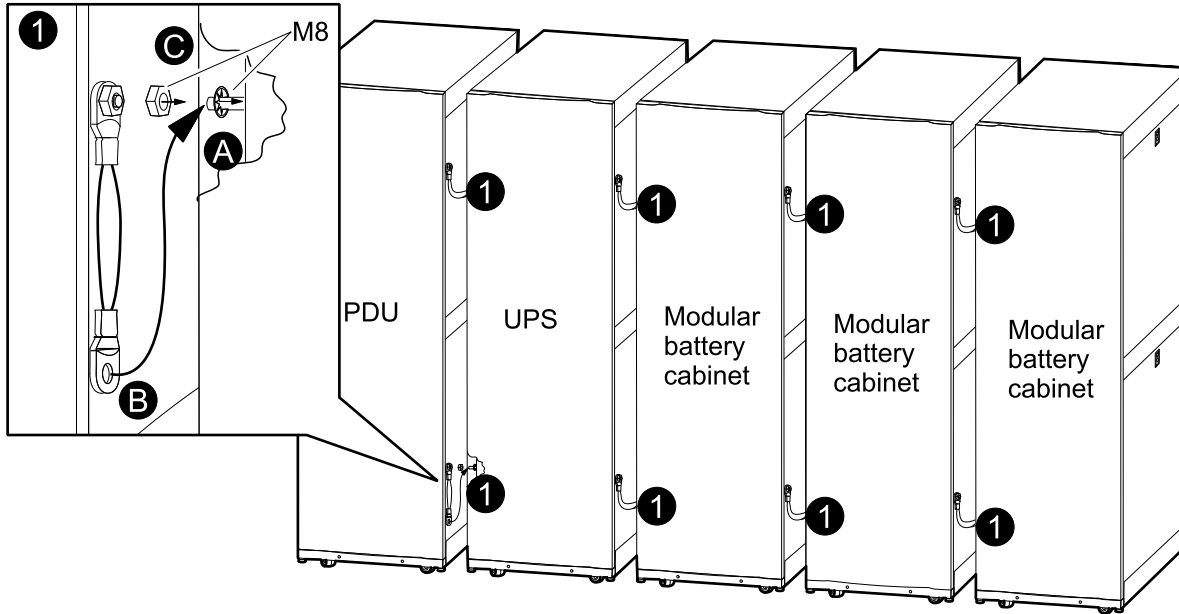
EPO Switch Wiring Diagram



Perform Equipotential Bonding

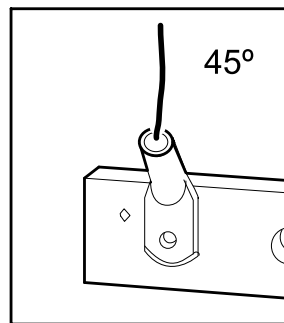
NOTE: It might be necessary to move some of the equipotential bonding wires to fit your system configuration.

1. Connect the two equipotential bonding conductors between all cabinets in the system. The bonding conductors are preconnected to the PDU with modular batteries, the UPS, and all the modular battery cabinets. Add the bonding conductor (B) and the star washer on to the PEM stud (A) in the neighboring cabinet, then fasten the M8 nut (C) to the PEM stud (A) to complete the bonding. (Note: Star washer may be captive on the nut.)



Connect Power Cables Between the UPS and the PDU with Modular Batteries

NOTE: This procedure is only applicable to systems with UPS and PDU with modular battery cabinets.



Schneider Electric recommends using a 45° cable lug.

Schneider Electric recommends using multiflexible copper cables to route the cables as shown.

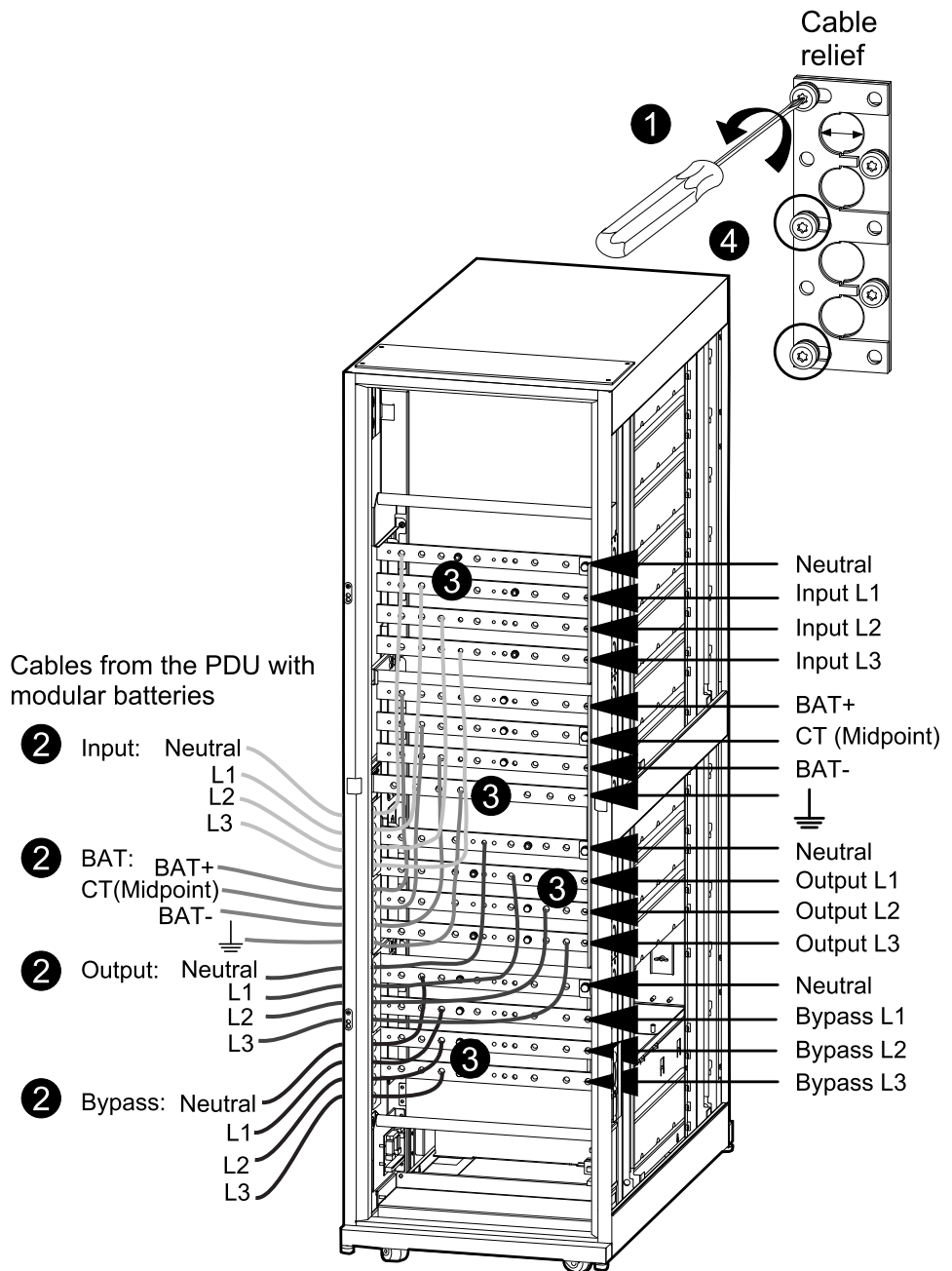
NOTE: Ensure clockwise phase rotation and neutral location. The power terminal bolt diameter is 10 mm and the required torque value is 26 Nm.

NOTE: Do not remove the 12 pcs M10 nylon hex bolts from the busbars. Mount the cables in the open holes.

NOTE: In the UPS, route the cables on the outside of the guide rails when possible (see illustration).

NOTE: The M10 bolts, washers and cable ties are supplied in the UPS accessory kit.

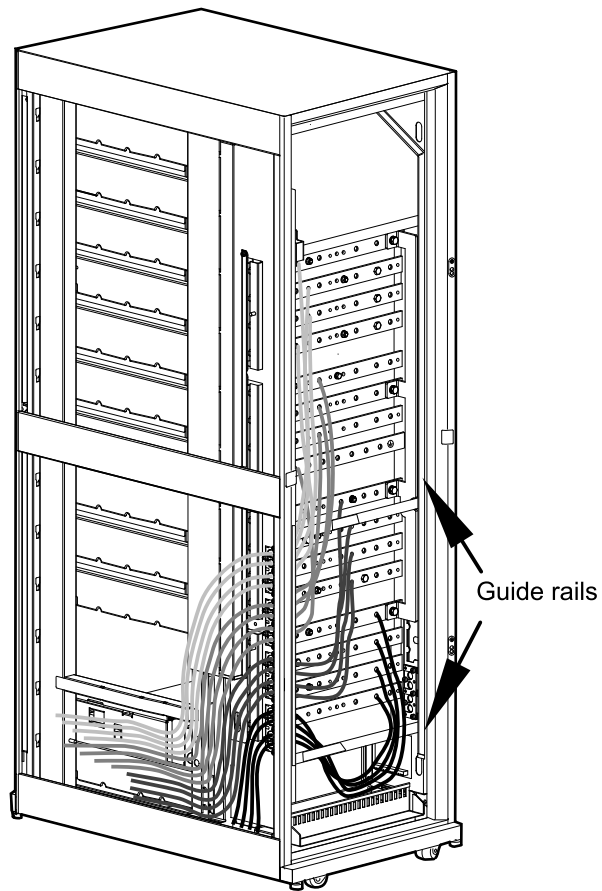
Rear View of the UPS



1. Before running the cables, loosen the three bolts on each cable relief next to the PDU.
2. Route the cables to the UPS through the holes in the cable relief on the side of the cabinet starting from the bottom with the bypass L3 and then working your way upwards. Deposit the cables neatly to minimize cable build-up. Do not fasten the cables.
3. Mount the cables to the busbars according to the labels.

4. Tighten the three bolts on each cable relief.

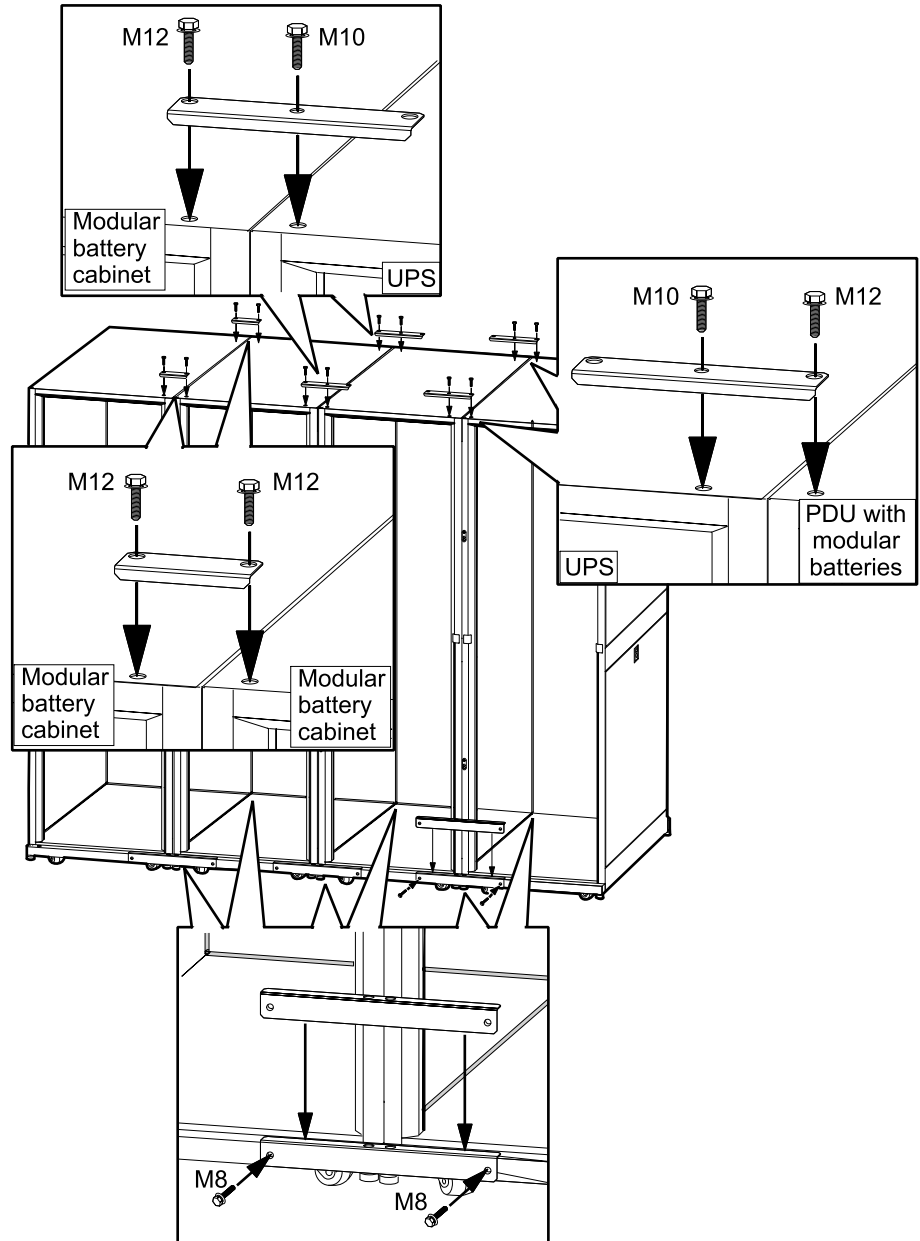
Side View of the UPS



Interconnect the Cabinets

NOTE: The communication and power cables must be connected between the cabinets before the cabinets are interconnected. Follow the described installation procedure.

1. Align the cabinets.
2. Connect the exterior joining brackets (provided) to secure and bond the cabinets.



Level the Cabinets

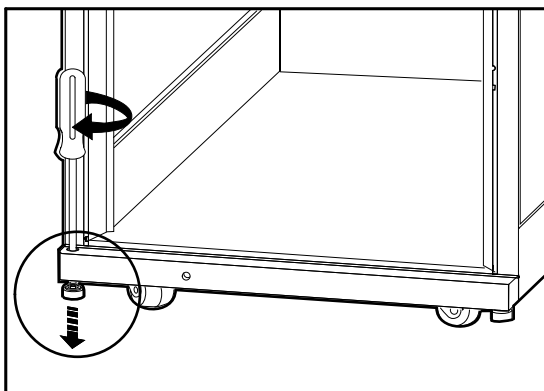
⚠ WARNING

TIP HAZARD

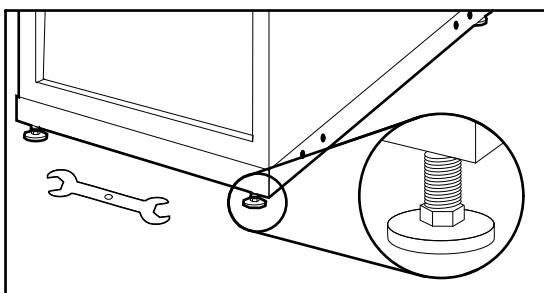
The system must be installed on a level floor. The leveling feet will stabilize the cabinet, but will not compensate for a badly sloped floor.

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

1. Use a screwdriver to lower the four leveling feet



2. Use a wrench to adjust the four leveling feet and ensure that the cabinet is level.

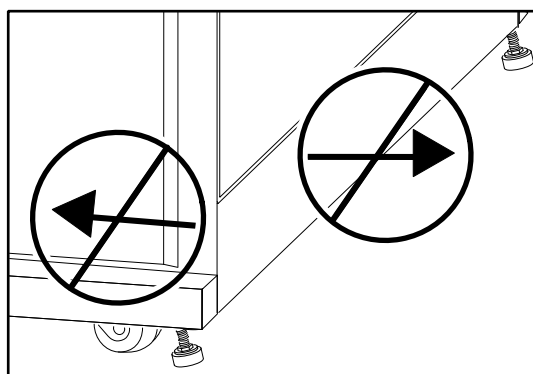


⚠ WARNING

TIP HAZARD

Do not move the cabinet after the leveling feet have been lowered.

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



Connect Power Cables

Connect Power Cables in Installations with UPS and PDU with Modular Batteries

1. Connect the Input Cables in the PDU with Modular Batteries, page 46. Follow one of the procedures:
 - Connect Power Cables in Single Mains Installations, page 47.
 - Connect Power Cables in Dual Mains Installations, page 48
2. Connect the PDU Subfeed Breakers, page 50.
3. Install Power Distribution Modules in the PDU with Modular Batteries, page 52.

