

Galaxy 7000

250–500 kVA UPS

Installation

03/2018



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

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

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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.

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.

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 UL 1778 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):

<p style="text-align: center;">⚠ DANGER</p> <p>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</p> <p>Risk of Voltage Backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth.</p> <p>Failure to follow these instructions will result in death or serious injury.</p>
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Periodical Check

<p style="text-align: center;">⚠ WARNING</p> <p>HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH</p> <ul style="list-style-type: none">• 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. <p>This periodical check is recommended every 6 months and required every 12 months.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>
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Battery Safety

<p style="text-align: center;">⚠ DANGER</p> <p>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</p> <ul style="list-style-type: none">• 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. <p>Failure to follow these instructions will result in death or serious injury.</p>

⚠ 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.

Specifications

Input Specifications

	250 kVA				300 kVA				400 kVA				500 kVA			
Voltage (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
Nominal input current (A) ¹	369	351	337	319	441	420	403	382	586	558	536	507	735	700	672	636
Connections	L1, L2, L3															
Frequency (Hz)	45 to 66															
Total Harmonic Distortion (THDI)	< 5% at full load															
Input power factor correction	> 0.99 at load > 50%															

Bypass Specifications

	250 kVA				300 kVA				400 kVA				500 kVA			
	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
Nominal input current (A)	379	361	347	328	455	433	417	393	607	577	556	524	759	722	695	656
Connections	4-wire (L1, L2, L3 + N + PE)															
Frequency (Hz)	45 to 66															

Output Specifications

	250 kVA				300 kVA				400 kVA				500 kVA			
Voltage (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
Nominal output current (A)	379	361	347	328	455	433	417	393	607	577	556	524	759	722	695	656
Connections	4-wire (L1, L2, L3 + N + PE)															
Output capacity	150% for 30 seconds (normal operation) 125% for 10 minutes (normal operation)															
Output frequency (sync to mains) (Hz)	50/60 ± 0.1															
Slew rate (Hz/Sec)	2															
Total Harmonic Distortion (THDU)	< 2% ph/ph															
Output power factor	0.9															
Dynamic load response	± 1%															
Output voltage regulation	± 1%															
Crest factor	2.7	2.9	3.0	3.3	2.3	2.4	2.5	2.8	2.3	2.4	2.5	2.8	2.6	2.7	2.8	3.0

1. For 400 V interphase voltages and a load with a power factor of 0.9.

Battery Specifications

Type	Sealed lead-acid	Vented lead-acid	Ni-Cad
Min./Max. number of cells	264 / 288	264 / 288	422 / 468
Floating voltage per cell (V)	2.27	2.2	1.4
Min./Max. floating voltage (V)	600 / 654	581 / 634	600 / 655
Equalising voltage per cell (V)	Not applicable	2.4	1.5
Boost voltage per cell (V)	Not applicable	2.25	1.45
Min. voltage per cell (V)	1.65 to 1.9	1.65 to 1.9	1
Recharge current	0.1 x C10	0.1 x C10	0.2 C5

End of Discharge Current

	Sealed lead-acid	Vented lead-acid	Ni-Cad
250 kVA	548/502	548/502	566/509
300 kVA	659/604	659/604	680/612
400 kVA	874/801	874/801	902/812
500 kVA	1090/999	1090/999	1125/1012

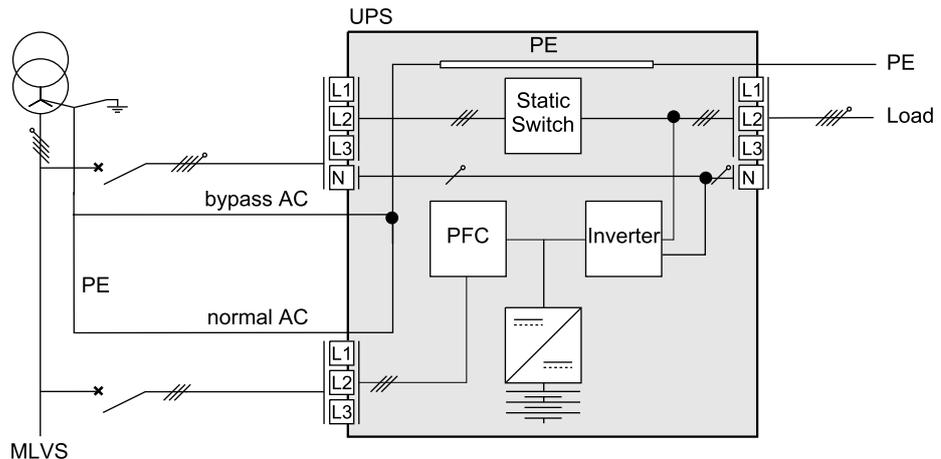
NOTE: The battery current is an average current Pn with a power factor of 0.9

Earthing Systems

This section lists the main earthing systems and their wiring requirements. For earthing systems not listed here, please contact Schneider Electric.

TNS upstream, TNS downstream without Residual-Current Protection

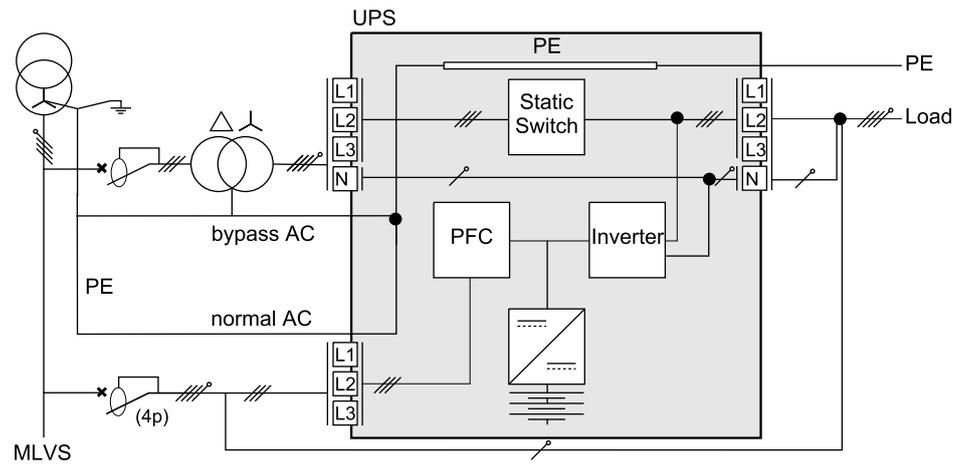
For separate normal and bypass AC lines from a single source. For UPS used as frequency converter, please contact Schneider Electric.



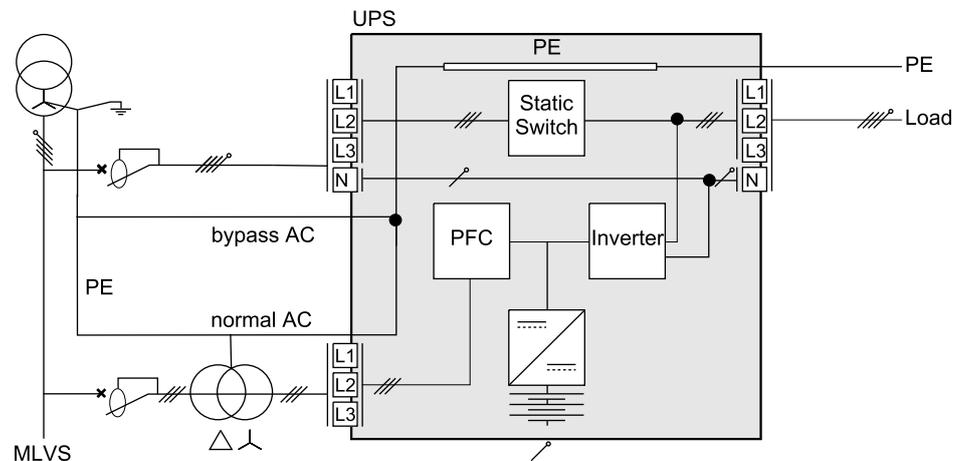
TNS upstream, TNS downstream with Residual-Current Protection

Galvanic isolation between the normal and bypass AC lines is mandatory. The recommended minimum residual current protection is 3A (IEC364.4-41).

Transformer on bypass AC network



Transformer on normal AC network



NOTE: Adding a transformer into the Normal AC network reduces the installation's overall efficiency.

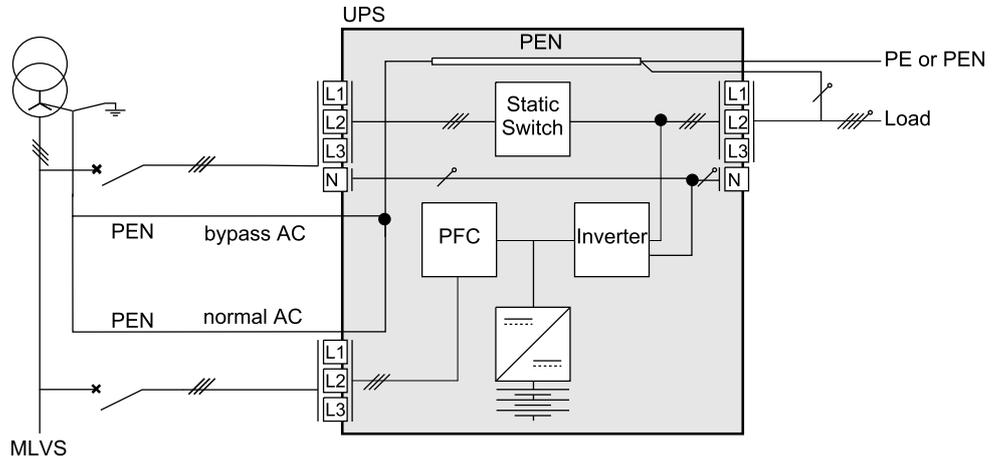
TNC upstream, TNC, TNS or TT downstream installation

For separate normal and bypass AC lines from a single source.

For UPS, static switch or external bypass cabinets:

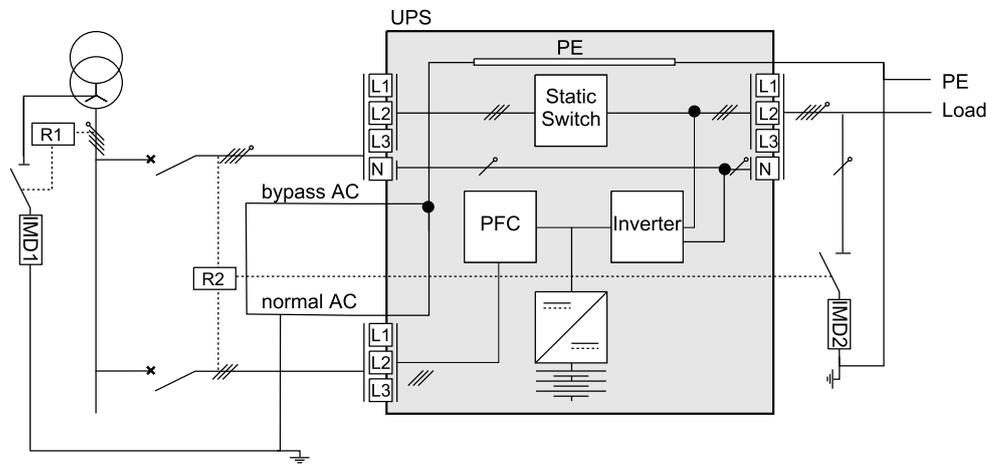
- transform the internal PE bar into a PEN bar, see *Adapt Cabinet for Neutral Point Connection*, page 37
- connect the output neutral to the internal PEN bar.
- connect cabinets outputs in TNC (Connect the PEN cable to the PEN bar)
- do not use load neutral terminal

The downstream SEA, TNS or TT starts on the installation output.



IT upstream, IT downstream

For separate normal and bypass AC lines from a single source.



In normal operating mode:

- The IMD1 controls the whole installation, including downstream from the UPS.
- Power to the IMD2 is switched off by the R2 relay which controls voltage presence upstream from the UPS.

If the voltage is cut or the protection is opened upstream:

- The R1 relay cuts the IMD1 circuit.
- The R2 relay closes the IMD2 circuit thus maintaining control downstream of the UPS.