Connect the Input Cables in the PDU with Modular Batteries

▲ CAUTION

HAZARD OF EQUIPMENT DAMAGE

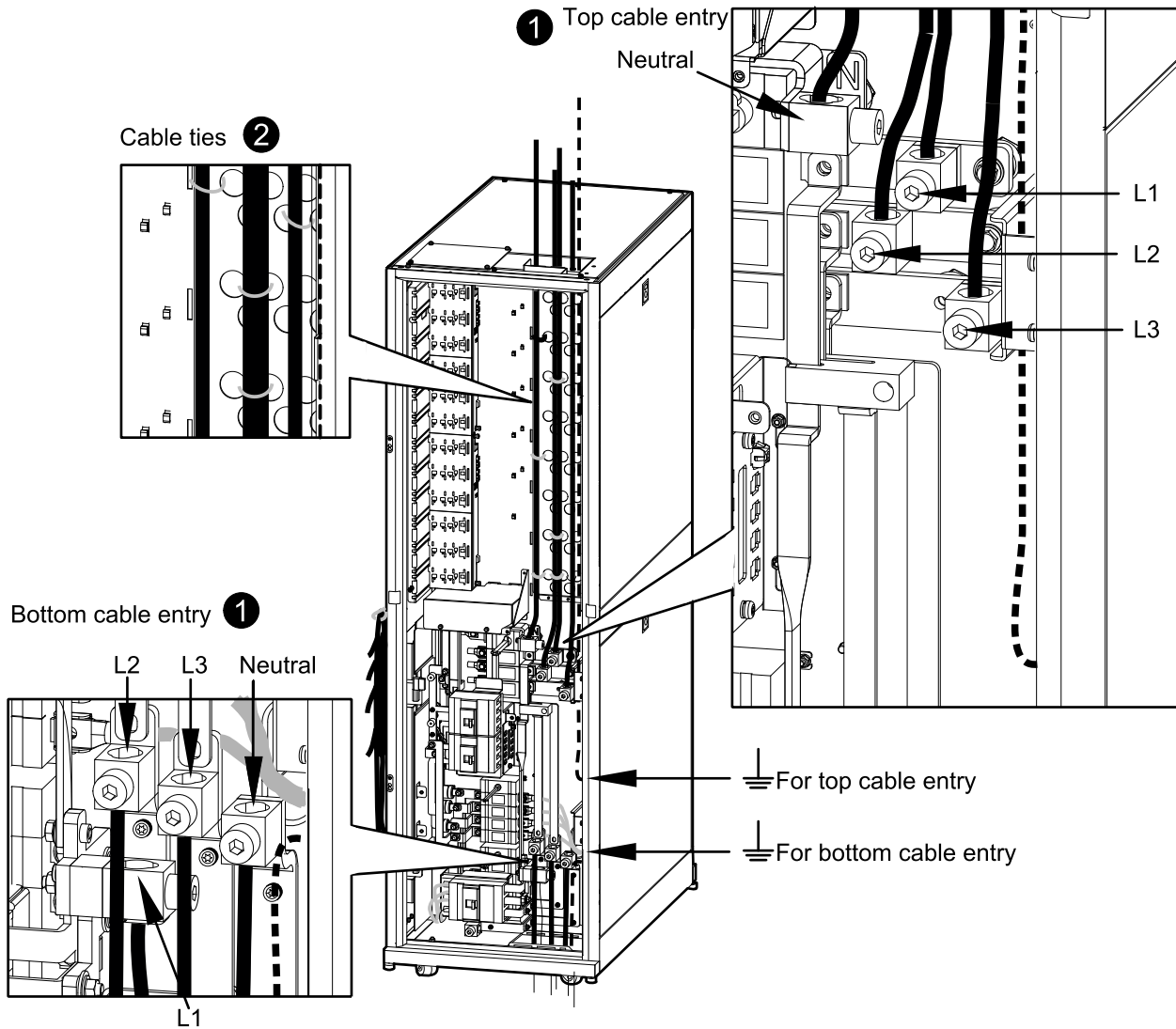
Ensure clockwise phase rotation and neutral location of the power terminal bolt. The cable lug accepts up to 300 mm² copper cables (or two 130 mm² copper cables). In dual mains systems the maximum cables sizes are limited by the cable channel which accepts up to 120 mm² input and bypass copper cables. The required torque value is 62 Nm.

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

NOTE: The neutral wire from the input and bypass is hardwired in the UPS. Do not install a jumper between the two neutral connections in single mains installations.

Connect Power Cables in Single Mains Installations

Front View of the PDU with Modular Batteries

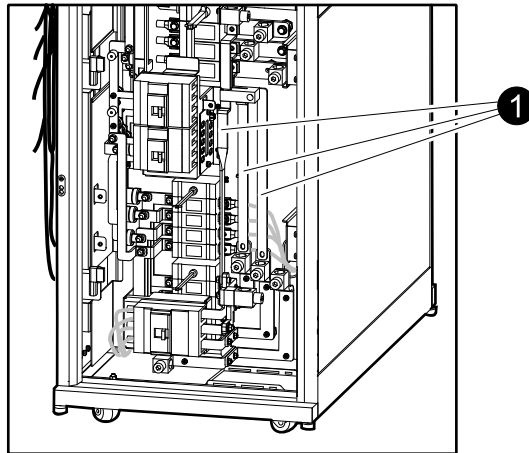


NOTE: Run the input cables as far to the right as possible to make room for the power distribution module cables, that will be connected later.

1. Route the cables from the top or bottom and connect as follows:
 - In systems with top cable entry, connect the input cables to the input terminals.
 - In systems with bottom cable entry, connect the input cables to the bypass terminals.
2. In top entry systems, fasten the cables to the cable tray using cable ties with a minimum loop tensile of 80 kg (supplied).

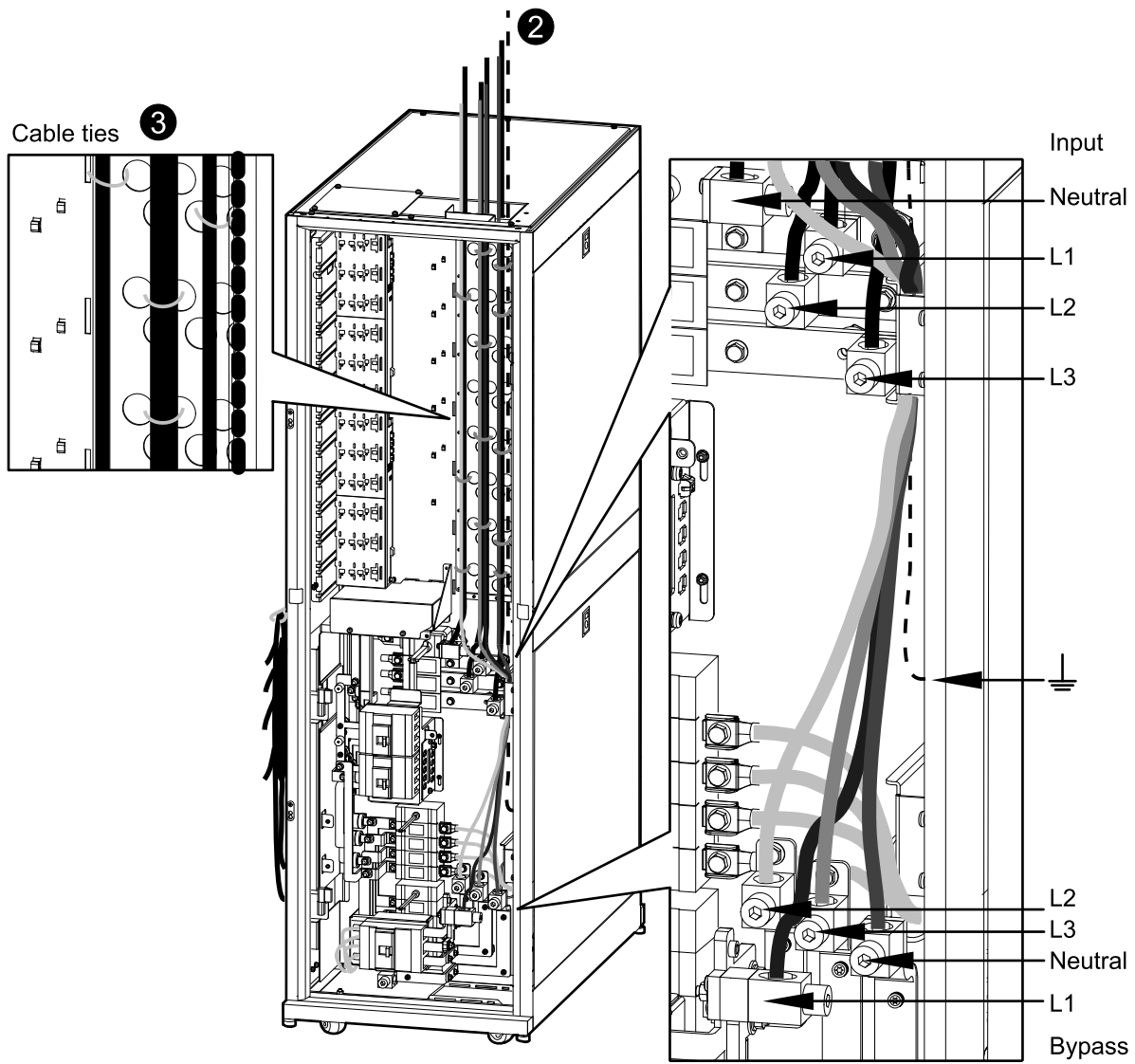
Connect Power Cables in Dual Mains Installations

Front View of the PDU with Modular Batteries

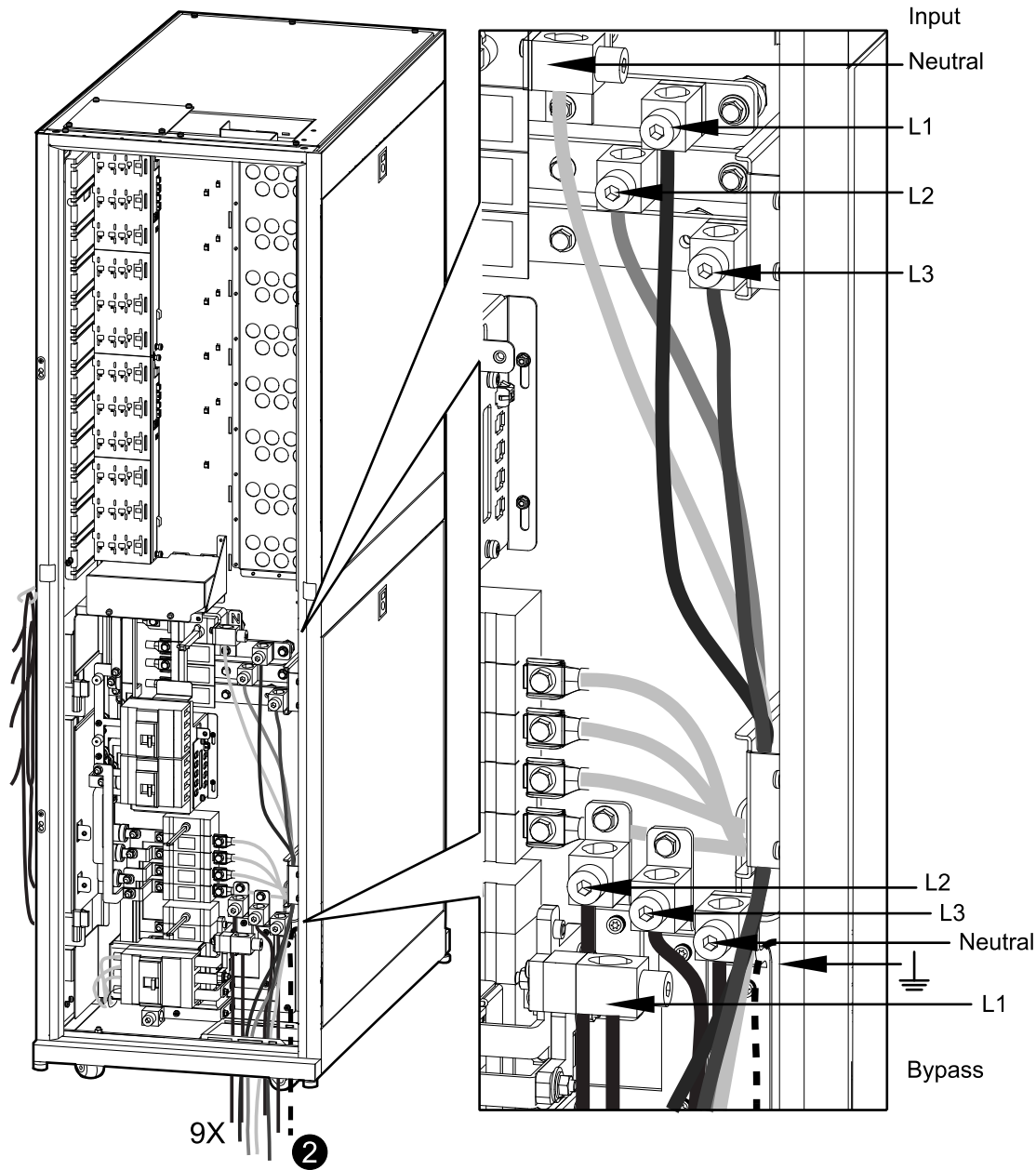


1. Remove the three single mains busbars.
2. Route the cables through the top or bottom and connect the input cables to the input and the bypass cables to the bypass terminals.
3. In top cable systems, fasten the cables to the cable tray using cable ties with a minimum loop tensile of 80 kg (supplied).

Top Cable Entry System – Front View of the PDU with Modular Batteries



Bottom Cable Entry System – Front View of the PDU with Modular Batteries



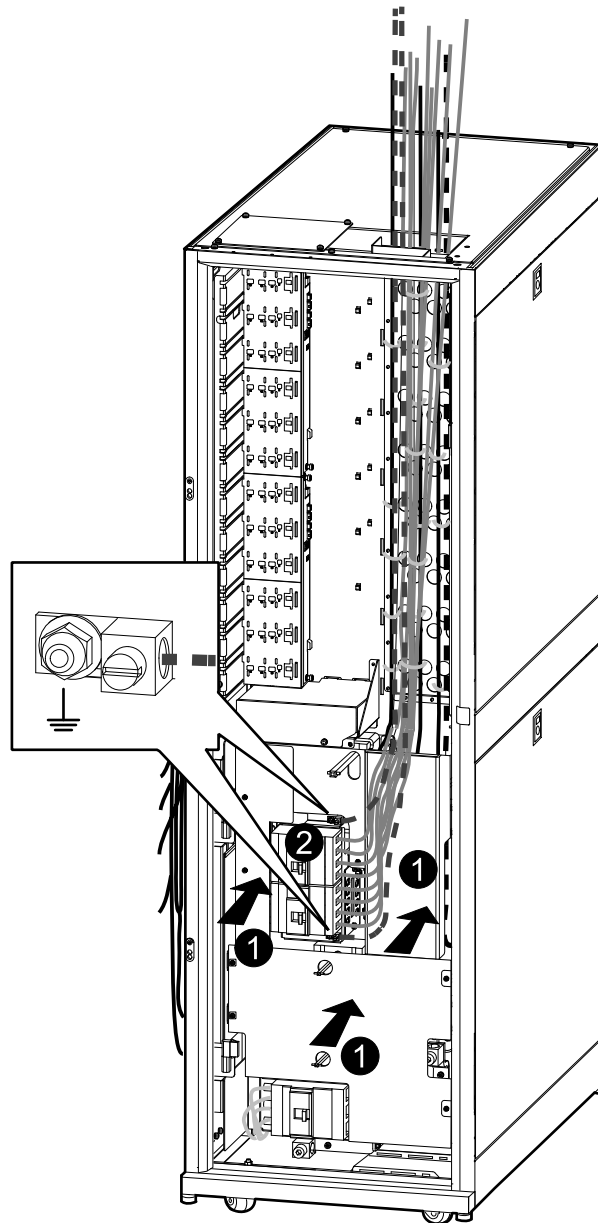
Connect the PDU Subfeed Breakers

⚠ CAUTION
HAZARD OF EQUIPMENT DAMAGE
Ensure clockwise phase rotation and neutral location of the power terminal bolt. The breaker terminals accept up to 70 mm ² cables. The required torque value is 26 Nm.
Failure to follow these instructions can result in injury or equipment damage.

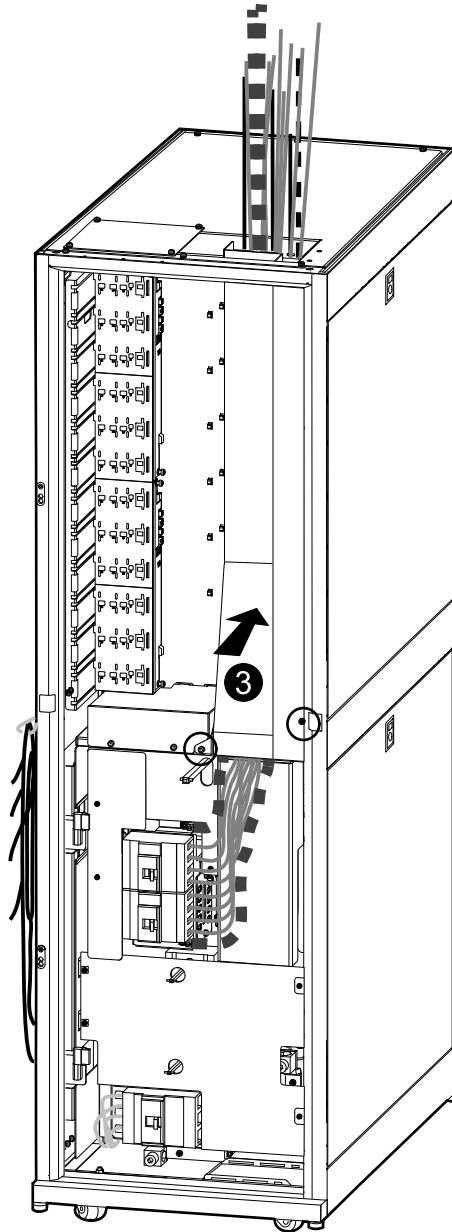
Each subfeed breaker is rated for a maximum of 160 A.

1. Reinstall the three blanking panels.

2. Connect the cables to the subfeed breakers (cables are not supplied).



3. Reinstall the cable channel.



Install Power Distribution Modules in the PDU with Modular Batteries

⚠ DANGER

HAZARD OF ELECTRIC SHOCK

To install a power distribution module:

- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures.

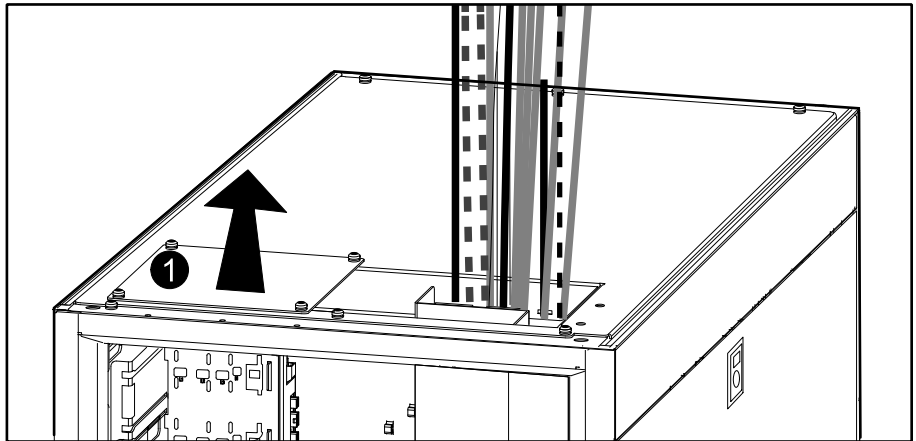
Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION**RISK OF INJURY OR EQUIPMENT DAMAGE**

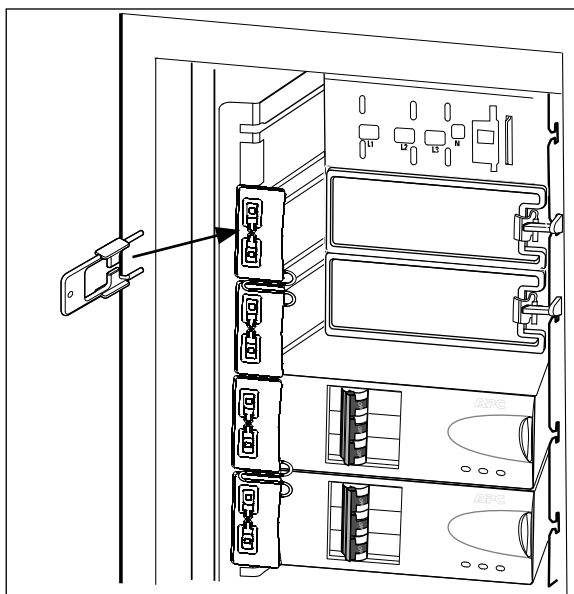
- Install only Schneider Electric power distribution modules with matching output voltage.
- Install power distribution modules starting from the bottom of the panel to avoid cable congestion.
- Save filler plates for future reuse. If a module is removed, a filler plate must be installed to cover the open busbar.
- Slot locks (attached together in pairs) must always be installed on all power distribution module positions in the panel whether filled by a power distribution module or a filler plate.
- Make sure all breakers on the power distribution modules being installed are in the OFF (open) position.

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

1. Remove the left top plate of the PDU with the modular batteries.

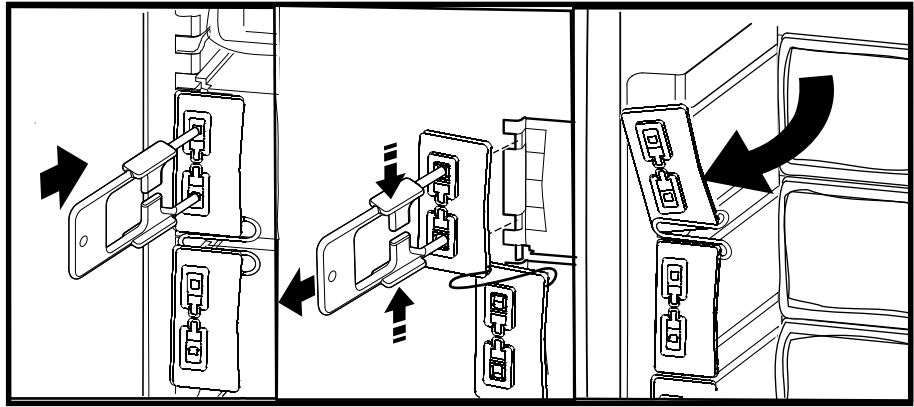
Front View of the PDU with Modular Batteries

2. Insert the slot key in the slot lock.

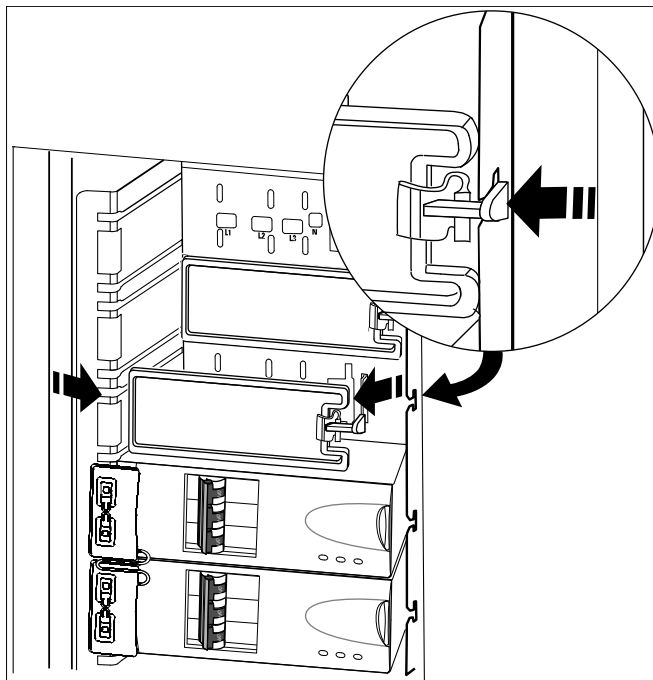


3. Squeeze the sides of the key inwards to grasp the slot lock firmly.

4. Pull the slot key out while squeezing to extract the slot lock from the slot.



5. To remove a filler plate: Press down on the filler plate clip to release the locking mechanism and pull the filler plate directly towards you.



6. Press down on the red button to open the latch on the front of the power distribution module.
7. Route the cable on the power distribution module through the top of the cabinet.

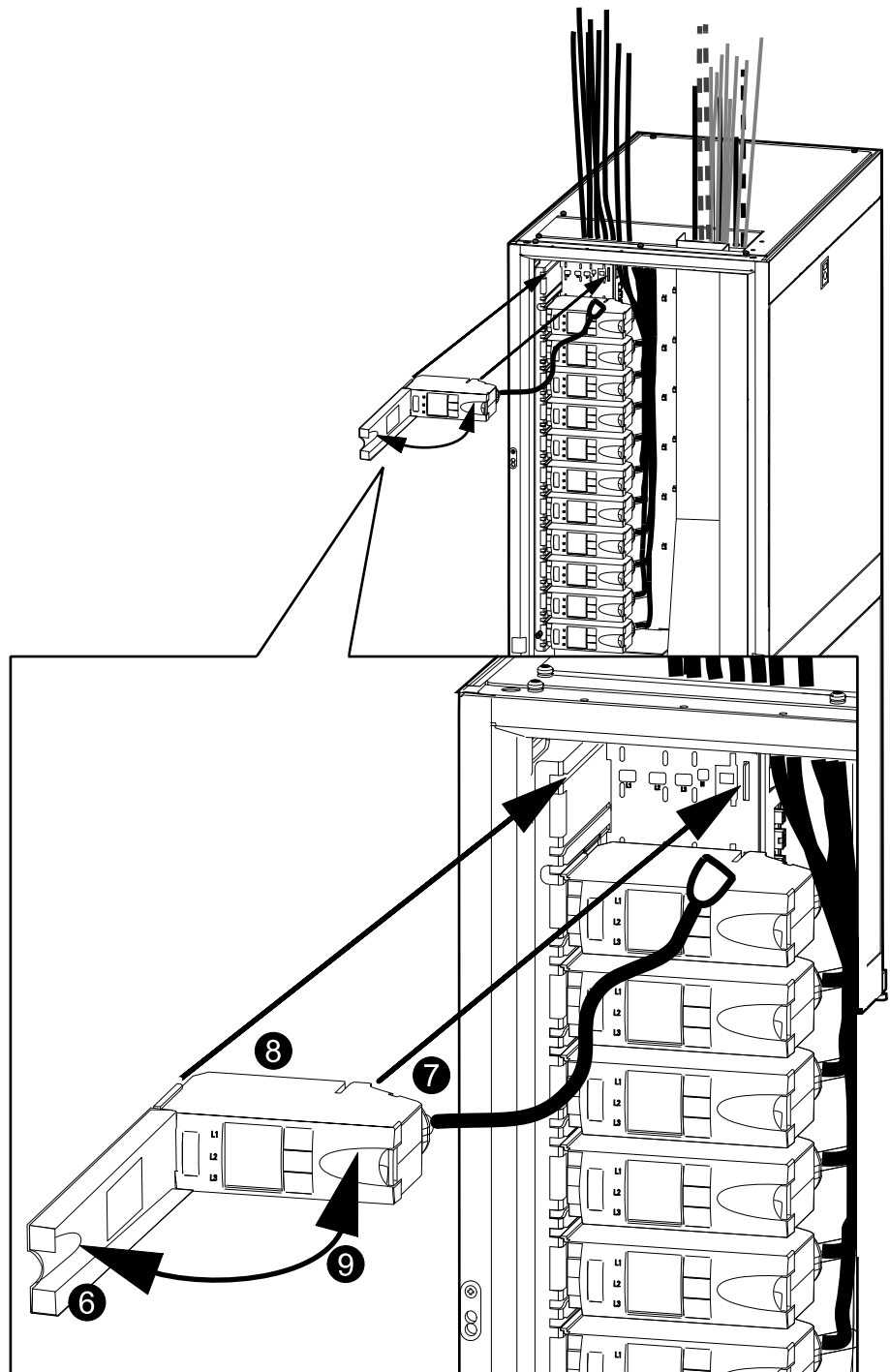
NOTE: Leave a minimum of 178 mm of slack in the cable behind the module. The slack is useful in case the module is ever removed or replaced. (254 to 508 mm (10 to 20 in) is recommended, but space restrictions in the PDU and cable diameter size will cause the amount of slack to necessarily vary.)

NOTE: When installing power distribution modules near the top of the panel, feed the cable first, pull up the slack, and then fasten the module to the busbar to avoid cable congestion between the panel and the slot.

8. Slide the power distribution module into the panel via the slots. Make sure that you slide it all the way in, so it connects with the busbar.

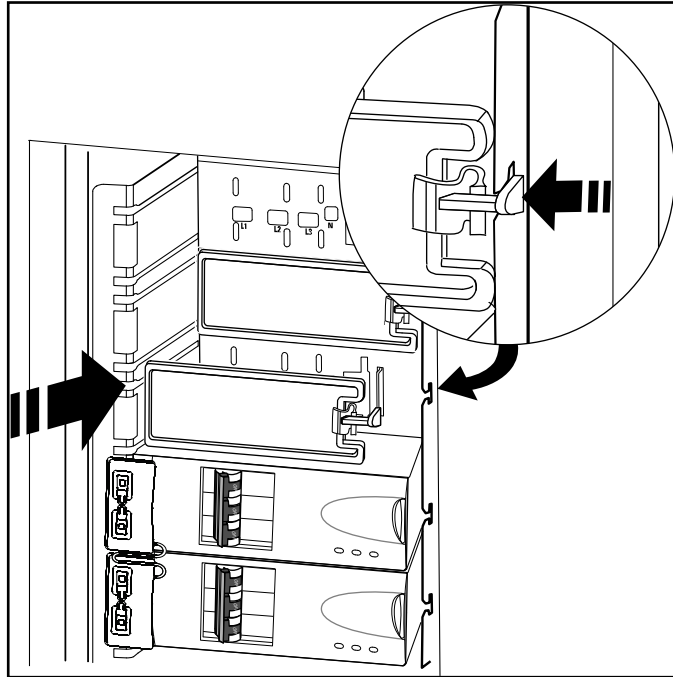
9. Close the latch to secure the power distribution module.

Front View of the PDU with Modular Batteries

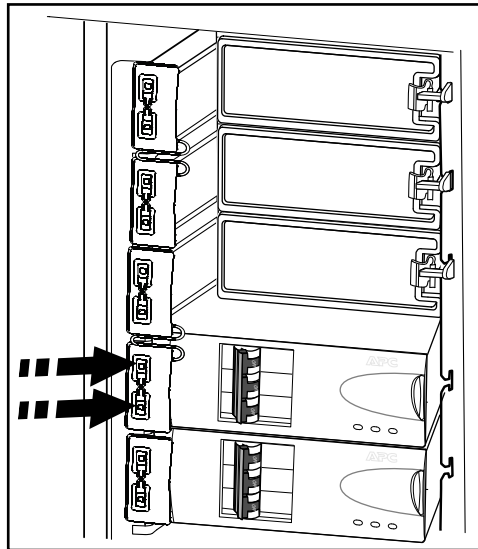


10. Set the required breakers on the new power distribution module to the ON (closed) position.

11. Only for power distribution positions that are empty:
 - a. Insert the bottom tab of the filler plate into the slot and slide the filler plate towards the busbar.
 - b. Snap the filler plate into position and check that the latch is secure.



12. Install the slot lock by pressing it into the slots.

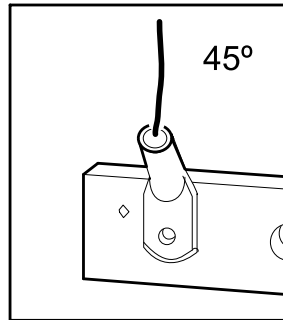


13. Connect the power distribution module cable to the appropriate equipment.

Connect Power Cables in Systems with UPS and Modular Battery Cabinets or Classic Battery Cabinets

1. Connect the Power Cables in the UPS, page 57. Follow one of the procedures:
 - Connect Power Cables in Single Mains Installations, page 57.
 - Connect Power Cables in Dual Mains Installations, page 58.

Connect the Power Cables in the UPS



Schneider Electric recommends using a 45° cable lug.

NOTE: Do not remove the 12 pcs M10 nylon hex bolts from the busbars. Mount the cables in the open holes.

NOTE: The M10 bolts, washers, and cable ties are supplied in the UPS accessory kit.