Recommended Cable Sizes

Power Cables for Single UPS

AC cable sizes are determined for the TNS system and for the following cable characteristics:

- copper single-core cables, type U1000 R02V
- maximum length 100 m with a line voltage drop <3%
- installation on perforated cable trays
- XLPE-type insulation, single-layer trefoil formation
- THDI between 15% and 33%
- 35°C, at 400 V
- grouped by four cables.

Battery cable sizes are determined for:

- installation on perforated metallic grounded cable trays,
- copper, single-core cables, type U1000 R02V,
- maximum length 25 m with a line voltage drop <1%.

UPS rating	Minimum size (mm ²)			
	Normal AC line	Bypass AC line	Load	Battery
250 kVA	1 x 150	1 x 150	1 x 150	1 x 150
300 kVA	1 x 240	1 x 240	1 x 240	1 x 185
400 kVA	2 x 150	2 x 150	2 x 150	1 x 240
500 kVA	2 x 240	2 x 240	2 x 240	2 x 150 ²

Power Cables for Parallel UPSs

Normal AC Line and Battery

AC cable sizes are determined for the TNS system and for the following cable characteristics:

- copper single-core cables, type U1000 R02V
- maximum length 100 m with a line voltage drop <3%
- installation on perforated cable trays
- XLPE-type insulation, single-layer trefoil formation
- THDI between 15% and 33%
- 35°C, at 400 V
- grouped by four cables.

Battery cable sizes are determined for:

- installation on perforated metallic grounded cable trays,
- copper, single-core cables, type U1000 R02V,
- maximum length 25 m with a line voltage drop <1%.

NOTE: Important: For > 200 kVA UPS, the output cables must be at least 6 metres long ($L \geq 6$ m).

UPS rating	Minimum size (mm ²)	
	Normal AC line	Battery
250 kVA	1 x 150	1 x 150
300 kVA	1 x 240	1 x 185
400 kVA	2 x 150	1 x 240
500 kVA	2 x 240	2 x 150 ²

Bypass AC Line and Load

UPS rating	Number of UPSs	Total power rating (kVA)	Current on AC bypass or load (A)	Minimum size for AC bypass or load (mm ²)
250 kVA	2	250	361	1 x 150
300 kVA	2	300	433	1 x 240
400 kVA	2	400	577	2 x 150
500 kVA	2	500	722	2 x 240

2. Per battery cabinet.

Frequency Converters

UPS rating	Number of UPSs	Total power rating (kVA)	Current on AC bypass or load (A)	Minimum size for load (mm ²)
250 kVA	2	250	361	1 x 150
300 kVA	2	300	433	1 x 240
400 kVA	2	400	577	2 x 150
500 kVA	2	500	722	2 x 240

NOTE: The power cables between the UPS units and the upstream protective devices must be of the same size and length.

NOTE: The power cables between the UPS units and the load must be of the same size and length.

Integrated Parallel UPS Units with External Bypass Cabinet

UPS rating	Number of UPSs	Total power rating (kVA) ³	Current on AC bypass or load (A)	Minimum size for load (mm ²)
250 kVA	2	500	722	2 x 185
	3	750	1083	3 x 300
	4	1000	1443	4 x 240
300 kVA	2	600	866	2 x 240
	3	900	1300	4 x 240
	4	1200	1732	4 x 300
400 kVA	2	400	1154	4 x 185
	3	1200	1732	4 x 300
	4	1600	2308	4 x 500
500 kVA	2	500	1433	4 x 240
	3	1500	2165	4 x 500
	4	2000	2886	Consult us ⁴

NOTE: The power cables between the UPS units and the upstream protective devices must be of the same size and length.

NOTE: The power cables between the UPS units and the load must be of the same size and length.

Parallel UPS Units with Static-Switch Cabinet (SSC)

UPS rating	Number of UPS	Total power rating ³ (kVA)	Current on AC bypass or load (A)	Minimum size for load (mm ²)
250 kVA	2	500	722	2 x 185
	3	750	1083	3 x 300
	4	1000	1443	4 x 240
300 kVA	2	600	866	2 x 240
	3	900	1300	4 x 240
	4	1200	1732	4 x 300
400 kVA	2	400	1154	4 x 185
	3	1200	1732	4 x 300
	4	1600	2308	4 x 500
500 kVA	2	500	1433	4 x 240
	3	1500	2165	4 x 500

3. Not including redundant UPS units.

4. Standard NFC15–100 limits the number of cables to four.

UPS rating	Number of UPS	Total power rating ⁵ (kVA)	Current on AC bypass or load (A)	Minimum size for load (mm ²)
	4	2000	2886	Consult us ⁵

NOTE: The power cables between the UPS units and the upstream protective devices must be of the same size and length.

NOTE: The power cables between the UPS units and the load must be of the same size and length.

Connection Terminals

UPS Cabinets

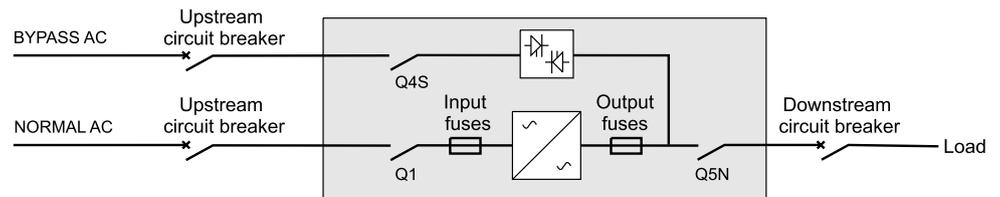
UPS rating	Phase terminal		Earth terminal	Battery terminal
	Type of stud	Number of holes x diameter (mm)		
250 — 400 kVA	2 x M10 ⁶	1 x 10	5 x 13	3 x 13
500 kVA	N/A	4 x 13	5 x 13	3 x 13

SSC, SSC Maintenance, External Bypass Cabinets

Cabinets	Phase terminal	Earth terminal
	Hole diameter (mm)	
800 kVA	13	13
1200 kVA	13	13
2000 kVA	13 and 17	13

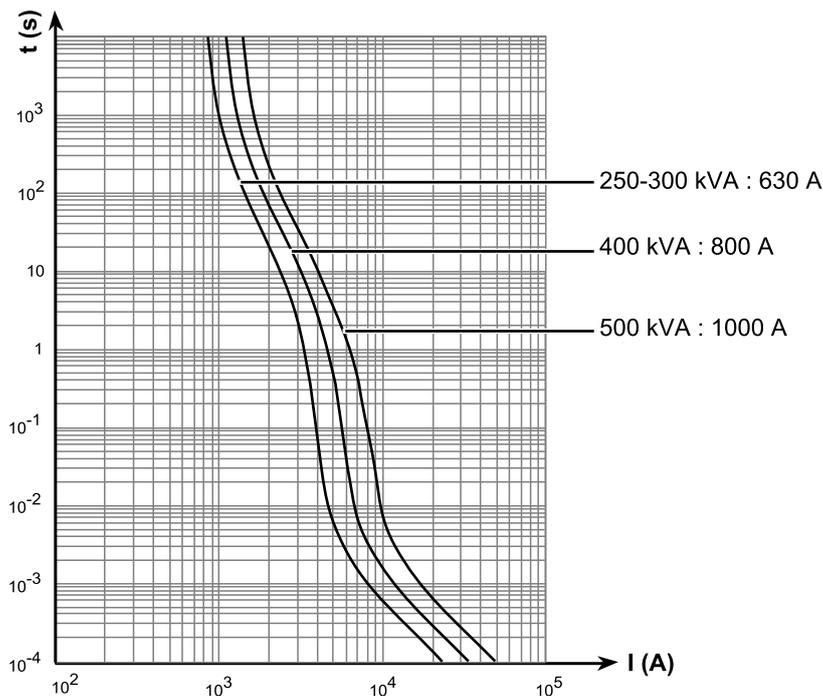
Recommended Upstream and Downstream Protection

Selection of Protection Devices



5. Not including redundant UPS units.
 5. Standard NFC15–100 limits the number of cables to four.
 6. Maximum tightening torque 25 Nm.

Time/current Curves for UPS input and Output Fuses



UPS Output Current

UPS	250 kVA	300 kVA	400 kVA	500 kVA
In at 400 V (A)	361	433	577	722
I _{output maximum} ⁷ (A)	1030	1030	1374	1975
I _{output minimum} ⁷ (A)	793	793	1140	1470

Line-current Values

UPS	250 kVA	300 kVA	400 kVA	500 kVA
Continuous input current (A)	368	442	587	735
Input current at 1.25 I _n overload limited to 10 minutes (A)	441	530	706	881
Input current at 1.5 I _n overload limited to 30 seconds (A)	530	636	848	1058
Input / output fuse ratings (A)	630	630	800	1000

For U=400V and power factor=0.9.

Power Circuit Protection

UPS	250 kVA		300 kVA		400 kVA		500 kVA	
	CB	Trip Unit	CB	Trip Unit	CB	Trip Unit	CB	Trip Unit
Normal AC source	NSX 630N 3P	Micrologic 2.3	NSX 630N 3P	Micrologic 2.3	NS 800N 3P	Micrologic 2.0	NS 800N 3P	Micrologic 5.0
Bypass AC source	NSX 630N 4P	Micrologic 2.3	NSX 630N 4P	Micrologic 2.3	NS 800N 4P	Micrologic 2.0	NS 800N 4P	Micrologic 5.0
Output	NSX 100 N	TM D 80	NSX 100 N	TM D 80	NSX 100 N	TM D 100	C125N	D 125
	C120N	C80	C120N	C80	NG 125N	C 125	NSX 160N	TM 160D

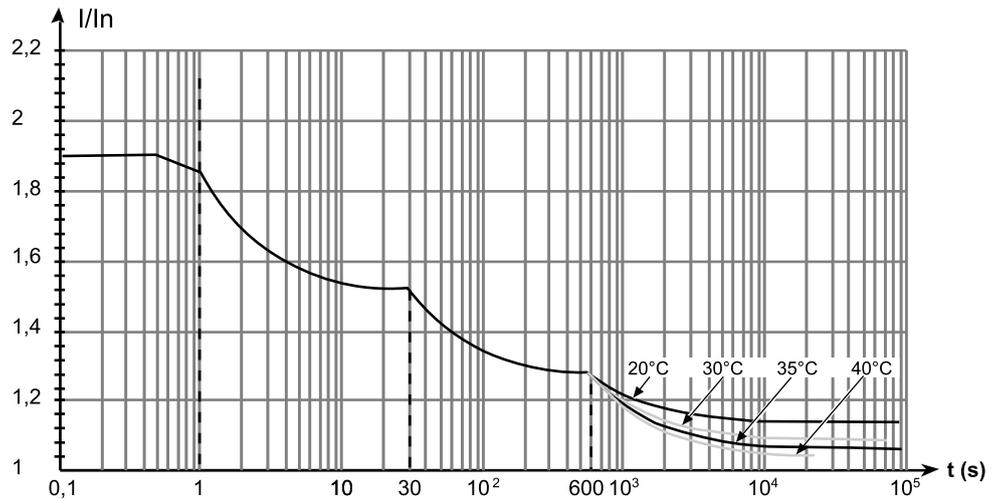
7. RMS current limit when inverter is coupled and bypass AC source is out of tolerances

UPS	250 kVA		300 kVA		400 kVA		500 kVA	
	CB	Trip Unit						
	C120N	B 125	C120N	B 125	C125H	C 125	NG125N	D125
I_{cw}^8 (kA)	26.7						22	

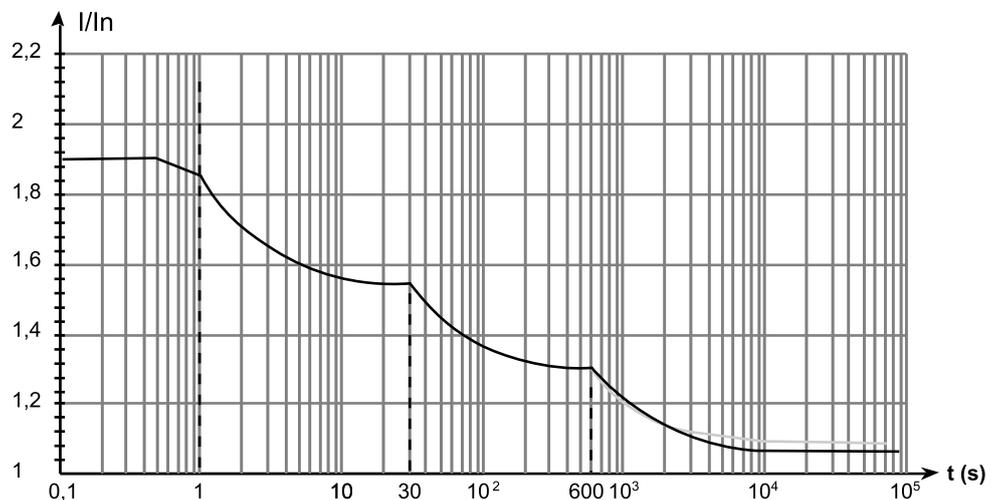
NOTE: If these downstream protection recommendations are not followed, a short-circuit on an output circuit can result in a break in power longer than 20 ms on all the other output circuits.