Connect Power Cables in Single Mains Installations

⚠ CAUTION

HAZARD OF EQUIPMENT DAMAGE

Ensure clockwise phase rotation and neutral location. The power terminal bolt diameter is 10 mm. The required torque value is 26 Nm.

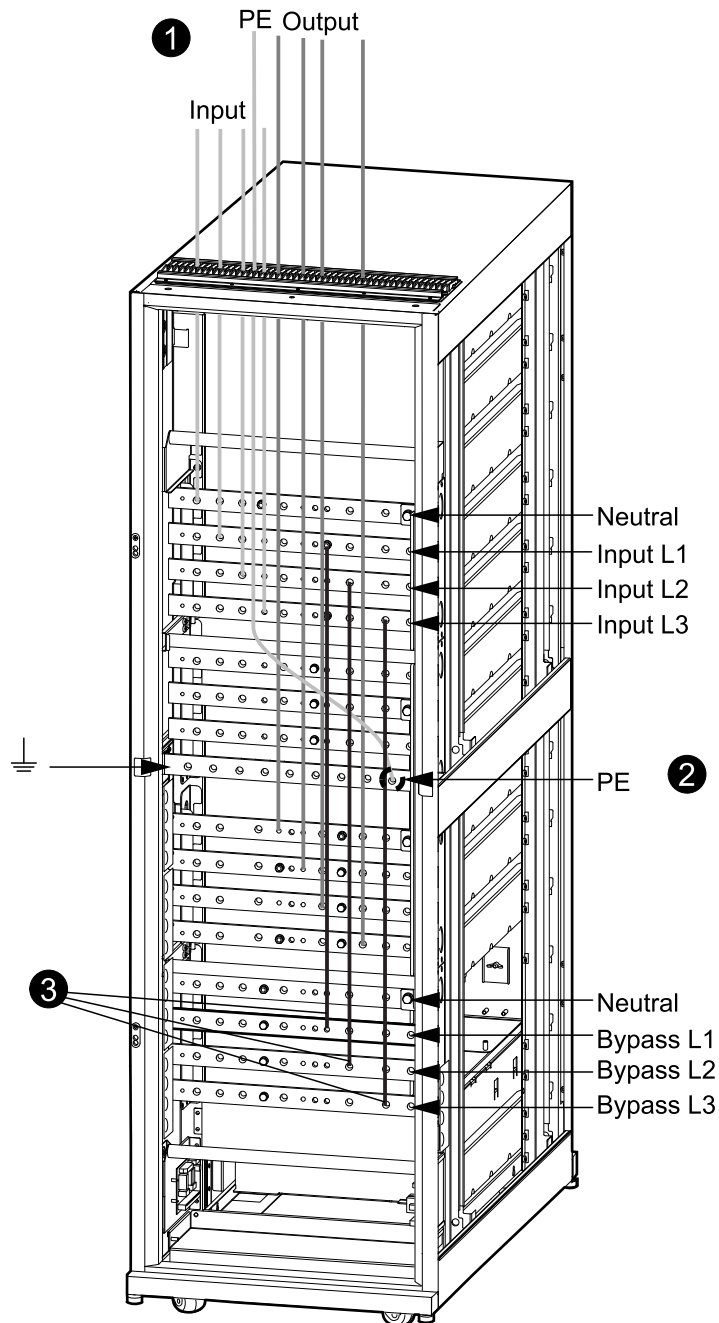
Failure to follow these instructions can result in injury or equipment damage.

NOTE: The neutral wire from the input and bypass is hardwired in the UPS. Do not install a jumper between the two neutral connections in single mains installations.

1. Run the cables through top or bottom of the UPS cabinet and mount the cables to the busbars according to the labels.
2. Connect the PE cable in the UPS cabinet according to the symbol on the grounding rail.

3. Install the three cables (0W3617) included with the unit.

Rear view of the UPS



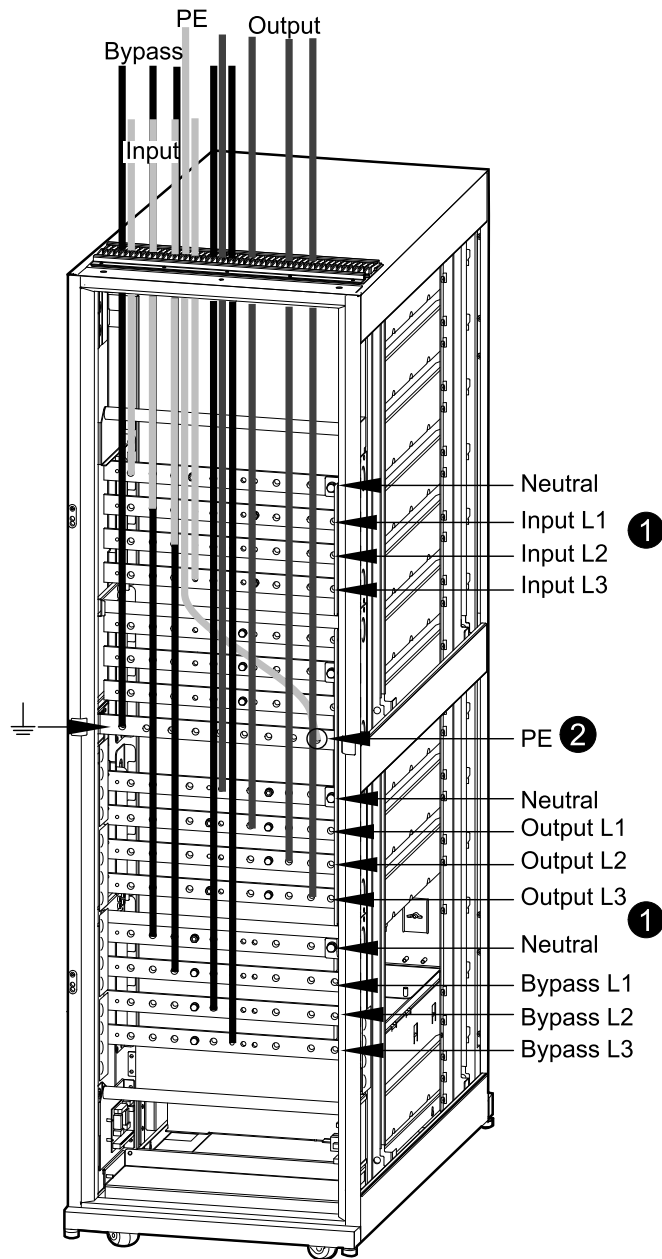
Connect Power Cables in Dual Mains Installations

NOTE: Ensure clockwise phase rotation and neutral location. The power terminal bolt diameter is 10 mm. The required torque value is 26 Nm.

1. Route the cables through top or bottom of the UPS cabinet and mount the cables to the busbars according to the labels.

2. Connect the PE cable in the UPS according to the symbol on the grounding rail.

Rear View of the UPS



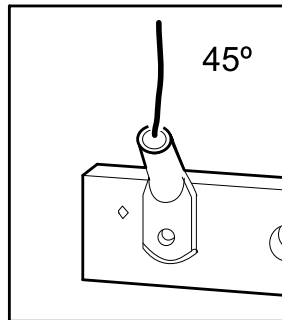
Connect the Battery Cables in the UPS

NOTE: Battery cables from modular battery cabinets can be routed through the side, top, or bottom of the UPS. Battery cables from classic battery cabinets can only be routed through the bottom of the UPS. Battery cables from third party battery cabinets can only be routed through the top or bottom of the UPS.

NOTE: When possible, route the battery cables on the outside of the guide rails in the UPS.

NOTE: Do not remove the 12 pcs M10 nylon hex bolts from the busbars. Mount the cables in the open holes.

NOTE: The M10 bolts, washers, and cable ties are supplied in the UPS accessory kit.



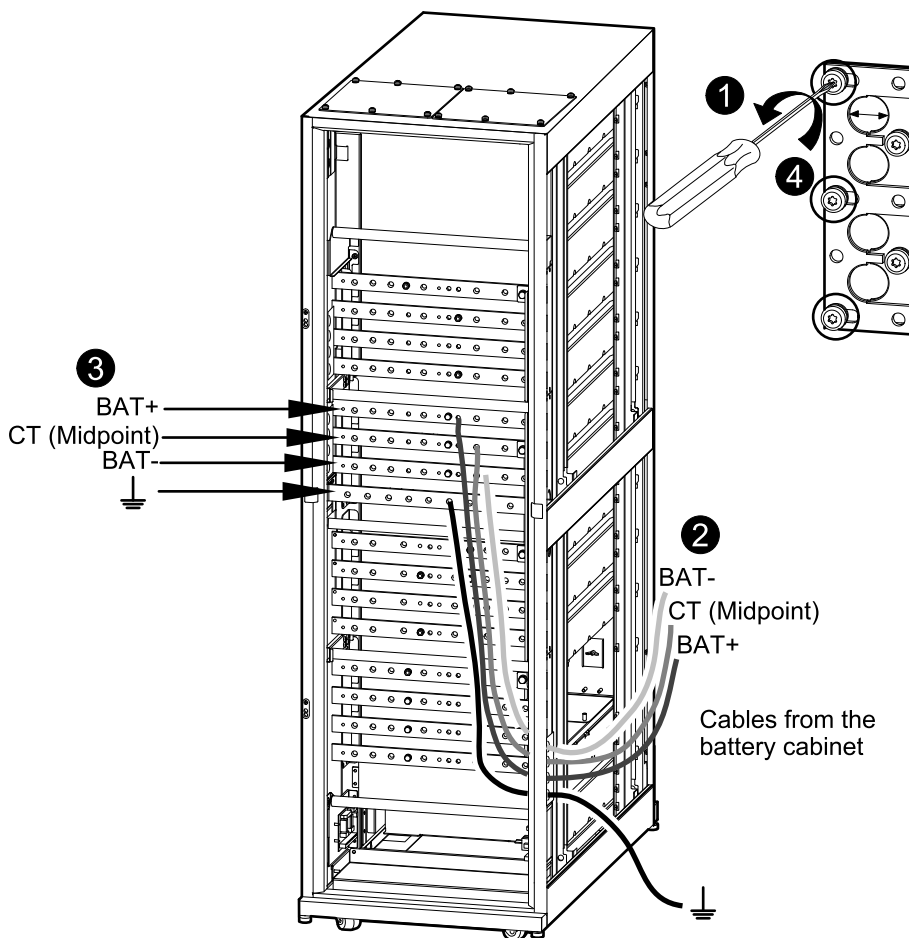
Schneider Electric recommends using a 45° cable lug.

Connect Battery Cables to the UPS in Systems with Modular Battery Solution and Side Cable Entry

1. Before running the cables through the side, loosen the three bolts on the cable relief in the UPS next to the battery cabinet.
2. Route the battery cables to the UPS through the holes in the cable relief.
3. Mount the battery cables BAT-, BAT+, CT (midpoint) to the busbars according to the labels. Secure the cables with cable ties.

- Tighten the three bolts on the cable relief.

Rear View of the UPS



Connect Battery Cables to the UPS – Top and Bottom Cable Entry

⚠ DANGER

HAZARD OF FIRE OR ARC FLASH

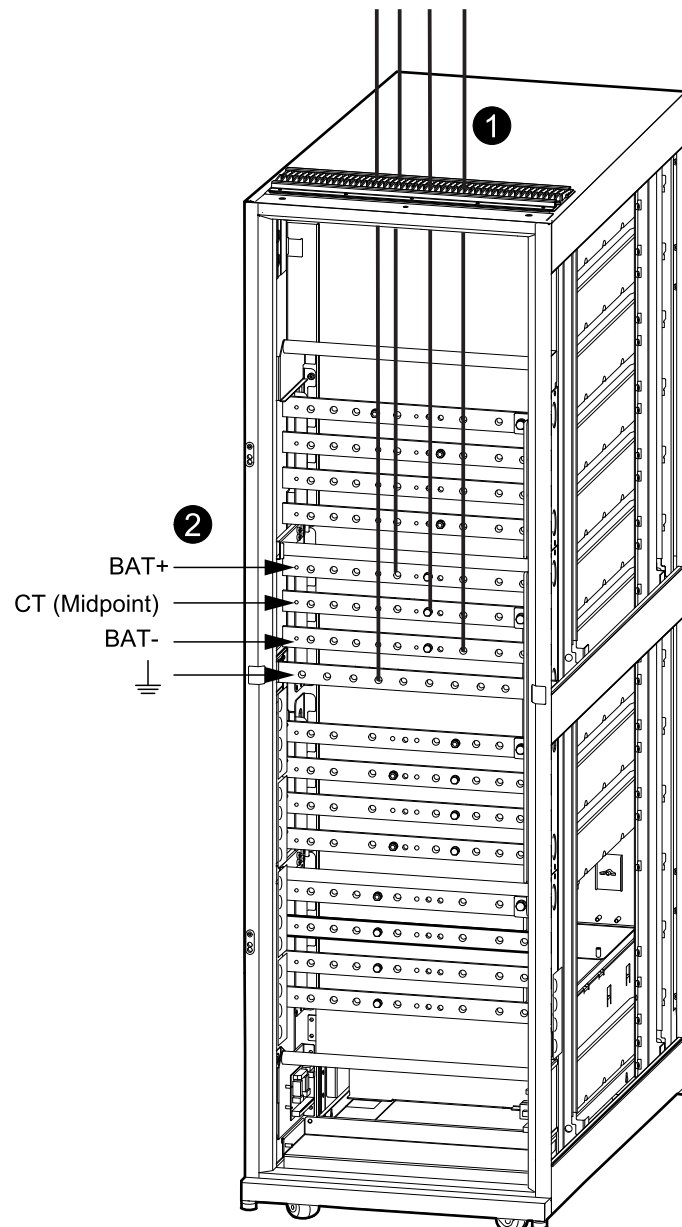
It is mandatory to protect the battery circuit with a Schneider Electric circuit breaker equipped with an power on trip coil (MX 230 VAC).

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

- Route the battery cables through either the top or the bottom of the UPS.

2. Mount the battery cables BAT-, BAT+, CT (midpoint) to the busbars according to the labels.

Rear View of the UPS



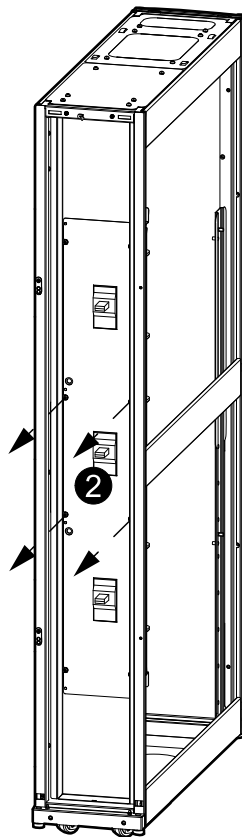
Install the Maintenance Bypass Cabinet (Option)

NOTE: These instructions are valid for the floor-mount half-rack (300 mm wide) maintenance bypass cabinet. For other types of maintenance bypasses, please refer to the instructions provided with the maintenance bypass.

Remove the Breaker Cover Panel from the Maintenance Bypass Cabinet

1. Remove the front panel by pushing the two latches in the top of the panel.
2. Remove the breaker cover panel by removing the four mounting screws.

Front View of the Maintenance Bypass Cabinet



3. Perform equipotential bonding and interconnect and level the maintenance bypass cabinet with the other cabinets – see Perform Equipotential Bonding, page 40 and Interconnect the Cabinets, page 44 on how to do this.

Maintenance Bypass Field Wiring Specification

Input wiring		
Ambient temperature	Max input current	Wire size
30 °C	332 A	2 x 120 mm ² (AWG 4/0)

Output wiring		
Ambient temperature	Max input current	Wire size
30 °C	278 A	2 x 120 mm ² (AWG 4/0)

NOTE: If the ambient room temperature is higher than 30 °C, larger wires are to be selected in accordance with the national wiring requirements.