Permissible UPS overloads as a Function of Time

Normal Mode Operation



Bypass AC Mode or Static Switch Operation



Recommended Residual Current Protection

Requirements for residual current protection:

For single mains:

- The same residual current protection can be used for input and bypass.

For dual mains:

- A transformer is required upstream of either the input or bypass.

8. RMS shorttime current value that can be carried without damage under condition defined by the standard IEC 62040-1.

- Equip each source with a circuit breaker or switch with residual current protection.

The recommended minimum residual current protection is 3 A, provided the conditions defined in IEC60364-4-61 are complied with.

Battery Breaker Box Configurations

⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
The battery breaker box must only be used with the Galaxy 7000 UPS.
Failure to follow these instructions will result in death or serious injury.

⚠ WARNING
HAZARD OF FIRE OR ARC FLASH
<ul style="list-style-type: none"> The battery breaker box must be connected as described in this manual. The undervoltage coil must be wired to the UPS as shown on the diagrams.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The below battery solutions can be made of several strings in parallel. All strings must be identical: same element block and the same number of blocks.

The below battery configurations and settings are based on nominal power at a power factor of 0.9 and 264 lead battery cells. For other battery configurations please contact Schneider Electric.

Battery Configurations with One Battery Breaker (QF1)

UPS	Battery Backup Time Minutes	QF1 (NSX500S TM-DC)	
		Battery Strings	Thermal/Magnetic Setting (A)
250 kVA	< 90	1	500/1250
300 kVA	< 10	1	500/1250

Battery Configurations with Two Battery Breakers (QF1)

UPS	Battery Backup Time Minutes	Total Number of Battery Strings	QF1-1 (NSX500S TM-DC)		QF1-2 (NSX500S TM-DC)	
			Battery Strings	Thermal/Magnetic Setting (A)	Battery Strings	Thermal/Magnetic Setting (A)
250 kVA	Any	2	1	500/1250	1	500/1250
		3	2	500/1250	1	500/1250
		4	2	500/1250	2	500/1250
		5	3	500/1250	2	500/1250
		6	3	500/1250	3	500/1250
300 kVA	Any	2	1	500/1250	1	500/1250
		3	2	500/1250	1	500/1250
		4	2	500/1250	2	500/1250
		5	3	500/1250	2	500/1250

UPS	Battery Backup Time Minutes	Total Number of Battery Strings	QF1-1 (NSX500S TM-DC)		QF1-2 (NSX500S TM-DC)	
			Battery Strings	Thermal/Magnetic Setting (A)	Battery Strings	Thermal/Magnetic Setting (A)
		6	3	500/1250	3	500/1250
400 kVA	< 90	2	1	500/1250	1	500/1250
		4	2	500/1250	2	500/1250
		6	3	500/1250	3	500/1250
500 kVA	< 20	2	1	500/1250	1	500/1250
		4	2	500/1250	2	500/1250
		6	3	500/1250	3	500/1250

Battery Configurations with Three Battery Breakers (QF1)

UPS	Battery Backup Time Minutes	Total Number of Battery Strings	QF1-1 (NSX500S TM-DC)		QF1-2 (NSX500S TM-DC)		QF1-3 (NSX500S TM-DC)	
			Battery Strings	Thermal/Magnetic Setting (A)	Battery Strings	Thermal/Magnetic Setting (A)	Battery Strings	Thermal/Magnetic Setting (A)
400 kVA	Any	3	1	500/1250	1	500/1250	1	500/1250
		5	2	500/1250	2	500/1250	1	500/1250
500 kVA	Any	3	1	500/1250	1	500/1250	1	500/1250
		5	2	500/1250	2	500/1250	1	500/1250
		6	2	500/1250	2	500/1250	2	500/1250

Environmental

Operating temperature	0 - 40 °C
Storage temperature with or without batteries	-25 - 45 °C dry heat
Operating relative humidity	20- 95%, non-condensing
Storage relative humidity	20- 95%, non-condensing
Operating elevation	0–1500 m: 85% load 1500–2000 m: 79% load 2000–2300 m: 75% load 2300–3000 m: 69% load 3000–4000 m: 59% load
Storage elevation	0-10000 meters
Audible noise according to ISO 3746 (NFS 31 027) 250-400 kVA 380/400/415/440 V 500 kVA 380/400/415/440 V	75 dBA 75 dBA
Protection class	From IP20 to IP32
Colour	Pearl dark grey (RAL 9023)

Heat Dissipation

	250 kVA		300 kVA		400 kVA		500 kVA	
	Batteries fully charged	Batteries charging						
Active power (kW)	112	225	135	270	180	360	225	450

	250 kVA		300 kVA		400 kVA		500 kVA	
	Batteries fully charged	Batteries charging						
Efficiency	93.2	93.8	93.5	93.6	94.1	94.1	94.3	94.3
Heat losses (kW)	8.2	14.9	9.4	18.6	11.3	22.6	13.6	27.2
Heat losses (calories/s)	1962	3554	2243	4449	2697	5395	3250	6501

Weights and Dimensions

UPS rating	Weight (kg)	Height (mm)	Width (mm)	Depth (mm)
250 kVA	990	1900	1412	855
300 kVA	990	1900	1412	855
400 kVA	1140	1900	1412	855
500 kVA	1500	1900	1812	855

Clearance

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

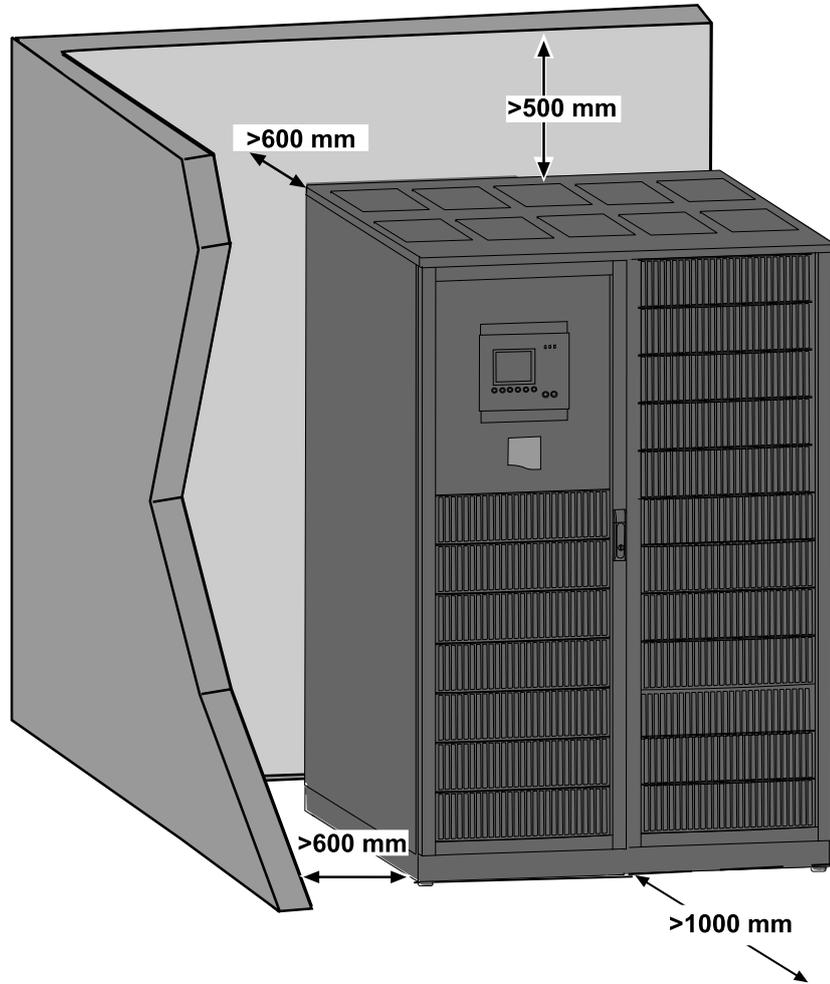
NOTE: The UPS system can be placed up against the wall. It is preferable to leave some space for easier maintenance.

NOTICE

HAZARD OF OVERHEATING

- Leave nothing on top of the UPS.
- Maintain 500 mm of free space above the UPS.
- Ensure that the UPS cabinet rests on its four cylindrical feet, (six feet for 500 kVA UPS).
- Ensure that the distance between the UPS rear panel and the floor is less than 10 mm.

Failure to follow these instructions can result in equipment damage.



NOTE: Leave one meter of free space in front of the UPS for door opening.

Introduction

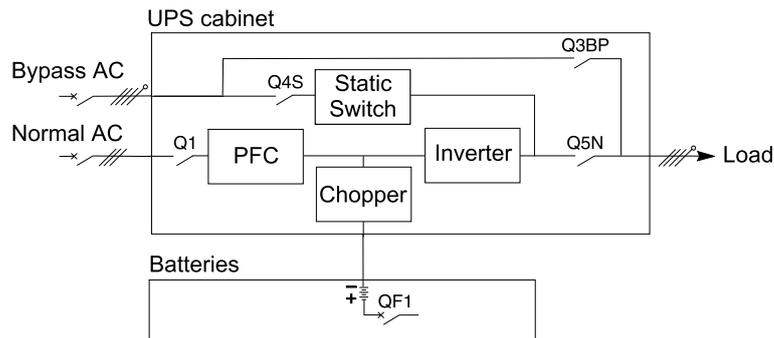
Switches and Breakers in the System

Q1	Unit input switch
Q3BP	Maintenance bypass breaker
Q3BP ext	System maintenance bypass breaker
Q4S	Static switch input switch
Q5N	Unit output breaker
Q5N ext	System isolation breaker
QF1	Battery breaker
QN	Static switch maintenance isolation breaker
QM	UPS units maintenance isolation breaker