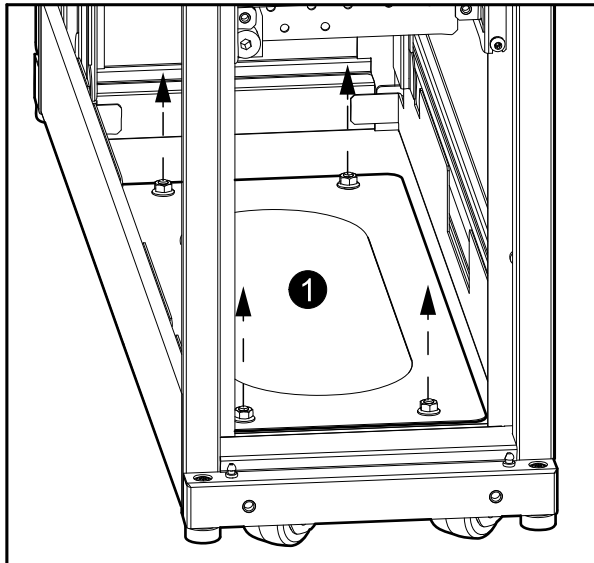
Prepare the Maintenance Bypass Cabinet for Cables in Bottom Cable Entry Systems

⚠ CAUTION
<p>HAZARD OF EQUIPMENT DAMAGE</p> <p>Ensure sharp edges from drilling are properly covered to prevent damaging cable insulation.</p> <p>Failure to follow these instructions can result in injury or equipment damage.</p>

⚠ CAUTION
<p>HAZARD OF EQUIPMENT DAMAGE</p> <p>Remove the cover plates from the cabinet. Drilling or cutting of plates must not take place over the top or inside the cabinet or while plates are installed in the cabinet.</p> <p>Failure to follow these instructions can result in injury or equipment damage.</p>

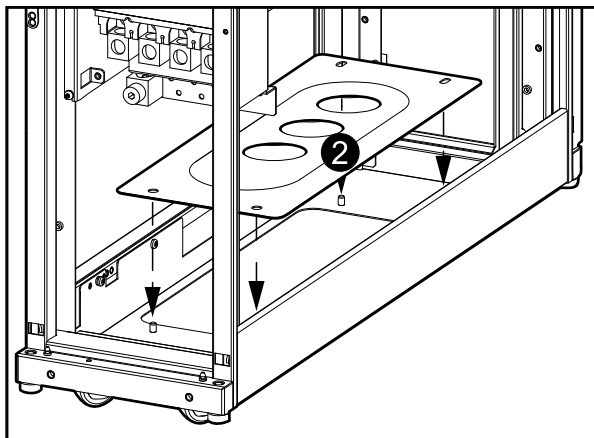
1. Remove the dedicated bottom cover plate for power cables.

Front View of the Maintenance Bypass Cabinet



2. Drill holes as needed in the bottom plate for conduits and reinstall the bottom plate with the conduits installed.

Front View of the Maintenance Bypass Cabinet



Prepare the Maintenance Bypass Cabinet for Cables in Top Cable Entry Systems

⚠ CAUTION

HAZARD OF EQUIPMENT DAMAGE

Ensure sharp edges from drilling are properly covered to prevent damaging cable insulation.

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

▲ CAUTION

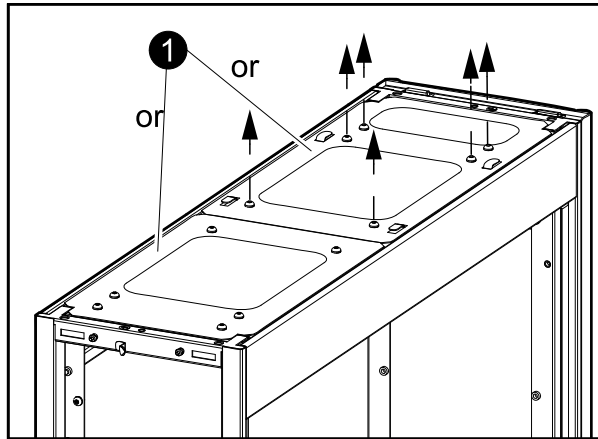
HAZARD OF EQUIPMENT DAMAGE

Remove the cover plates from the cabinet. Drilling or cutting of plates must not take place over the top or inside the cabinet or while plates are installed in the cabinet.

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

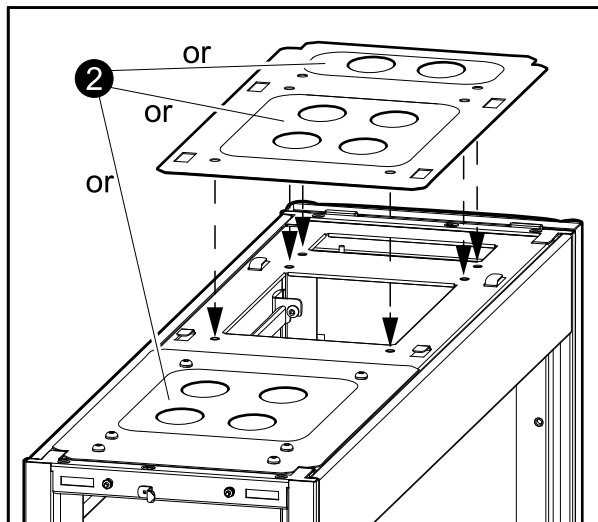
1. Remove the dedicated top cover plate for power cables.

Front View of the Maintenance Bypass Cabinet



2. Drill holes as needed in the top plate for conduits and reinstall the top plate with the conduits installed.

Front View of the Maintenance Bypass Cabinet



Connect Power Cables between the UPS and the Maintenance Bypass Cabinet

⚠ CAUTION

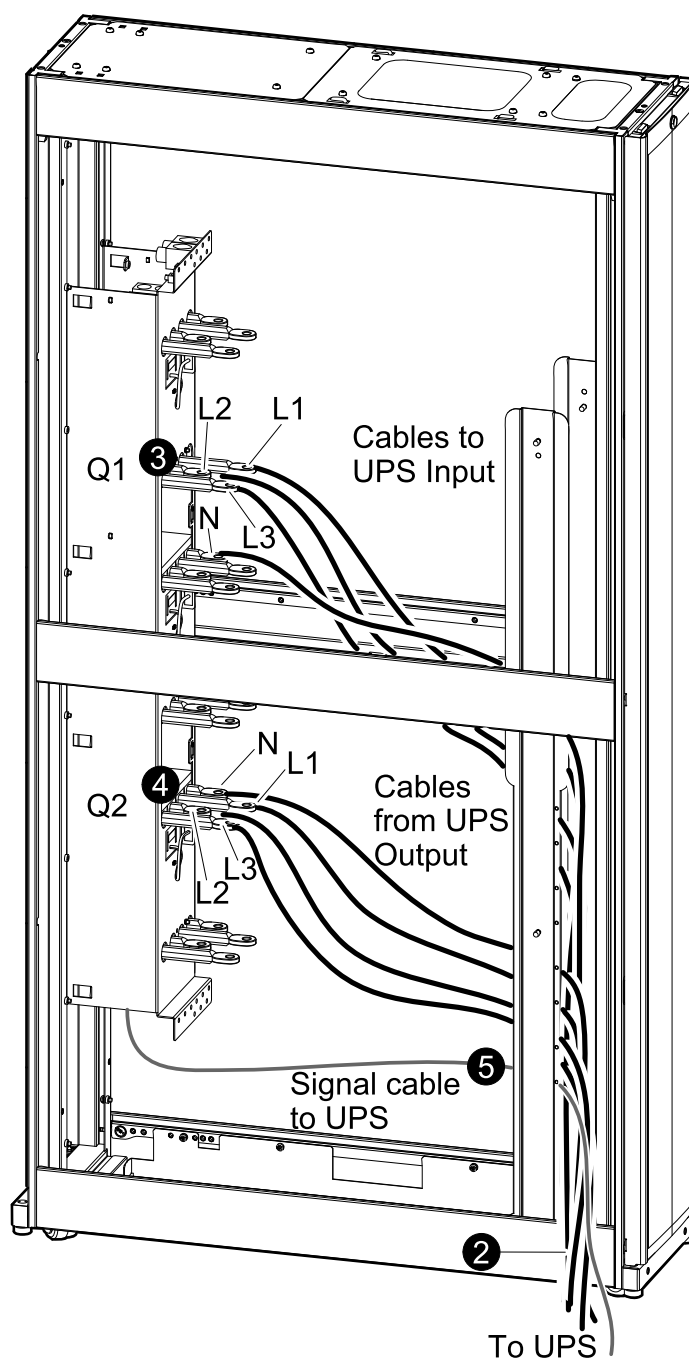
HAZARD OF EQUIPMENT DAMAGE

Ensure sharp edges from drilling are properly covered to prevent damaging cable insulation.

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

The connection can be done from the left or right side of the maintenance bypass cabinet.

Right Side View of the Maintenance Bypass Cabinet



1. Untie/cut the zip ties to uncoil the cables.
2. Route the output and bypass/input cables through the side of the maintenance bypass cabinet and through the cable relief in the UPS.
3. Connect L1, L2, and L3 from maintenance bypass cabinet Q1 bottom and N from maintenance bypass cabinet Q3 top to the UPS bypass.
4. Connect L1, L2, L3 and N from maintenance bypass cabinet Q2 top to the UPS output.
5. Route the signal cable through the side of the maintenance bypass cabinet and into the UPS.

NOTE: When the UPS is installed in environments sensitive to interference, the EMC kit with three ferrite cores must be installed with three loops. Add a clip on ferrite for high frequency noises. Use kit 0J-9147.

6. Remove the jumper wire harness between J1 and J2 on the maintenance bypass interface board (OP3199) in the UPS.
7. Connect the signal cable to J1 and J8 on the maintenance interface board (OP3199) in the UPS.

NOTE: For third party switchgear without surveillance, remove the jumper pin between J2 pins 13 and 14. For wallmounted switchgear with surveillance interconnected to the maintenance bypass interface board, leave the jumper pin installed between J2 pins 13 and 14.

Connect Input and Output Power Cables to the Maintenance Bypass Cabinet

▲ CAUTION

HAZARD OF EQUIPMENT DAMAGE

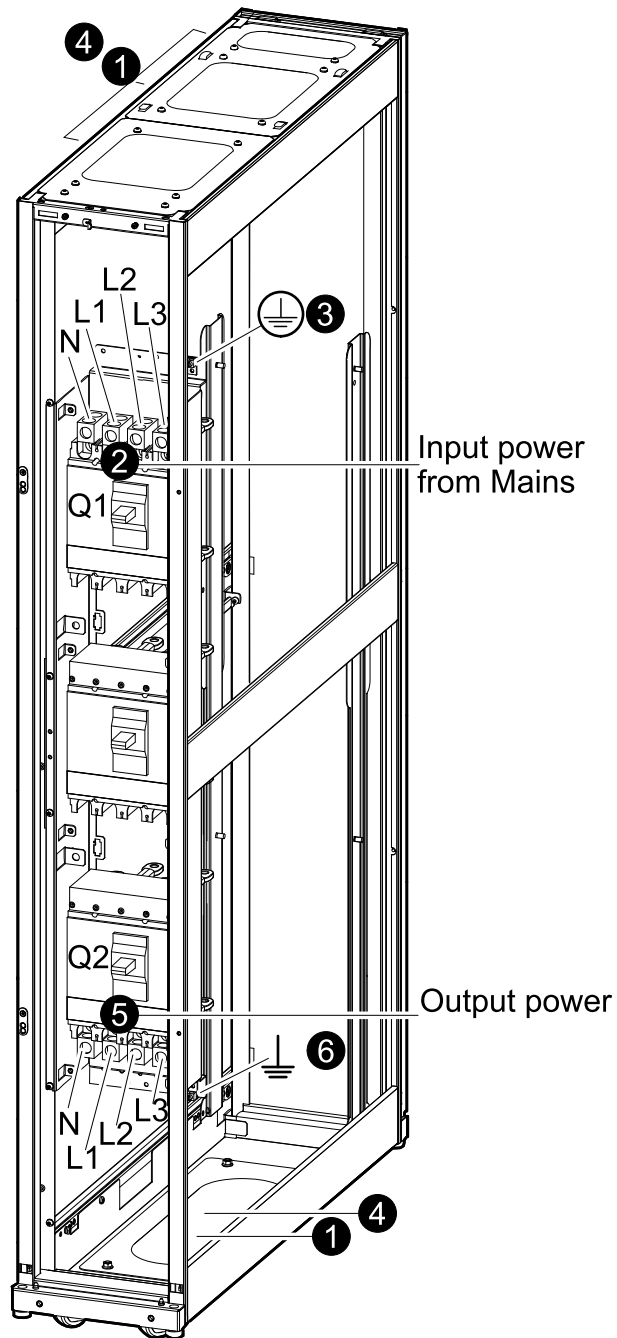
Ensure clockwise phase rotation. The required torque value for the dual-lug breaker input connector is 31 Nm. Use the long set screws for the input cable range of 70 mm² minimum to 120 mm² maximum. Use the short set screws, supplied with maintenance bypass cabinet, for the input cable range of 150 mm² minimum to 300 mm² maximum. Ensure that the plastic cover is installed over the breaker terminals.

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

1. Route the input cables through the top or bottom of the maintenance bypass cabinet to the Q1 input. Remove the plastic cover from the top breaker terminals.
2. Connect the input cables to the L1, L2, L3, N terminals.
3. Connect the Protective Earth (PE) cable to the PE terminal. Install the plastic cover on the top breaker terminals.
4. Route the output cables through the top or bottom of the maintenance bypass cabinet to the Q2 output. Remove the plastic cover from the bottom breaker terminals.
5. Connect the output cables to the L1, L2, L3, N terminals.

- Connect the ground cable to the ground terminal. Install the plastic cover on the bottom breaker terminals.

Front View of the Maintenance Bypass Cabinet



Install the Battery Solution

Install the Modular Battery Solution

The Symmetra PX 160 kW UPS can monitor up to three modular battery cabinets in systems with the PDU with modular batteries and up to four modular battery cabinets in systems without the PDU with modular batteries.

⚠ CAUTION

HAZARD OF EQUIPMENT DAMAGE

The system accepts up to 150 mm² cables. The power terminal bolt diameter is 10 mm and the required torque value is 26 Nm.

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

⚠ DANGER

RISK OF ELECTRIC SHOCK

Do not insert your fingers behind the boards as hazardous voltages are present if batteries are installed.

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

⚠ DANGER

RISK OF BURNS

Failed batteries can reach temperatures that exceed the burn threshold for touchable surfaces.

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

NOTE: In installations with third party batteries, follow the documentation provided with the batteries.

NOTE: Only skilled personnel is allowed access in executing this procedure.

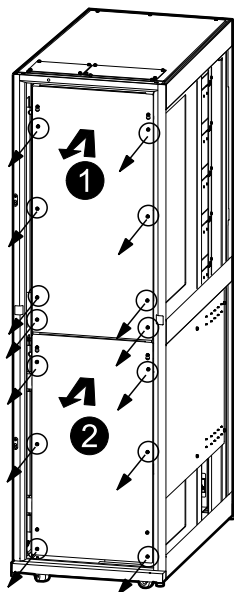
Connect the Battery Cables between the Modular Battery Cabinets

NOTE: For remote modular battery cabinets, the length of the signal cables must not exceed 50 m for the cable that connects the modular battery cabinet to the UPS. The length of the power cables must not exceed 200 m for the cable that connects the modular battery cabinet to the UPS. For power cables between 50 and 200 m, the voltage drop must be taken into account when the cable size is chosen. If the cables exceed the length limit this will result in erratic operation and reduced runtime.

1. In top entry systems, loosen the two top bolts and remove the eight lower bolts from the upper cover plate on the modular battery cabinet. Lift the plate to remove it.

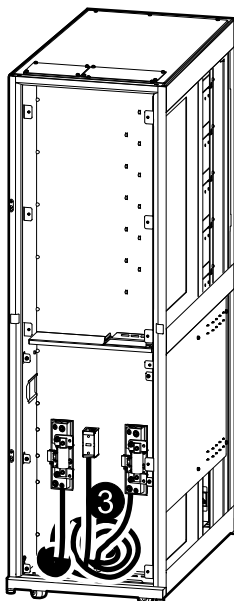
- Loosen the two top bolts and remove the eight lower bolts from the lower cover plate. Lift the plate to remove it.

Rear View of the Modular Battery Cabinet



- Unwind the cables included in each modular battery cabinet. Remove the cable lugs from the cables that will connect to other modular battery cabinets. For the cables that will connect to the UPS, cut off the cable lug on the end that will be mounted in the modular battery cabinet.

Rear View of the Modular Battery Cabinet

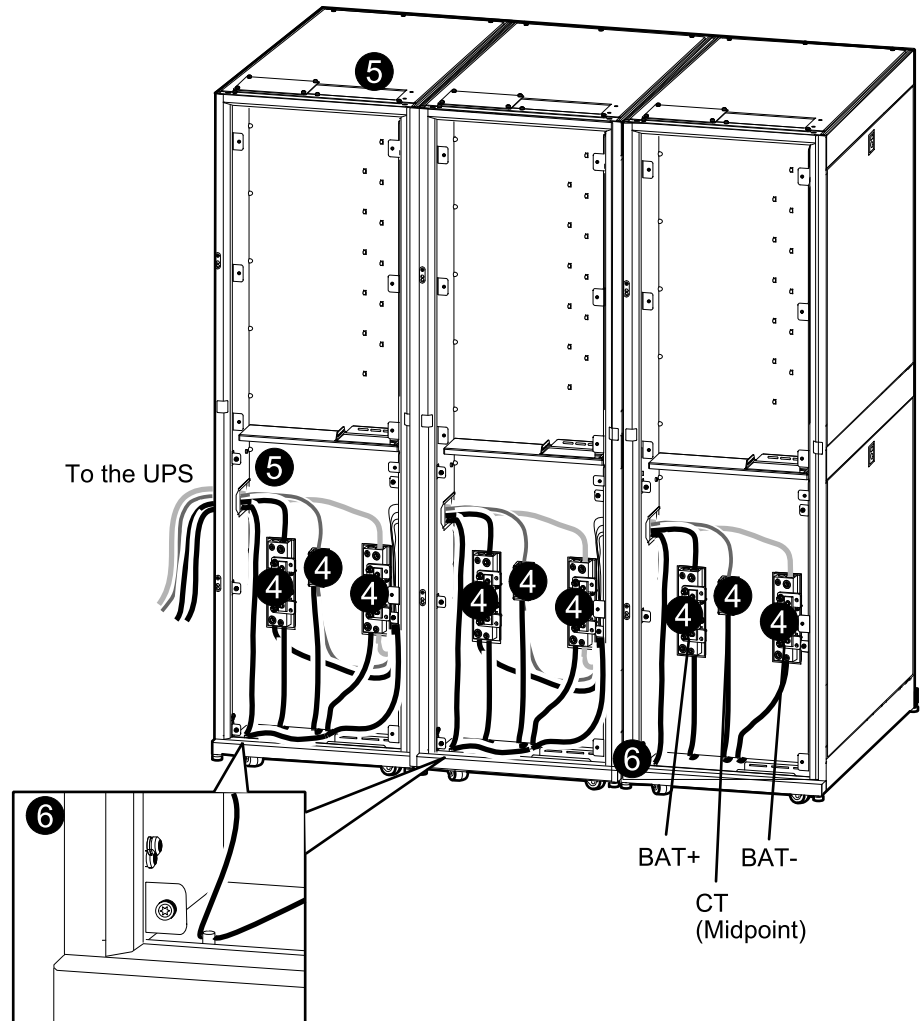


- Connect the ground cable first, and then connect BAT+, BAT-, and CT (midpoint) cables between the modular battery cabinets. Up to three modular battery cabinets can be connected in a daisy chain.

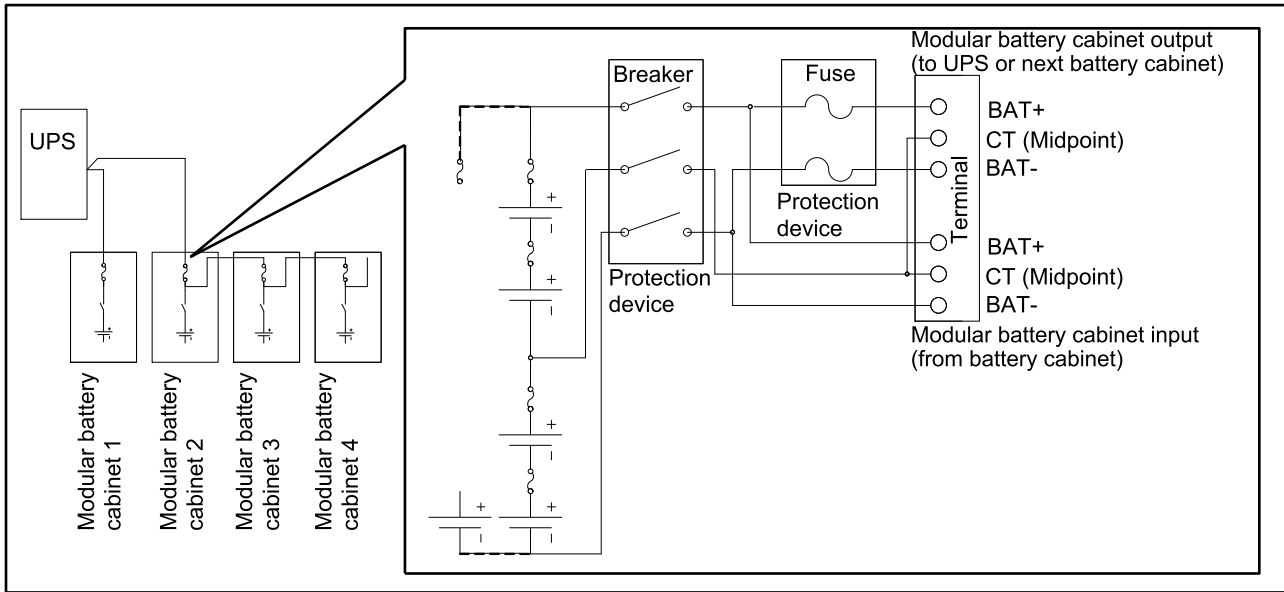
NOTICE
RISK OF LOAD DROP
If a fourth modular battery cabinet is present, it must be connected separately to the UPS. Four modular battery cabinets connected in a daisy chain at 100% load creates risk of load drop.
Failure to follow these instructions can result in equipment damage.

5. Route the ground cable and the BAT+, BAT-, and CT (midpoint) cables from the first modular battery cabinet to the UPS through the side, top, or bottom of the modular battery cabinet.

Rear View of the Modular Battery Cabinets

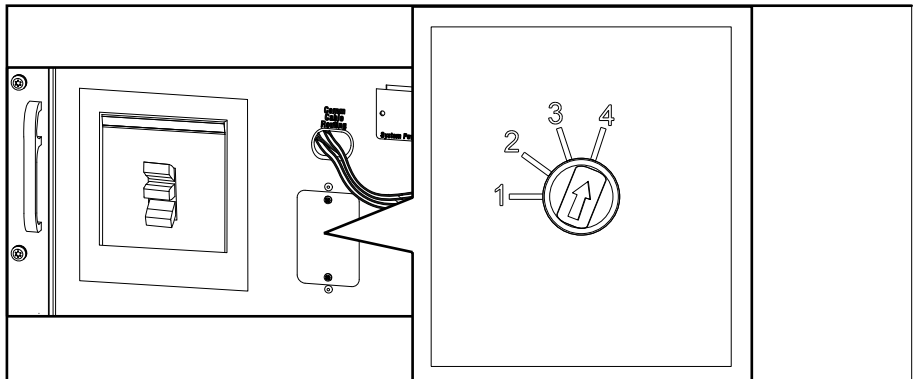


- Connect the equipment grounding cable in the modular battery cabinet that is farthest from the UPS. Route it through the other modular battery cabinets by connecting it from modular battery cabinet to modular battery cabinet to the UPS through the side, top, or bottom of the modular battery cabinet.



Fuse rating	300 A Class J
Breaker rating	320 A with thermal and magnetic trip-unit

- Place the cabinet address on the front of each modular battery cabinet and PDU with modular batteries (if present).



Cabinet address	UPS containing modular batteries ¹⁴	UPS not containing modular batteries
1	Modular battery cabinet 1	PDU with modular batteries/ Modular battery cabinet 1
2	Modular battery cabinet 2	Modular battery cabinet 2
3	Modular battery cabinet 3	Modular battery cabinet 3
4	Modular battery cabinet 4	Modular battery cabinet 4

14. Modular batteries inside a UPS are called mainframe batteries in the display, so a UPS with modular batteries does not have a separate cabinet address.

Install the Classic Battery Solution

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In an installation with third party batteries in the classic battery cabinet:

- Minimum short-circuit current of the batteries must be 1500 A.
- Circuit breaker NSX630S DC MP1 must be installed.
- The documentation from the third party battery vendor must be followed.

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

NOTE: Up to four classic battery cabinets can be installed with the Symmetra PX 160 kW UPS.

Prepare the Classic Battery Cabinet for Installation

Remove Battery Protection on Batteries

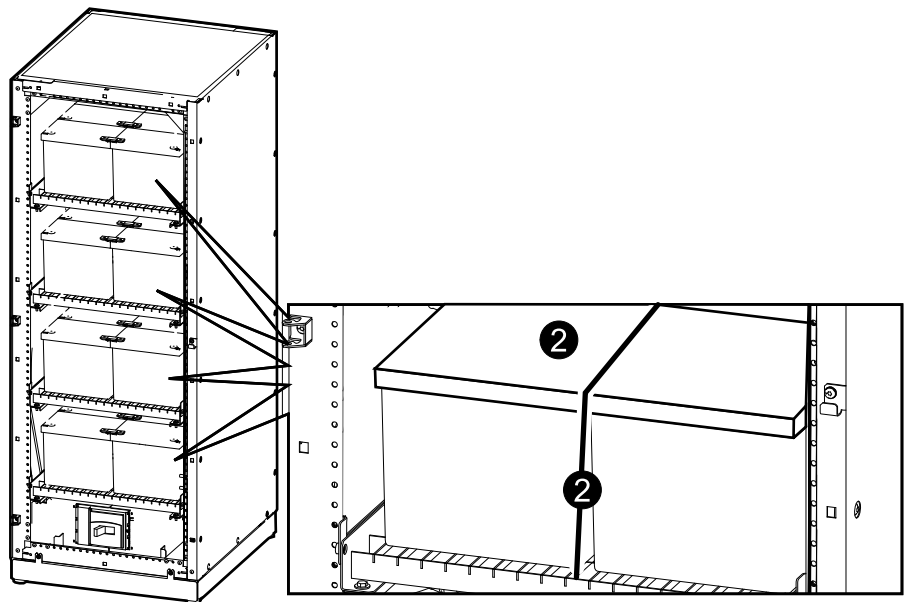
⚠ WARNING

HAZARD OF ELECTRIC SHOCK

Transportation straps and paperboard must be removed from the battery before installation.

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

1. Remove the cable and copper bar kit from the cabinet and save for battery installation.
2. Remove the transportation straps and the paperboard from the batteries.



Install Classic Battery Cabinet

NOTE: Cables can only be routed through the bottom of the classic battery cabinet.

Connect the Battery Cables in the Classic Battery Cabinet

⚠ DANGER

HAZARD OF ELECTRIC SHOCK

The classic battery cabinet and the UPS must be earthed properly.

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

⚠ 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.
- Turn the battery circuit breakers OFF before connecting cables to the terminals.

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

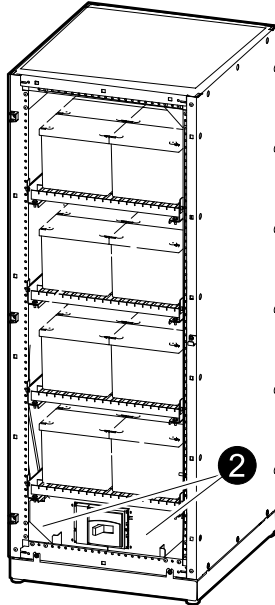
NOTE: For remote classic battery cabinets, the length of the signal cables must not exceed 50 m for the cable that connects the classic battery cabinet to the UPS. The length of the power cables must not exceed 200 m for the cable that connects the classic battery cabinet to the UPS. For power cables between 50 and 200 m, the voltage drop must be taken into account when the cable size is chosen. If the cables exceed the length limit this will result in erratic operation and reduced runtime.

Power cable size UPS-to-classic battery cabinet ¹⁵	150 mm ²
Power cable size classic battery cabinet-to-classic battery cabinet ¹⁵	95 mm ²
Power terminal bolt	10 mm (required tightening torque: 26 Nm)

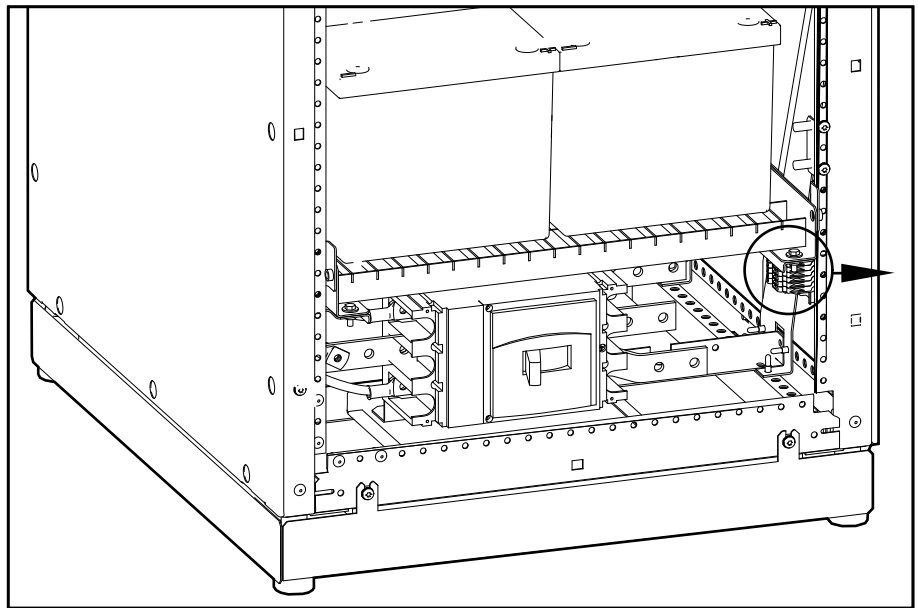
1. Connect the Protective Earth (PE) cable between the classic battery cabinet (s) and the UPS.

¹⁵. Note that these cables are not supplied

- Remove the two protection covers on the battery circuit breaker in the classic battery cabinet(s).



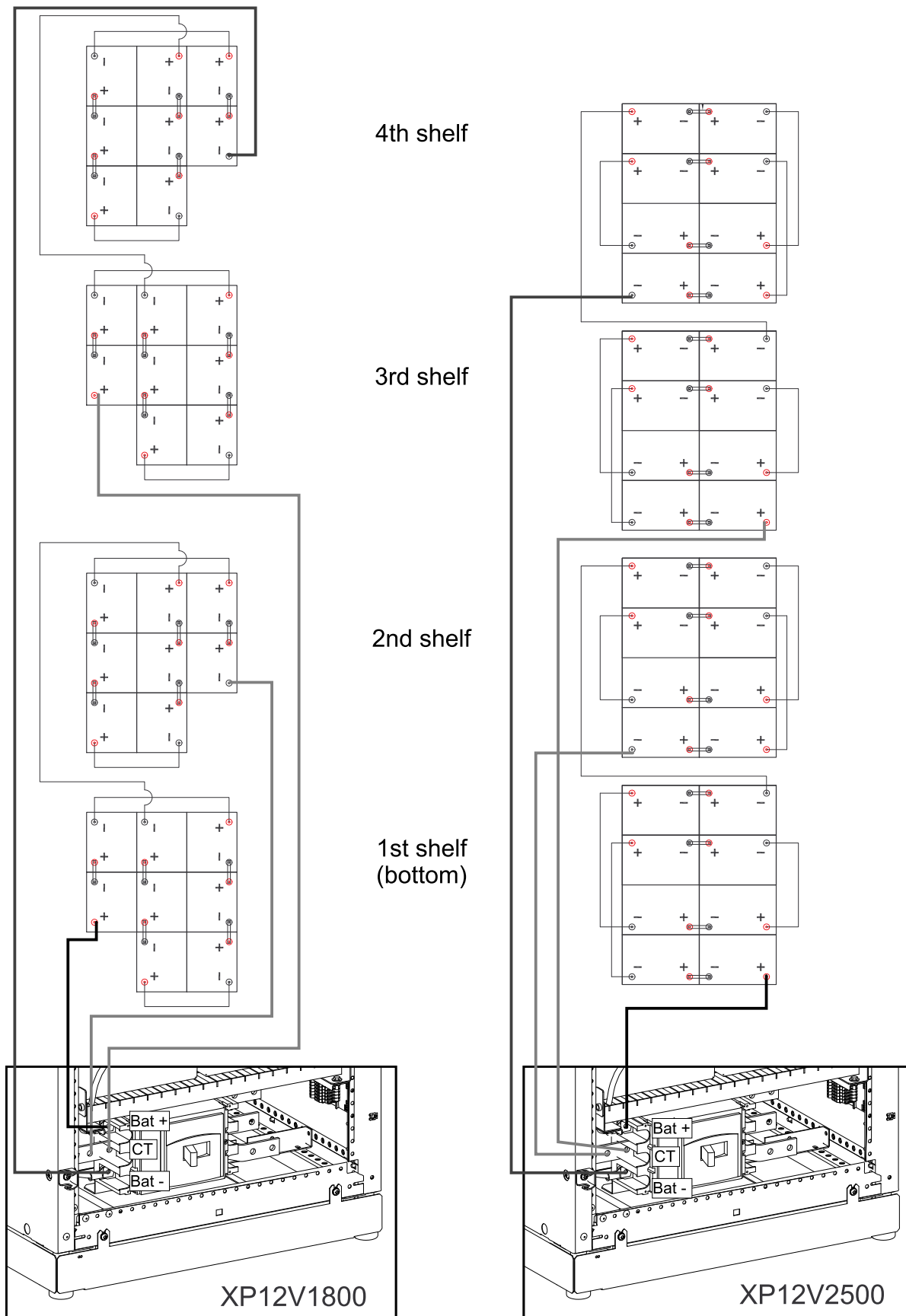
- Remove the screws securing the sheet metal plate and the terminal block in the right side of the battery cabinet(s) and remove them.