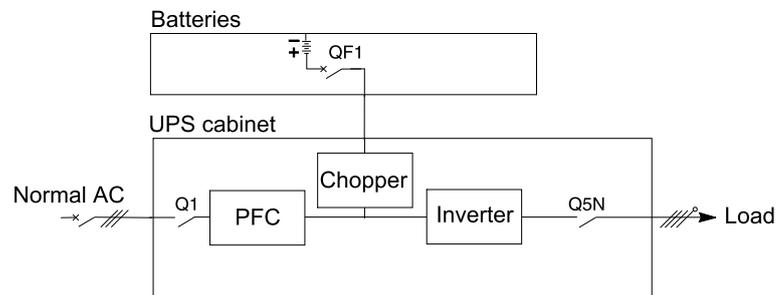
Overview of Configurations

Single Systems

Single or Integrated Parallel UPS alone



Single UPS Set Up as a Frequency Converter

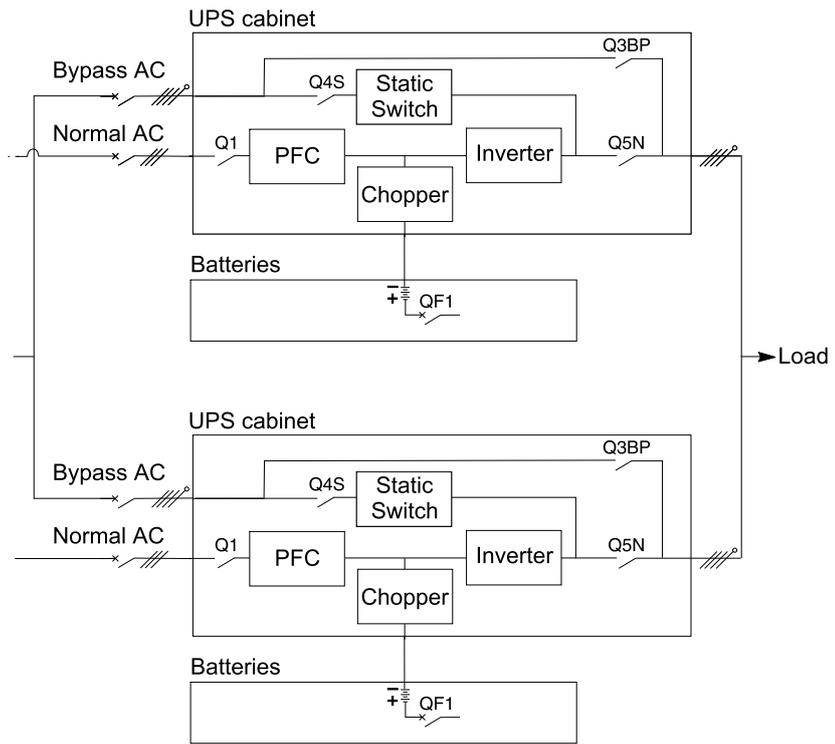


Parallel UPS Systems

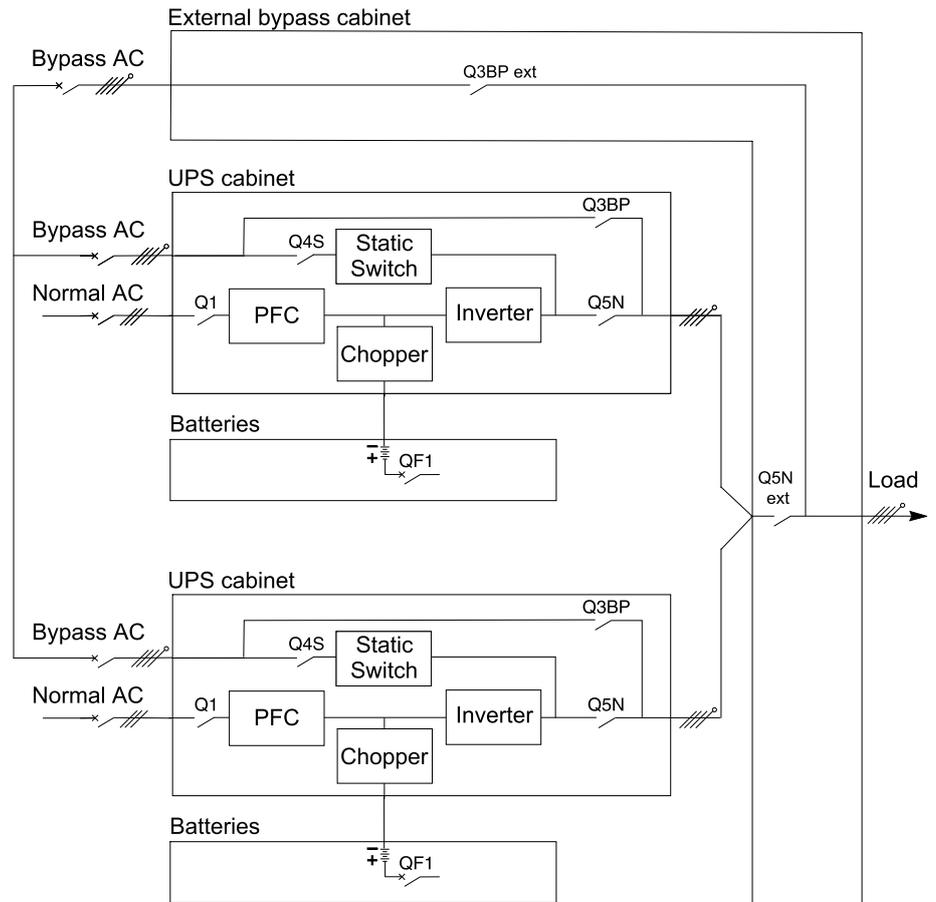
For a maximum of eight units.

Bypass AC are common to all parallel UPS units.

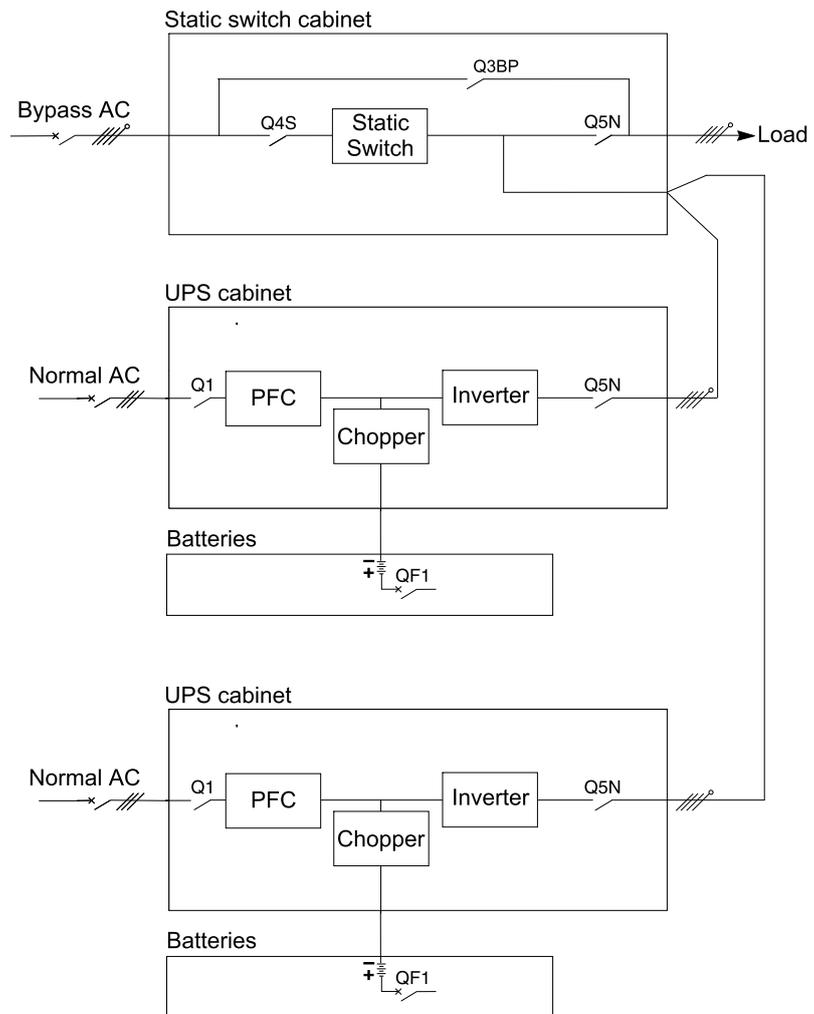
Integrated Parallel UPS units in Parallel



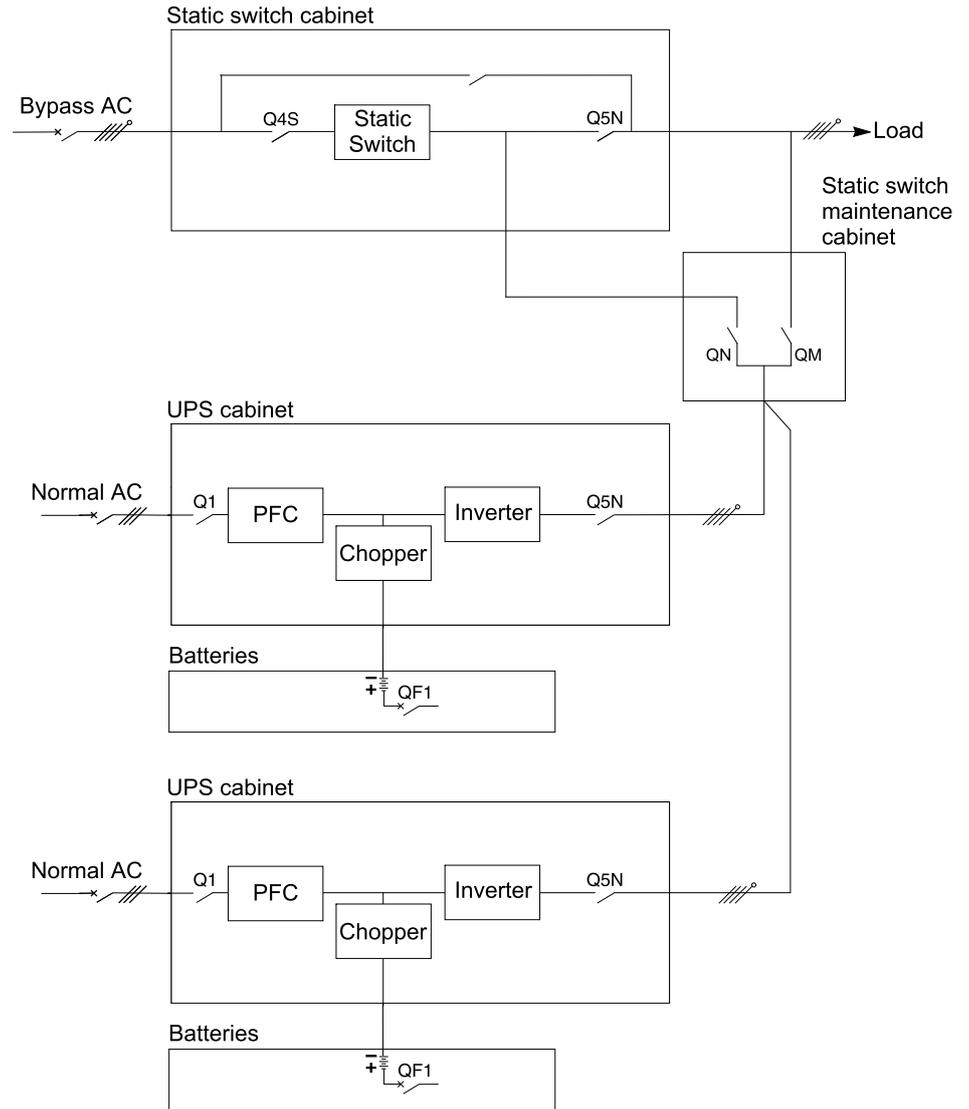
Integrated Parallel UPS units in Parallel with External Bypass Cabinet



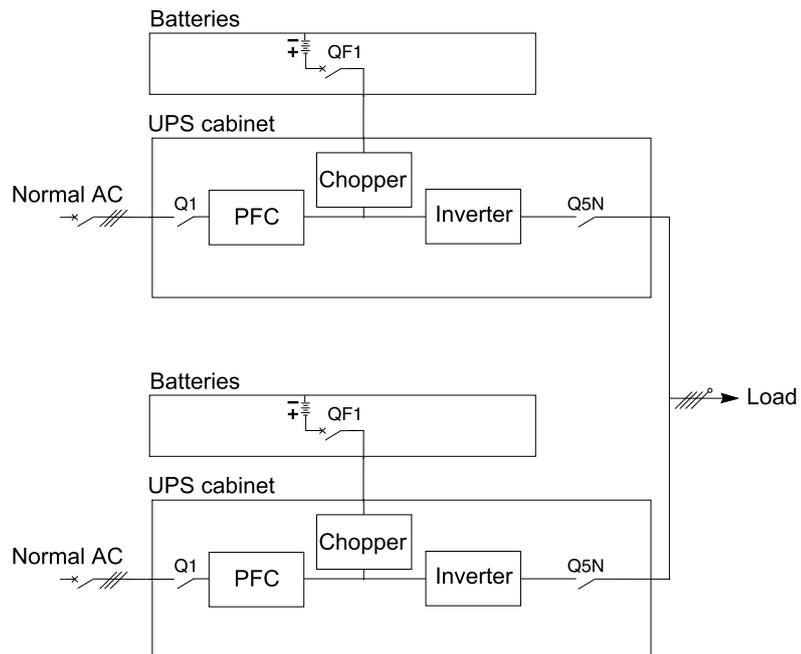
Parallel UPS units with Static Switch Cabinet



Parallel UPS units with Static Switch Cabinet and Static Switch Maintenance Cabinet



Parallel UPS Systems Set Up as a Frequency Converter



Floor Mounting

The UPS can be installed on a normal or raised floor, non-flammable, level and solid surface.