NOTE: Taking the sheet metal plate and the terminal block out of the cabinet for cable installation is not mandatory, but makes the cable installation easier due to limited space inside the cabinet.

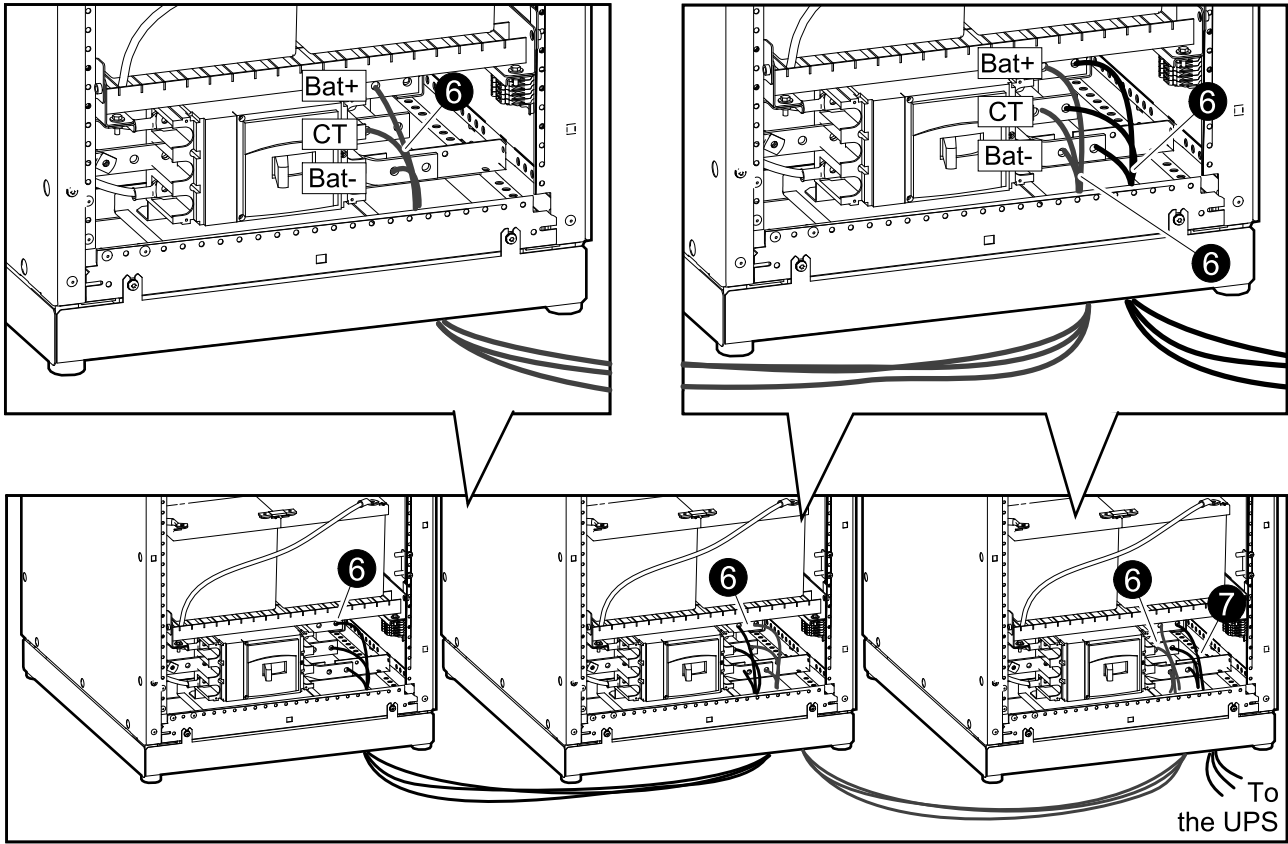
- Connect the copper busbar (supplied) between the batteries on the shelves as shown in the illustration (20 busbars for XP12V1800 batteries and 16 busbars for XP12V2500 batteries).

- 5. Connect the BAT+, BAT-, and CT (midpoint) battery cables (supplied) from the batteries on the shelves to the battery circuit breaker in the classic battery cabinet(s) as shown in the illustration.

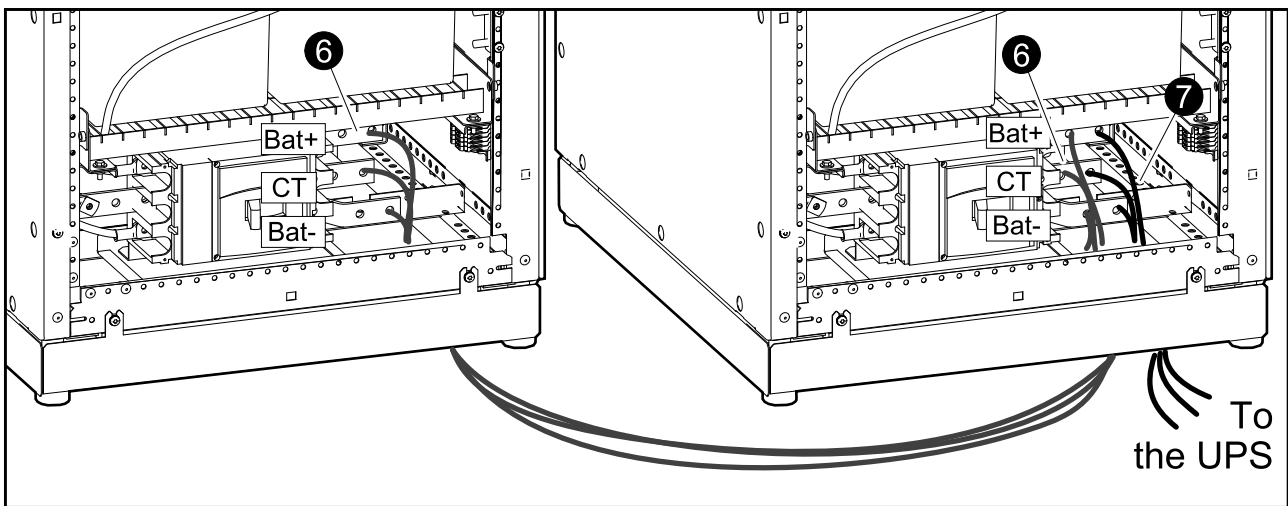


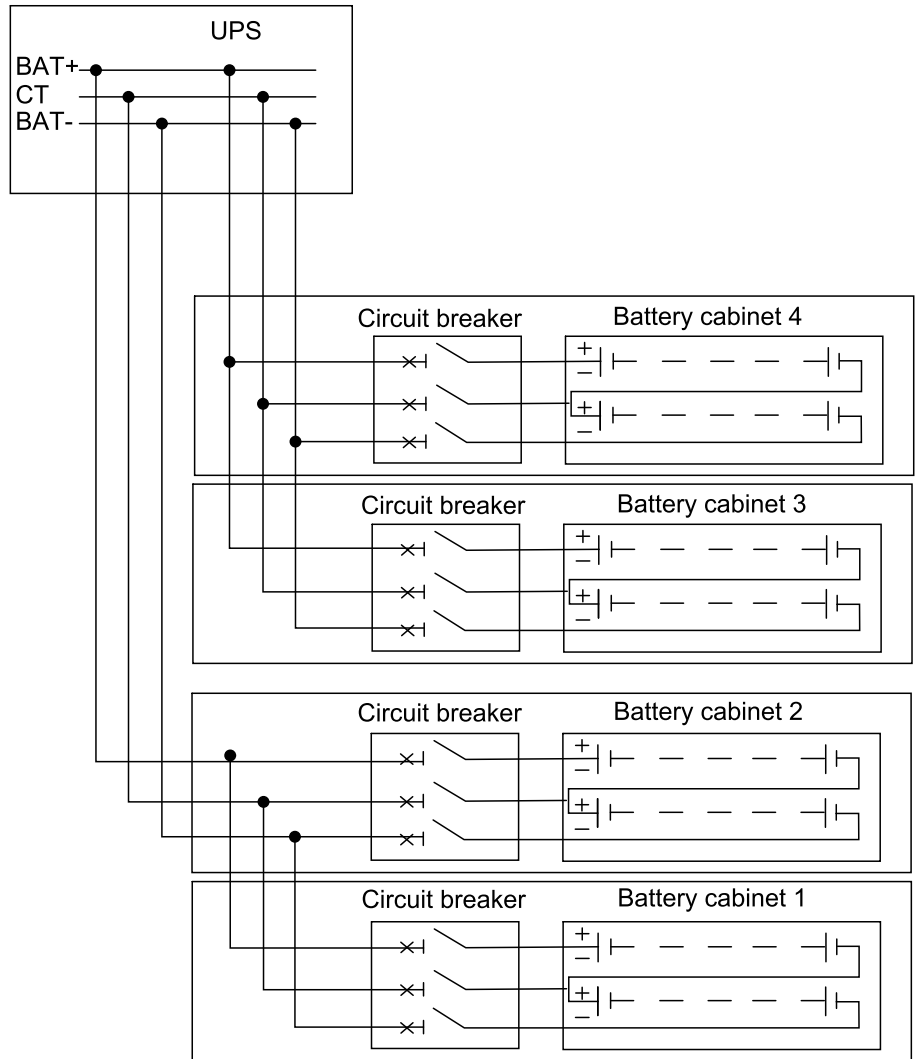
- 6. **If more than one classic battery cabinet is installed:** Connect the BAT+, BAT-, and CT (midpoint) cables between the classic battery cabinets in a parallel connection (output to output) in groups of two or three. Up to four classic battery cabinets in total can be connected to the UPS.

Installation with three classic battery cabinets



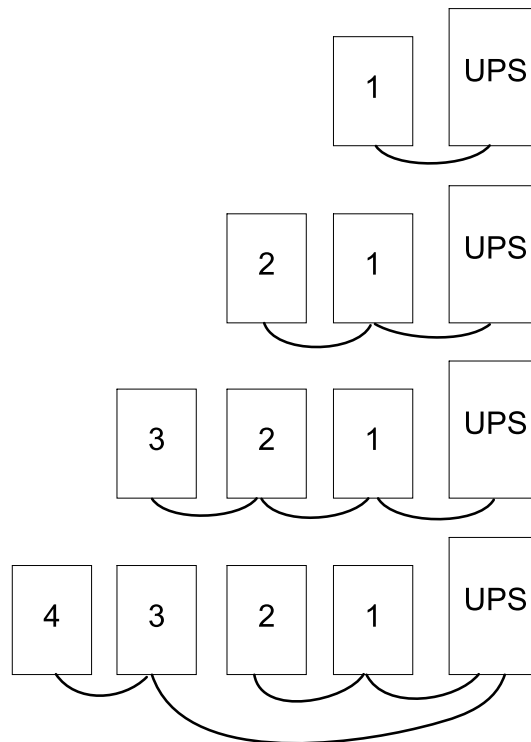
Installation with two or four classic battery cabinets





- Connect the BAT+, BAT-, and CT battery cables to the OUTPUT of the battery circuit breaker in the classic battery cabinet that will be connected to the UPS and route these cables through the bottom of the classic battery cabinet. Fasten the cables to the bottom sheet metal of the cabinet with cable ties.

Connection of power cables between UPS and classic battery cabinets



NOTE: In installations with four battery cabinets, there will be two battery cable sets (one from each classic battery cabinet group) to connect to the UPS.

- Reinstall the sheet metal plate and the terminal block in the right side of the battery cabinet(s) with the screws, if removed earlier.

Connect the Signal Cables with Only One Classic Battery Cabinet Installed

NOTE: A 5 meter signal cable is supplied. If a longer signal cable is needed, use the supplied signal cable as reference for making a new one.

1. Remove the right bottom protection cover to access the terminal block located on the right inside the classic battery cabinet.

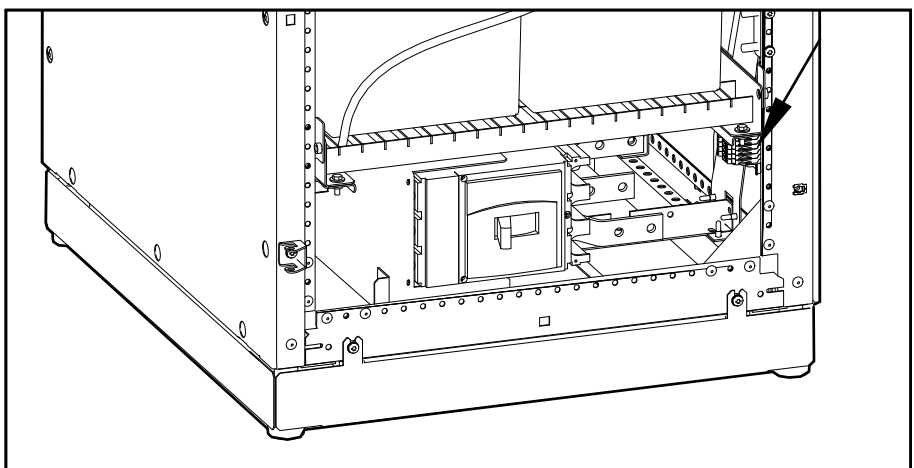
⚠ DANGER

HAZARD OF ELECTRICAL SHOCK, EXPLOSION, OR ARC FLASH

Live busbars are present behind the protection cover.

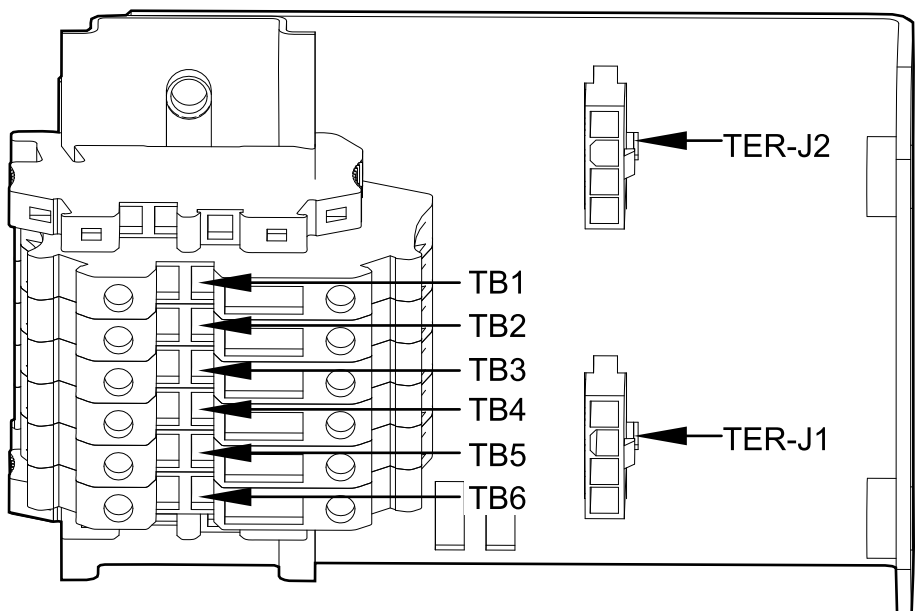
Failure to follow these instructions will result in death or serious injury.

Front View of Classic Battery Cabinet



2. Run the signal cable from the classic battery cabinet terminal block (Ter J1) to the PCBA board (0P4123 J27) in the UPS.