The dimensions are indicated in millimeters.

NOTICE
RISK OF OVERHEATING
The cabinet feet must not be removed.
Failure to follow these instructions can result in equipment damage.

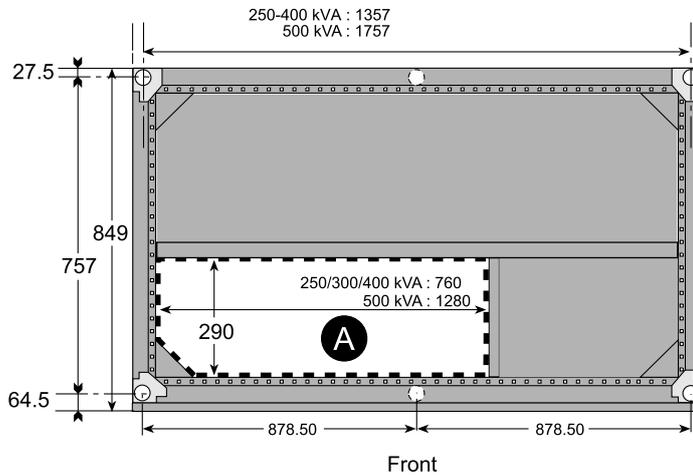
UPS Cabinets

NOTE: The four feet (six feet for 500 kVA UPS) of the cabinet are cylindrical, 45 mm in diameter. The measurements include the cabinet cover panels and the door.

Maximum load on floor per square cm per foot

UPS cabinet in kVA	Kg/cm ²
250	11
300	11
400	13
500	11

Top view



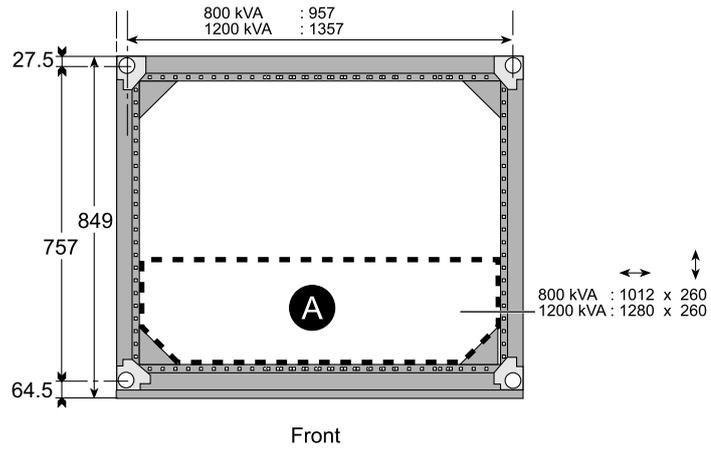
A. Cable-running zone

Static Switch Cabinets

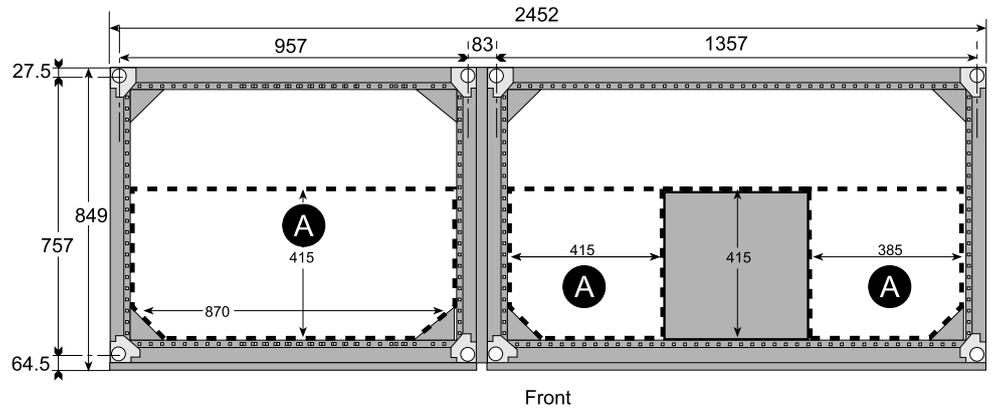
Maximum load on floor per square cm per foot

Static switch cabinet in kVA	Kg/cm ²
800	5
1200	9
2000	9
2000 light	7

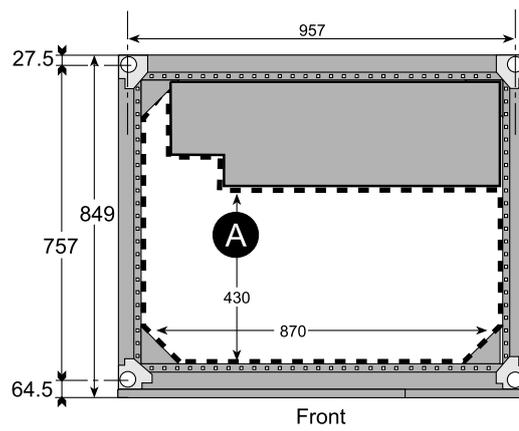
800 and 1200 kVA Top View



2000 kVA Top View



2000 kVA Light Top View

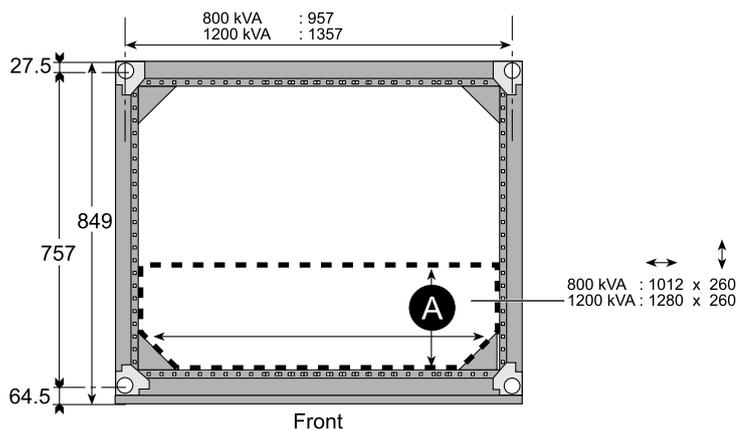


External Bypass or Static Switch Maintenance Cabinets

Maximum load on floor per square cm per foot

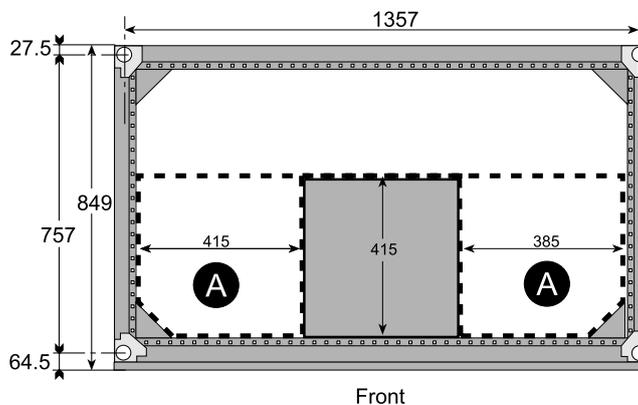
External bypass or static switch maintenance cabinet in kVA	Kg/cm ²
800	4
1200	5
2000	8

800 and 1200 kVA Top View



A. Cable-running zone

2000 kVA Top View



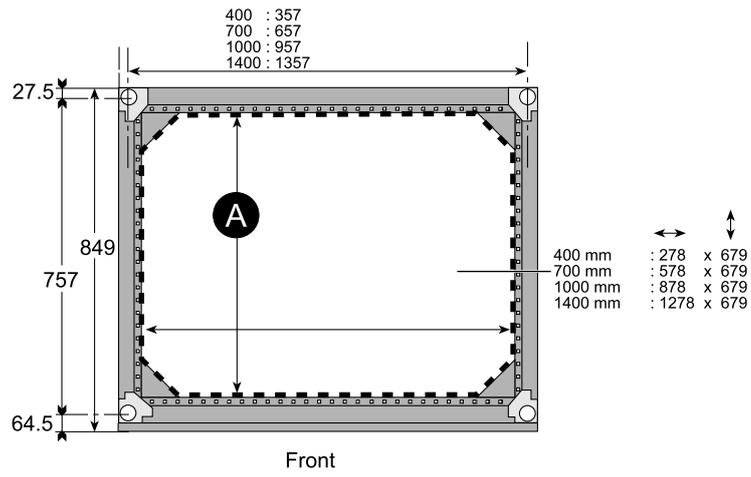
A. Cable-running zone

Auxiliary Cabinets (empty)

Maximum load on floor per square cm per foot

Auxiliary cabinet in millimeters	Kg/cm ²
400	0,9
700	1,2
1000	1,3
1400	1,8

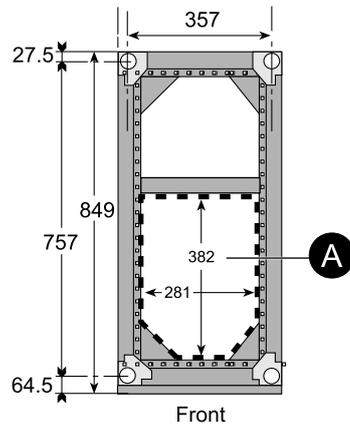
Top View



A. Cable-running zone

Backfeed Cabinet

Top View



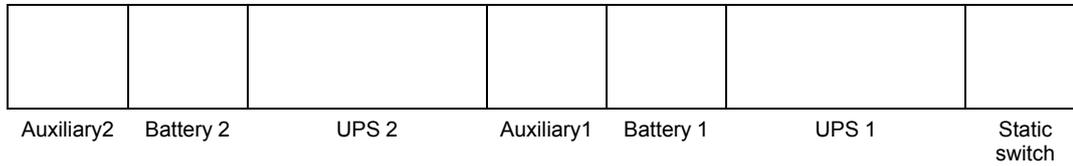
A. Cable-running zone

Prepare For Installation

Layouts

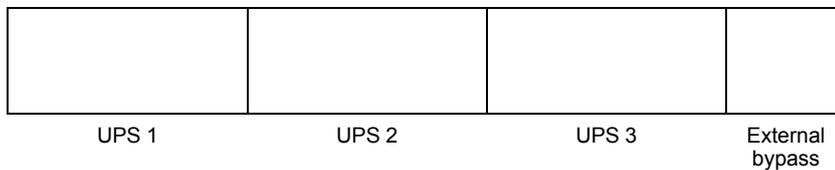
Typical Static Switch Cabinet Installation

Top View



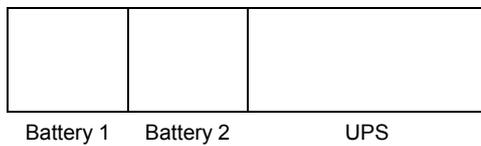
Typical External Bypass Cabinet Installation

Top View



Typical Battery or Auxiliary Cabinet Installation

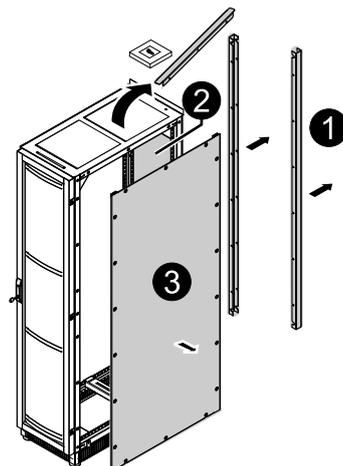
Top View



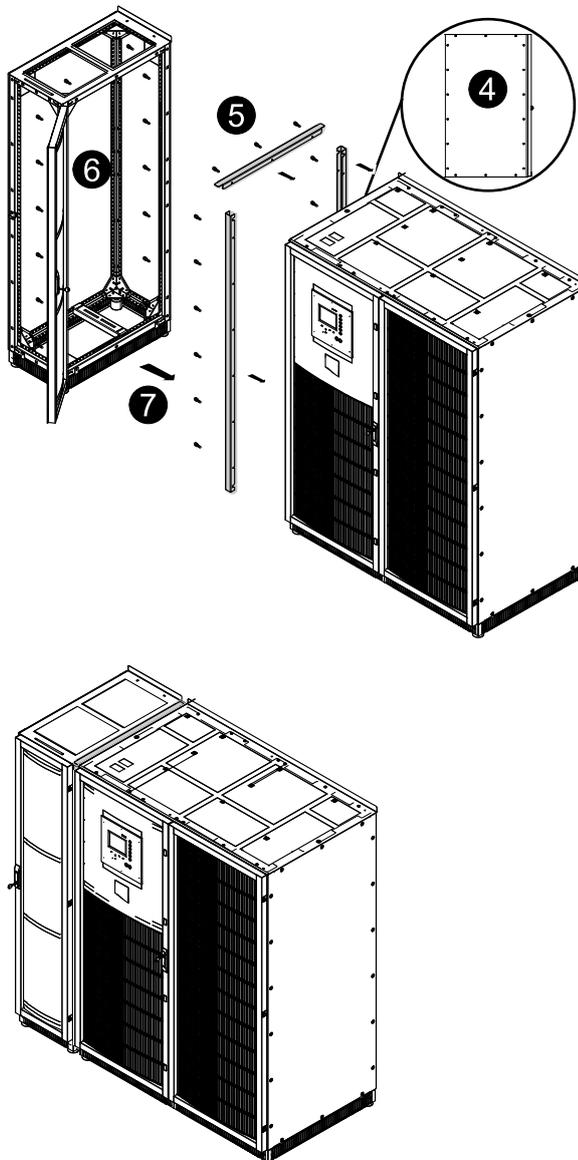
Mechanical Preparation

Install the 400 Millimeter Auxiliary Cabinet

1. Remove the two inter-cabinet uprights located behind the 400 mm cabinet.
2. Refit the rear panel on the 400 mm cabinet with the supplied screws.
3. Remove the side panel on the 400 mm cabinet.



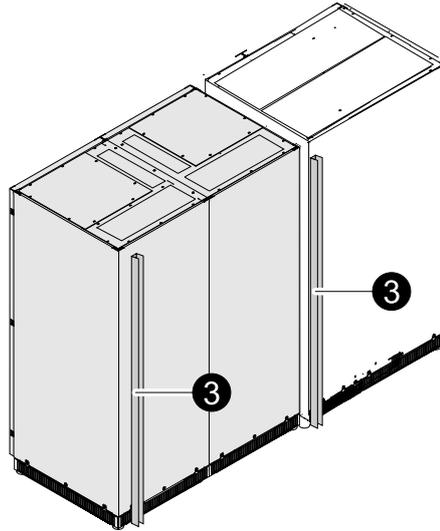
4. Unscrew the side panel of the cabinet to be coupled without removing it.
5. Place the three inter-cabinet uprights above the side panel of the cabinet to be coupled.
6. Place the screws on the 400 mm cabinet.
7. Couple the 400 mm cabinet with the cabinet to be coupled and tighten the screws from inside the 400 mm cabinet.



Install the 2000 kVA Static Switch Cabinet

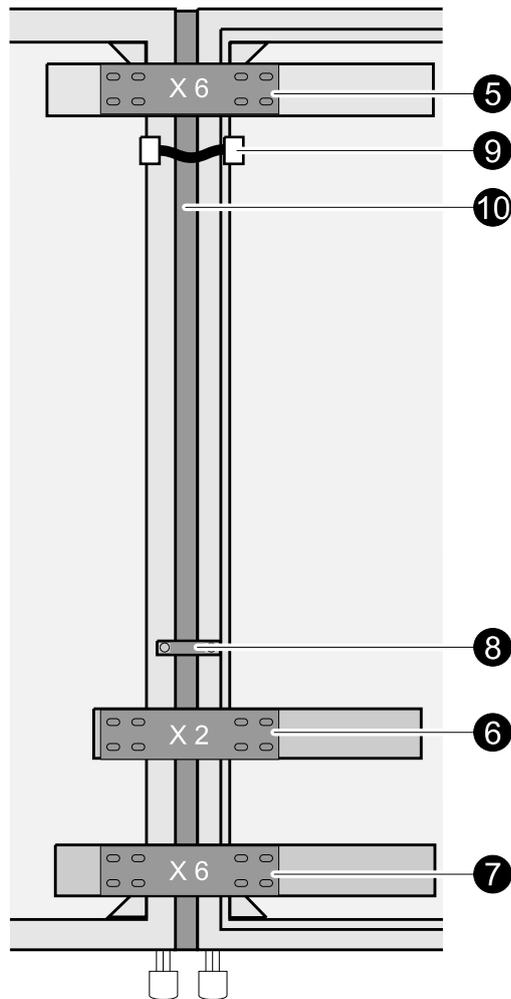
1. Place the cabinets in their final position.
2. Adjust the front feet to ensure the cabinets are vertical and the doors are aligned.

3. Remove the two inter-cabinet uprights located behind the right hand side cabinet.

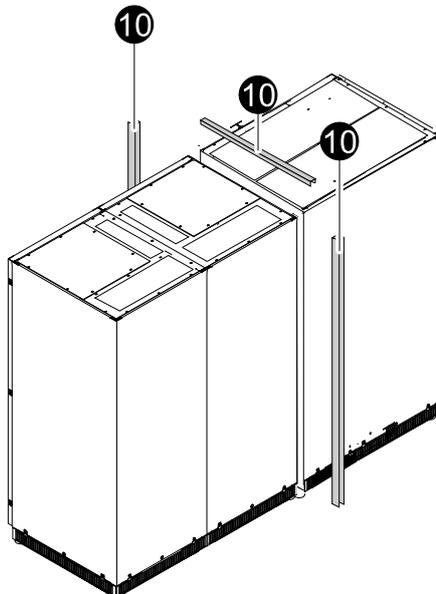


4. Align the fishplates horizontally.
5. Install the two upper-part fishplates L1, L2, L3 (six fishplates in total) between the two cabinets. Tightening torque is 75 Nm.
6. Install the two neutral fishplates between the two cabinets. Tightening torque is 75 Nm.
7. Install the two lower-part fishplates L1, L2, L3 (six fishplates in total) between the two cabinets. Tightening torque is 75 Nm.
8. Install the two earth braids between the front uprights of both cabinets.

9. Install the auxiliary wires between the connectors of both cabinets.



10. Install the three inter-cabinet uprights between the two cabinets.



Install the Anti-rodent Grid

NOTE: Only valid for UPS cabinets.

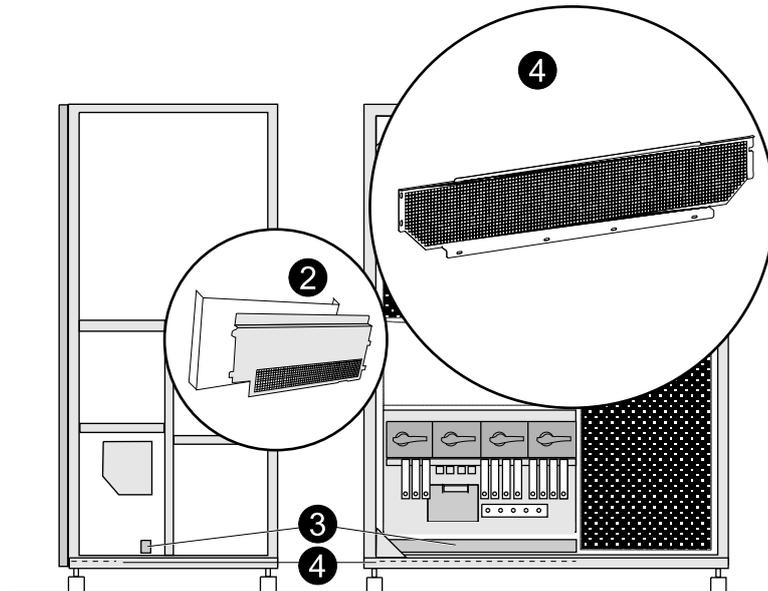
NOTE: This operation must be carried out before the power cables are connected.

⚠ CAUTION**RISK OF BURNS FROM HOT SURFACE**

All the cables for the same network (normal AC line, battery, bypass AC line, earth, load) must run through the same hole to avoid overheating of the anti-rodent grid.

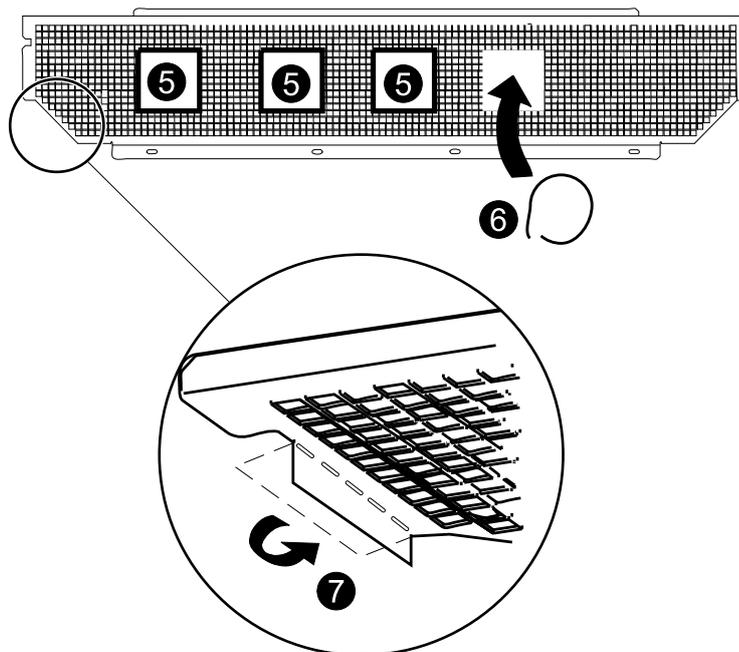
Failure to follow these instructions can result in injury or equipment damage.

1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.
3. Remove the tie bar.
4. Remove the anti-rodent grid.



5. Cut the anti-rodent grid to create holes for cables.
6. Install protection where the cables run through.
7. Fold the sheet downwards on the dotted lines.

8. Reinstall the anti-rodent grid.



9. Reinstall the tie bar.

10. Unfold the dust protection cover.

Adapt Cabinet for Neutral Point Connection

For the following upstream systems:

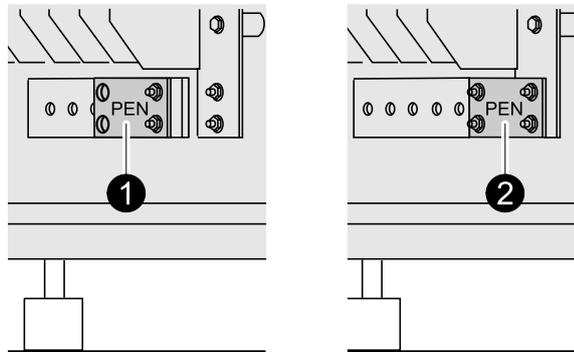
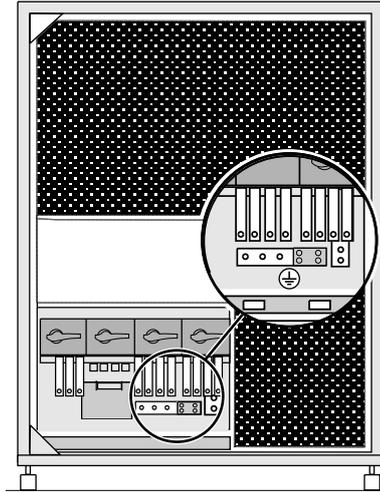
- IT
- TNS
- TT (PE)
- TNC (PEN)

For the following downstream systems:

- TNC
- TNS
- TT

1. Disconnect and remove the jumper on the earth bar.

- For TNC (PEN) upstream, TNC, TNS or TT downstream systems only: Install the jumper between the earth bar and the inverter neutral bar.