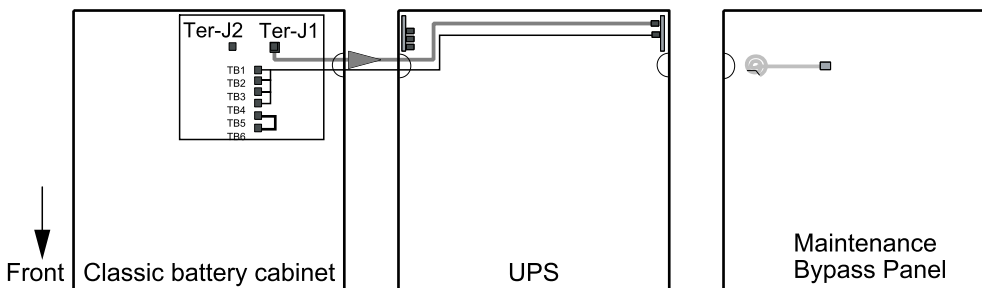
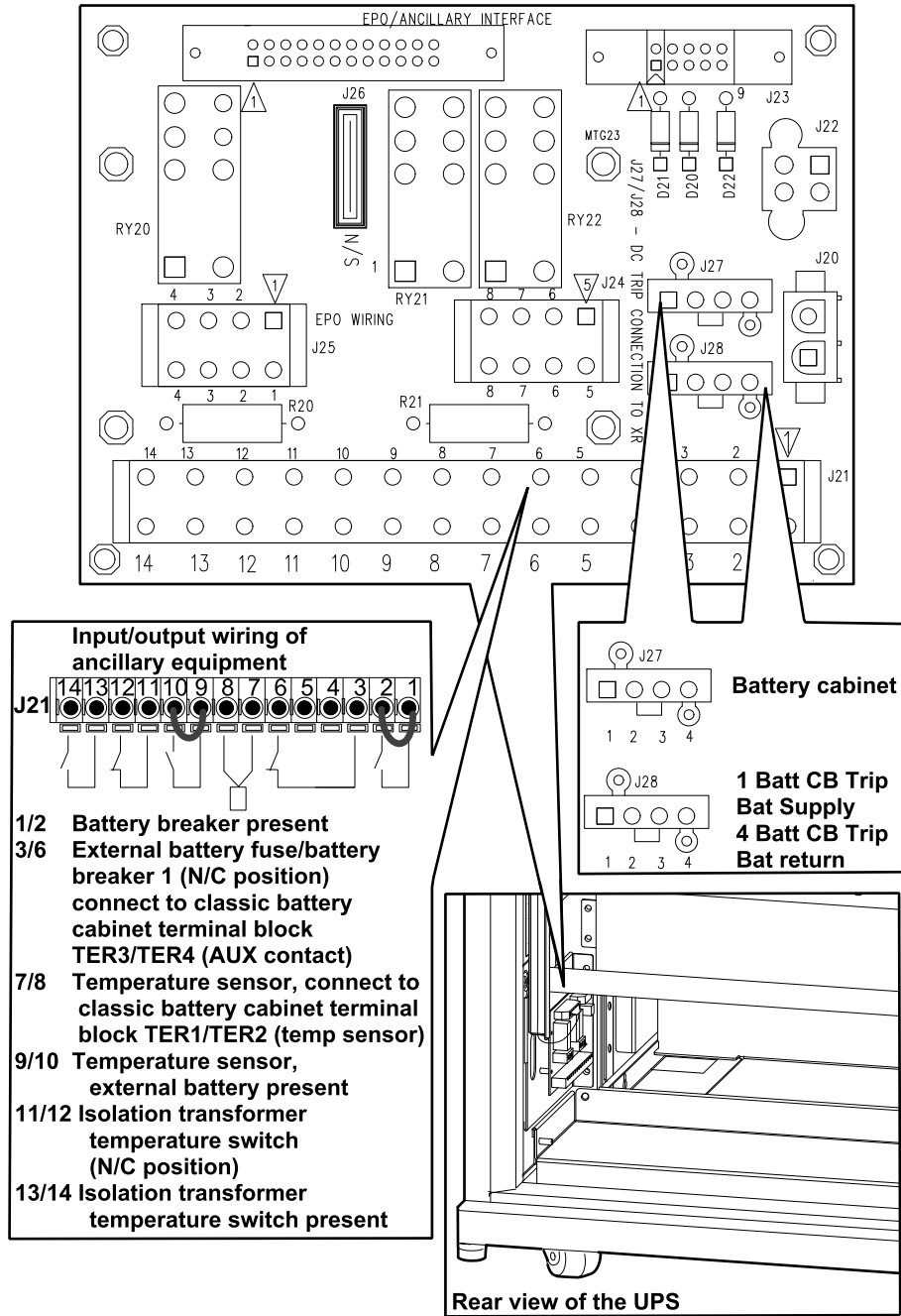
Overview of Terminal Block in Classic Battery Cabinet



3. Run the signal cable from the classic battery cabinet terminal block (TB1, TB2, TB3, TB4) to the PCBA board terminal ports (J21/7, J21/8, J21/3, J21/6) in the UPS. Terminal tightening torque is 0.6 Nm.

NOTE: Check that the preinstalled temperature sensor is connected to TB1 (red cable) and TB2 (black cable).

4. Connect the UPS terminal ports J21/1 to J21/2 with a jumper and J21/9 to J21/10 with a jumper.



5. Fasten the signal cables to the bottom sheet metal in the classic battery cabinet and to the UPS plate relief with cable ties.

6. Reinstall the right bottom protection cover.

Connect the Signal Cables with Multiple Classic Battery Cabinets Installed

NOTE: A 5 meter signal cable is supplied. If a longer signal cable is needed, use the supplied signal cable as reference for making a new one.

1. The terminal block is located on the right inside the classic battery cabinet behind the right bottom protection cover.

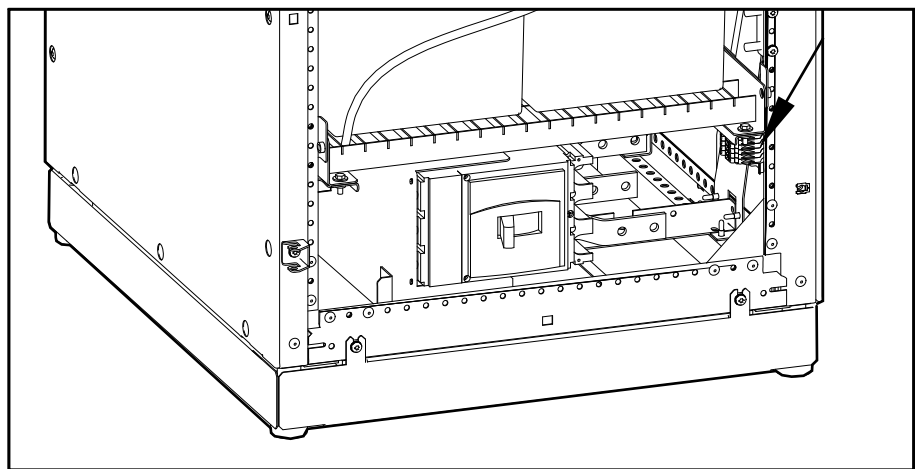
⚠ DANGER

HAZARD OF ELECTRICAL SHOCK, EXPLOSION, OR ARC FLASH

Live busbars are present behind the protection cover.

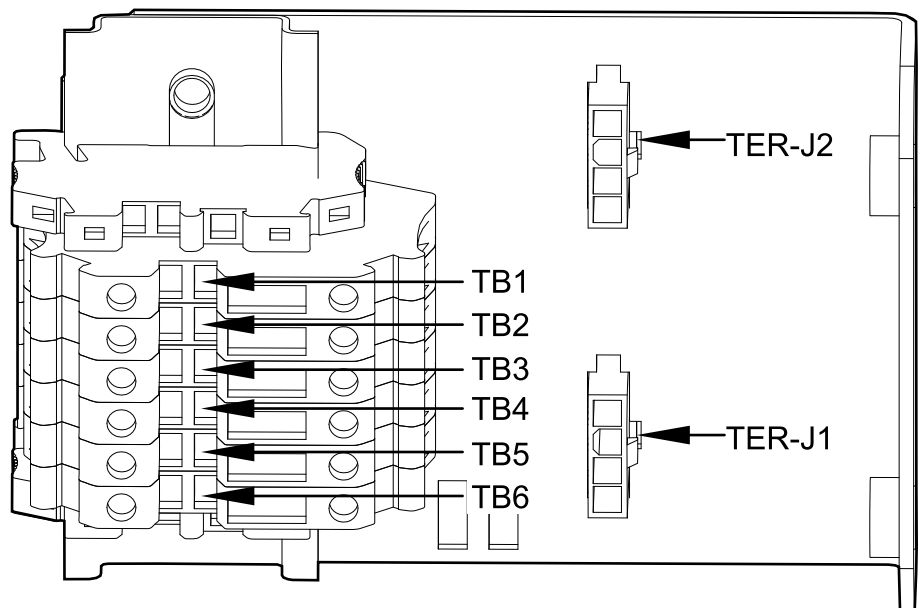
Failure to follow these instructions will result in death or serious injury.

Front View of Classic Battery Cabinet



2. Remove the jumper (TB5 to TB6) on all the classic battery cabinets except for the classic battery cabinet located farthest away from the UPS.

Overview of Terminal Block in Classic Battery Cabinet

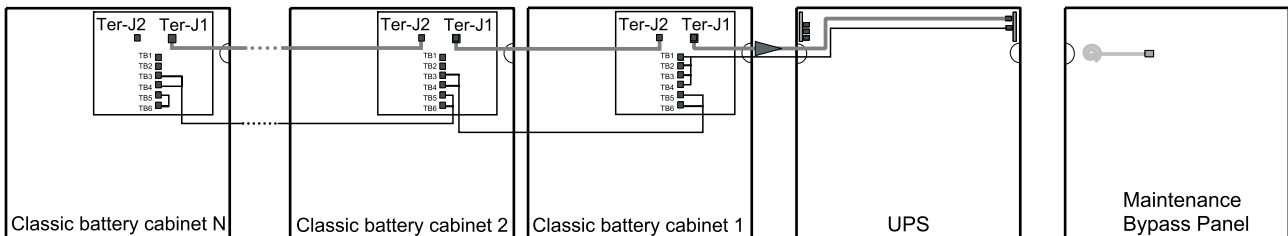
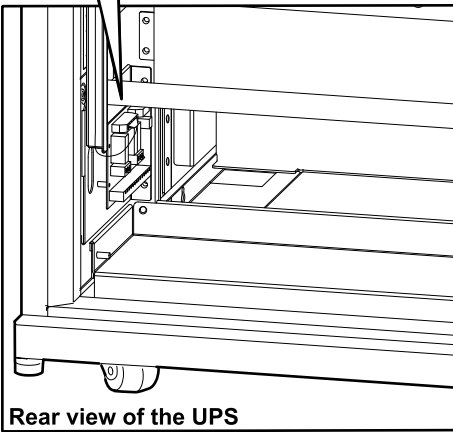
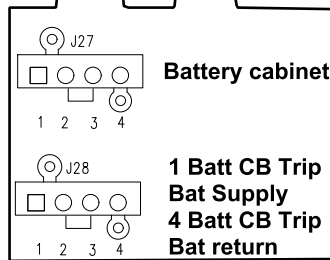
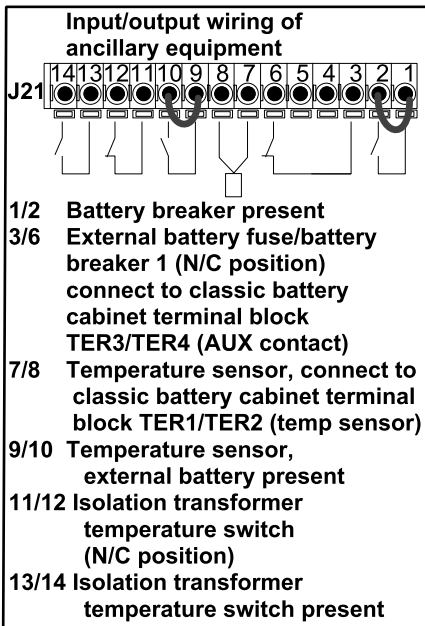
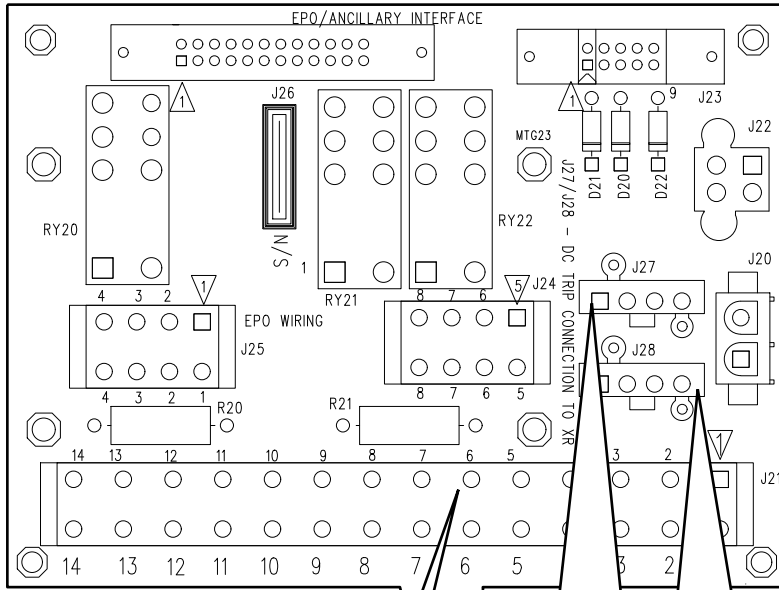


3. Run the signal cable from the terminal block (TB6,TB5) in classic battery cabinet 1 to the terminal block (TB3,TB4) in classic battery cabinet 2.
 - a. For more than two classic battery cabinets installed: Run the signal cable from the terminal block (TB6,TB5) on classic battery cabinet 2 to the terminal block (TB3,TB4) in classic battery cabinet 3. Continue connecting the classic battery cabinets this way until all are connected.
4. Run the cable from the terminal block (Ter J2) in classic battery cabinet 1 to terminal block (Ter J1) in classic battery cabinet 2.
 - a. For more than two classic battery cabinets installed: Run the signal cable from the terminal block (Ter J2) in classic battery cabinet 2 to the terminal block (Ter J1) in classic battery cabinet 3. Continue connecting the classic battery cabinets this way until all are connected.
5. Run the cable from the terminal block (Ter J1) in classic battery cabinet 1 to the PCBA board (0P4123 J27) in the UPS.
6. Run the cable from the terminal block (TB1,TB2,TB3,TB4) in classic battery cabinet 1 to the PCBA board terminal ports (J21/7,J21/8,J21/3,J21/6) in the UPS .

NOTE: Check that the preinstalled temperature sensor is connected to TB1 (red cable) and TB2 (black cable).

7. Connect the UPS terminal ports J21/1 to J21/2 with a jumper and J21/9 to J21/10 with a jumper.

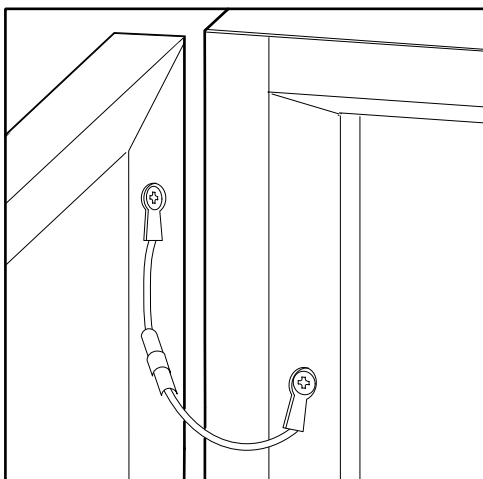
Top View of Cabinets



8. Secure the signal cables to the bottom sheet metal in the classic battery cabinets and to the UPS plate relief with cable ties.
9. Reinstall the right bottom protection covers.

Post-Installation Checklist

- If modular battery cabinets are installed, make sure that all DC breakers are in the OFF position.
- If classic battery cabinets are installed, make sure that all DC breakers are in the OFF position.
- Check that the power wiring is properly torqued: UPS = 230 lbf in/26 Nm, PDU with modular batteries = 550 lbf in/62 Nm, and modular battery cabinet = 274 lbf in/31 Nm.
- Verify clockwise phase-rotation (L1, L2, L3) and make sure a neutral connection is present.
- Leave a wiring diagram on site for service personnel.
- Reinstall all wiring access panels on the UPS.
- Reinstall all protection covers on the battery circuit breaker in the classic battery cabinets.
- Remount the doors on all cabinets and connect the ground cables between the front doors and the frames.



- For any optional equipment, refer to product-specific manuals.

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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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