Connect the Power Cables

Connect the Power Cables in UPS Cabinets

Connect Power Cables in a 250 to 400 kVA Single or Integrated Parallel Cabinet

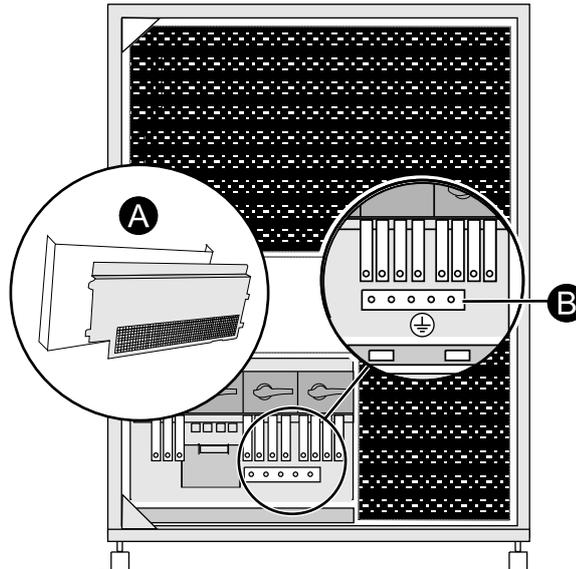
For parallel installations with no neutral on the load and the network, interconnect the UPS neutrals.

If an anti-rodent grid is required, see *Install the Anti-rodent Grid*, page 35.

NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

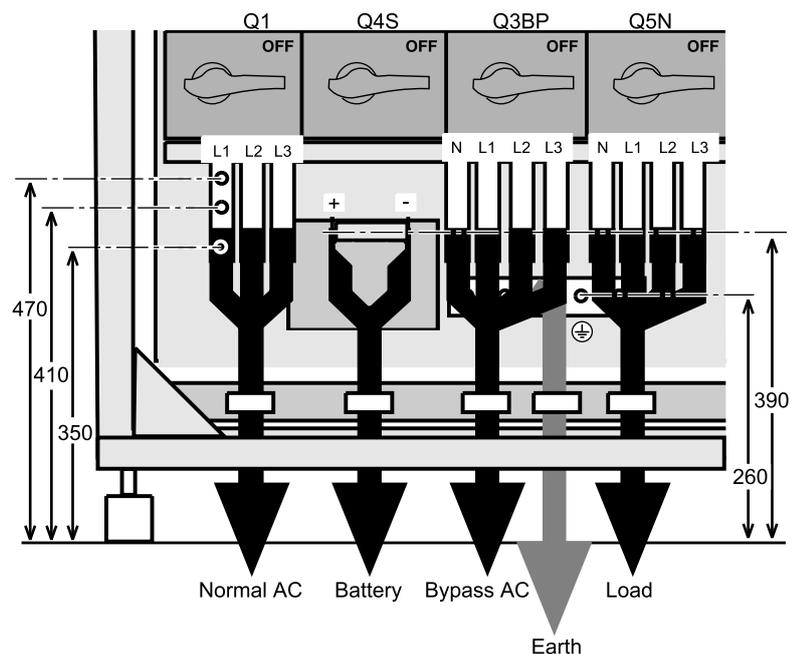
1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.

3. Check that switches Q1, Q4S, Q3BP, and Q5N are in the OFF position.



- A. Protective cover
- B. Earth bar

4. Connect the protective cable (PE or PEN) to the earth bar.
5. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
6. Connect the normal AC cables respecting the following order: L1, L2, L3.
7. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
8. Connect the load cables respecting the following order: N, L1, L2, L3.
9. Connect the battery.
10. Tie the cables down.
11. Connect the control cables, see *Connect the Control Cables*, page 60.
12. Reinstall the protective covers.
13. Unfold the dust protection cover.



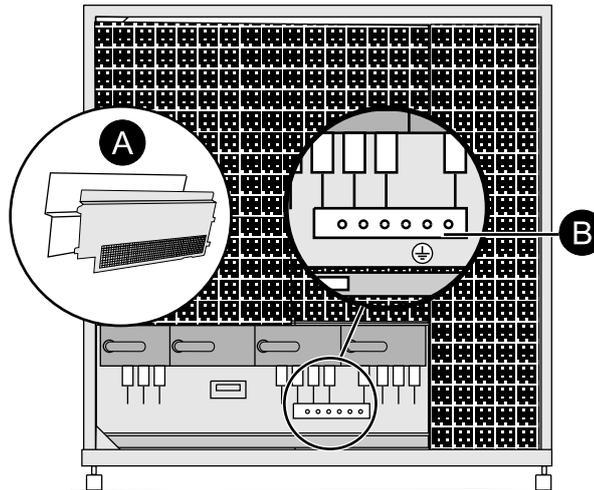
Connect Power Cables in a 500 kVA Single or Integrated Parallel Cabinet

For parallel installations with no neutral on the load and the network, interconnect the UPS neutrals.

If an anti-rodent grid is required, see *Install the Anti-rodent Grid, page 35*.

NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

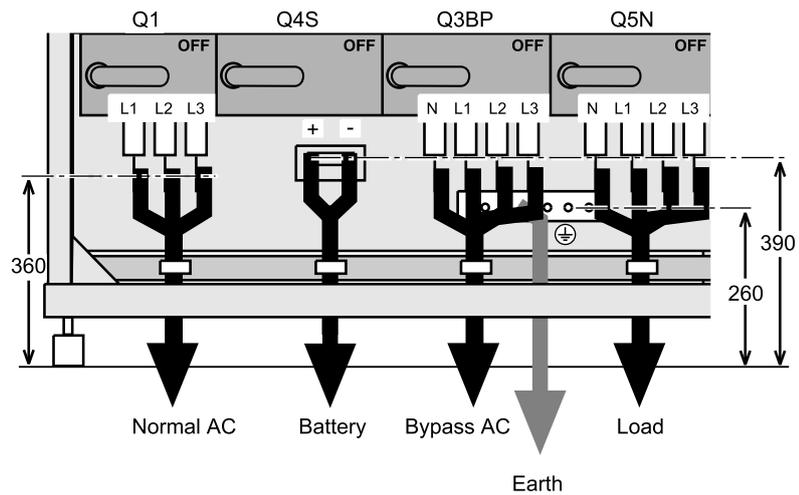
1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.
3. Check that switches Q1, Q4S, Q3BP, and Q5N are in the OFF position.



- A. Protective cover
- B. Earth bar

4. Connect the protective cable (PE or PEN) to the earth bar.
5. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection, page 37*.
6. Connect the normal AC cables respecting the following order: L1, L2, L3.
7. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
8. Connect the load cables respecting the following order: N, L1, L2, L3.
9. Connect the battery.
10. Tie the cables down.
11. Connect the control cables, see *Connect the Control Cables, page 60*.
12. Reinstall the protective covers.

13. Unfold the dust protection cover.



Connect Power Cables in a 250 to 400 kVA Frequency-converter Cabinet

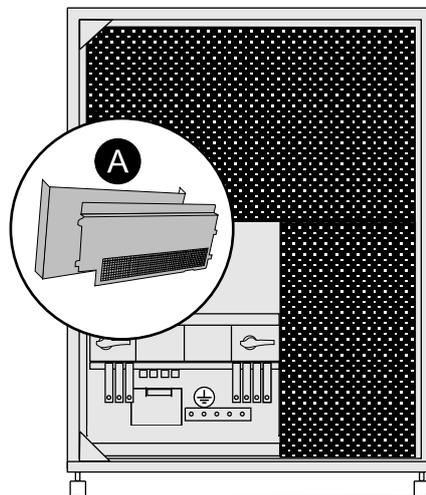
If several UPS units set up as frequency converters are in parallel, interconnect the neutrals between the cabinets. In this case, the minimum recommended cable size is the same as for the Normal AC line.

If an anti-rodent grid is required, see *Install the Anti-rodent Grid*, page 35.

NOTE: For UPSs used as frequency converters, Q4S and Q3BP switches are not present.

NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

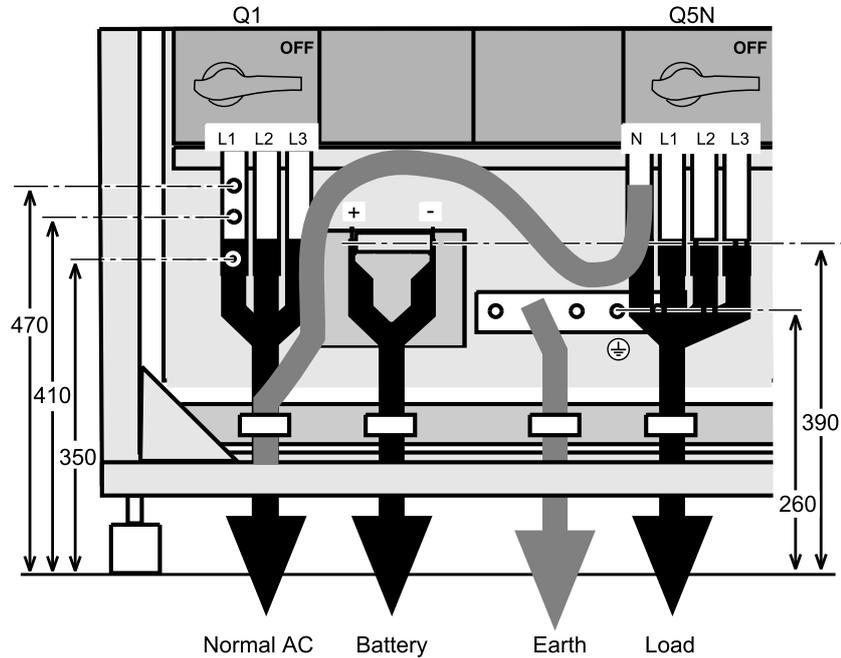
1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.
3. Check that the switches Q1 and Q5N are in the OFF position.



A. Protective cover

4. Connect the normal AC neutral to the load neutral.
5. Connect the protective cable (PE or PEN) to the earth bar.
6. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
7. Connect the normal AC cables respecting the following order: L1, L2, L3.
8. Connect the load cables respecting the following order: N, L1, L2, L3.
9. Connect the battery.

10. Tie the cables down.
11. Connect the control cables, see *Connect the Control Cables, page 60*.
12. Reinstall the protective covers.
13. Unfold the dust protection cover.



Connect Power Cables in a 500 kVA Frequency-converter Cabinet

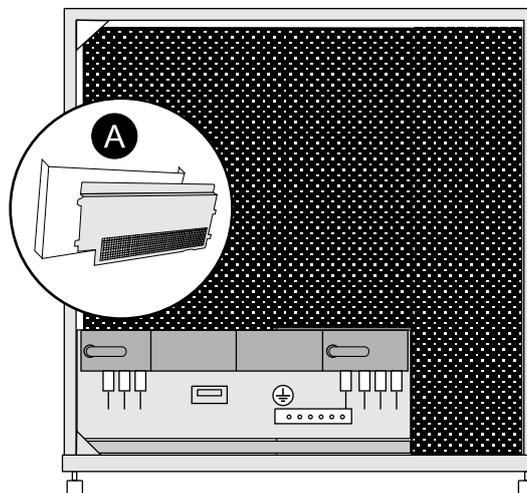
If several UPS units set up as frequency converters are in parallel, interconnect the neutrals between the cabinets. In this case, the minimum recommended size for the cables is the same as for the Normal AC line.

If an anti-rodent grid is required, see *Install the Anti-rodent Grid, page 35*.

NOTE: For UPSs used as frequency converters, Q4S and Q3BP switches are not present.

NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

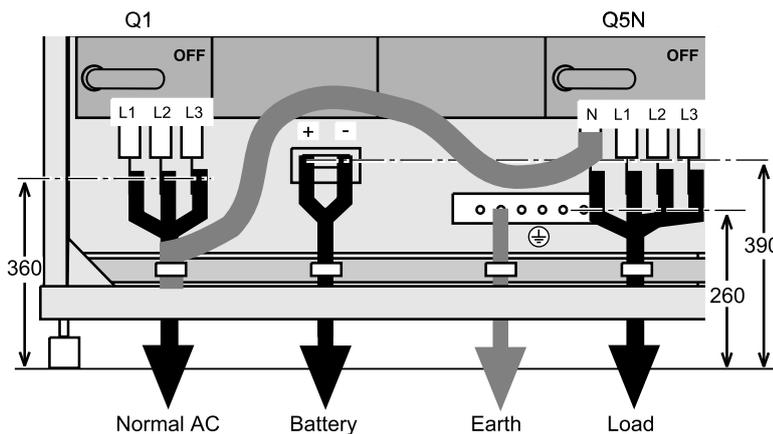
1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.
3. Check that the switches Q1 and Q5N are in the OFF position.



A. Protective cover

4. Connect the normal AC neutral to the load neutral.

5. Connect the protective cable (PE or PEN) to the earth bar.
6. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection, page 37*.
7. Connect the normal AC cables respecting the following order: L1, L2, L3.
8. Connect the load cables respecting the following order: N, L1, L2, L3.
9. Connect the battery.
10. Tie the cables down.
11. Connect the control cables, see *Connect the Control Cables, page 60*.
12. Reinstall the protective covers.
13. Unfold the dust protection cover.



Connect Power Cables in a 250 to 400 kVA Parallel Cabinet

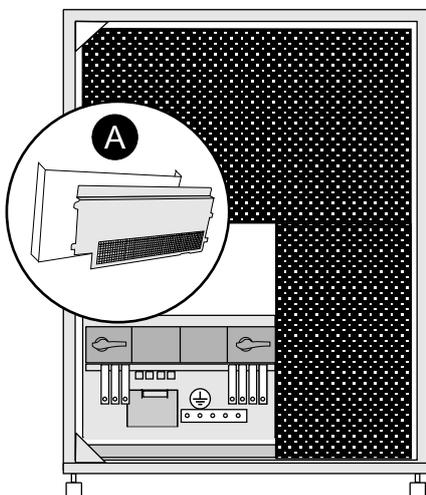
Interconnect the neutrals between the cabinets. The minimum recommended cable size is the same as the cables used for the Normal AC line.

If an anti-rodent grid is required, see *Install the Anti-rodent Grid, page 35*.

NOTE: In parallel UPS units with static switch cabinet, switches Q4S and Q3BP are absent. The bypass AC connection is made in the static switch cabinet.

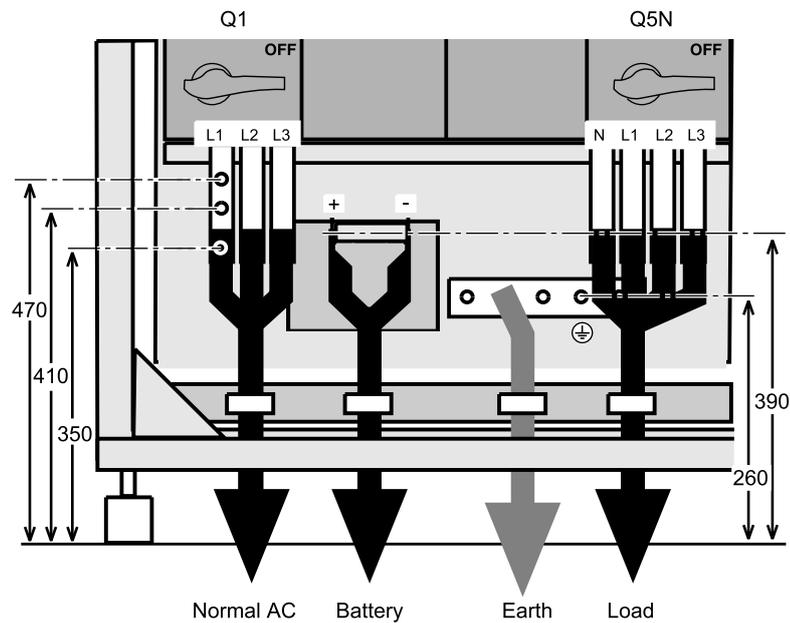
NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

1. Fold the dust protection cover as shown on the cover.
2. Remove the protective covers.



A. Protective cover

3. Check that the switches Q1 and Q5N are in the OFF position.
4. Connect the protective cable (PE or PEN) to the earth bar.
5. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
6. Connect the normal AC cables respecting the following order: L1, L2, L3.
7. Connect the load cables respecting the following order: N, L1, L2, L3.
8. Connect the battery.
9. Tie the cables down.
10. Connect the control cables, see *Connect the Control Cables*, page 60.
11. Reinstall the protective covers.
12. Unfold the dust protection cover.



Connect Power Cables in a 500 kVA Parallel Cabinet

Interconnect the neutrals between the cabinets. The minimum recommended cable size is the same as the cables used for the normal AC line.

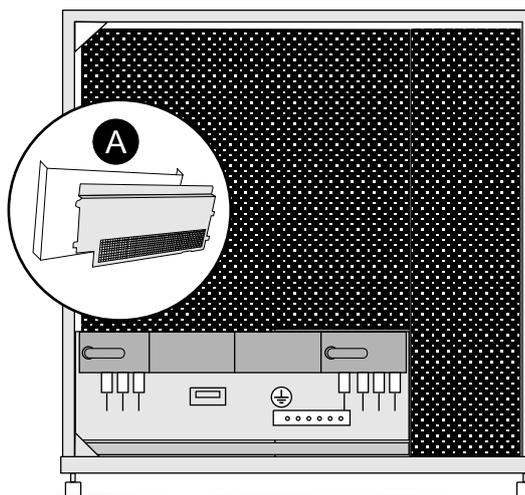
If an anti-rodent grid is required, see *Install the Anti-rodent Grid*, page 35.

NOTE: In parallel UPS units with static switch cabinet, switches Q4S and Q3BP are absent. The bypass AC connection is made in the static switch cabinet.

NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

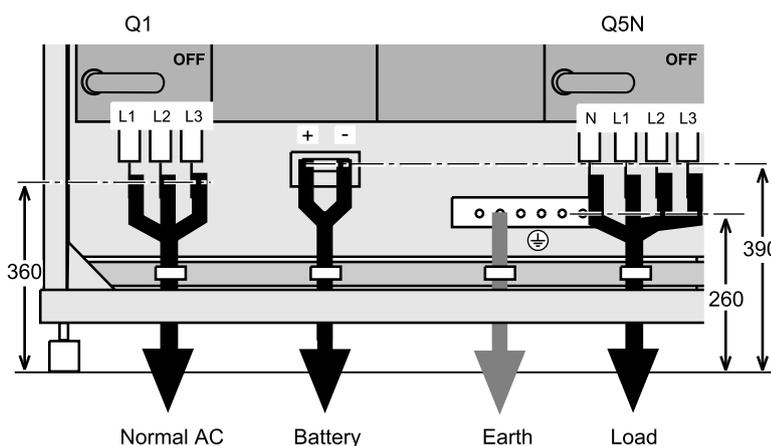
1. Fold the dust protection cover as shown on the cover.

- Remove the protective covers.



A. Protective cover

- Check that the switches Q1 and Q5N are in the OFF position.
- Connect the protective cable (PE or PEN) to the earth bar.
- Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
- Connect the normal AC cables respecting the following order: L1, L2, L3.
- Connect the load cables respecting the following order: N, L1, L2, L3.
- Connect the battery.
- Tie the cables down.
- Connect the control cables, see *Connect the Control Cables*, page 60.
- Reinstall the protective covers.
- Unfold the dust protection cover.

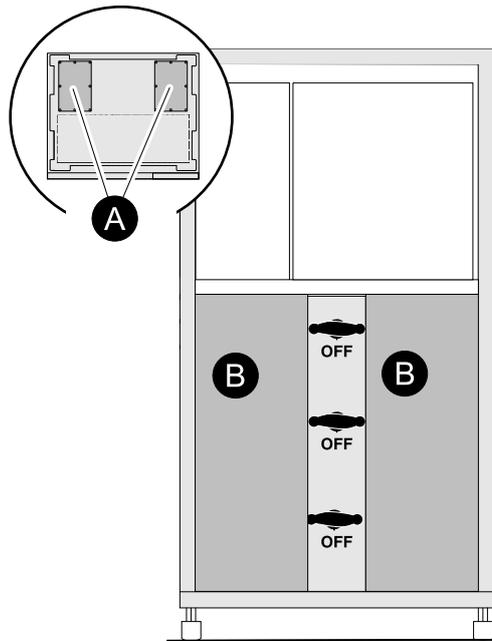


Connect the Power Cables in Static Switch Cabinets

Connect Power Cables in a 800 kVA Cabinet

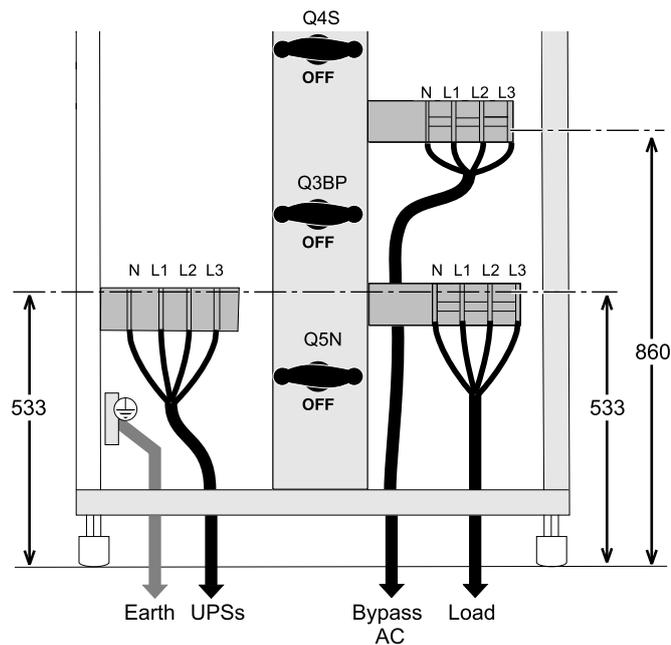
NOTE: Top cable entry is possible using an auxiliary cabinet 400 mm wide.

1. Remove the front and/or top protective covers.



- A. Top protective cover
- B. Front protective cover

2. Check that the switches Q4S, Q3BP, and Q5N are in the OFF position.
3. Connect the protective cable (PE or PEN) to the earth bar.
4. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
5. Connect the UPS⁹ cables in the following order: N, L1, L2, L3.
6. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
7. Connect the load cables respecting the following order: N, L1, L2, L3.
8. Connect the control cables, see *Connect the Control Cables*, page 60.
9. Reinstall the protective covers.

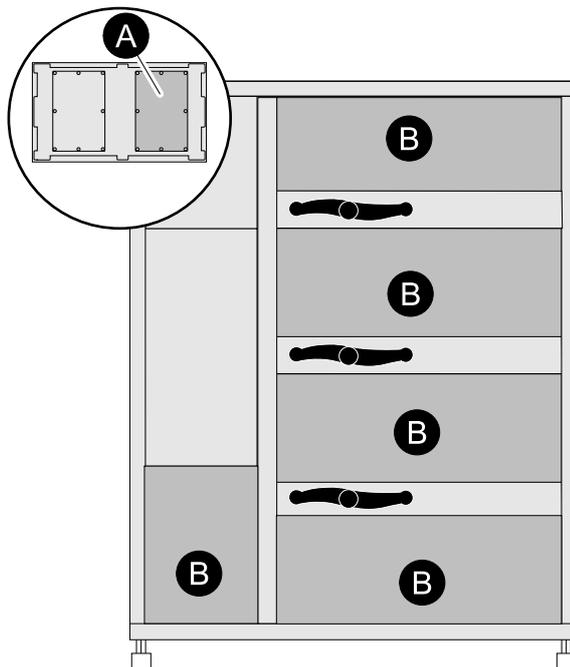


9. Or static switch maintenance cabinet, see *Connect Power Cables in a Static Switch Maintenance Cabinet*, page 55

Connect Power Cables in a 1200 kVA Cabinet

NOTE: Top and bottom cable entry are possible.

1. Remove the front and/or top protective covers.

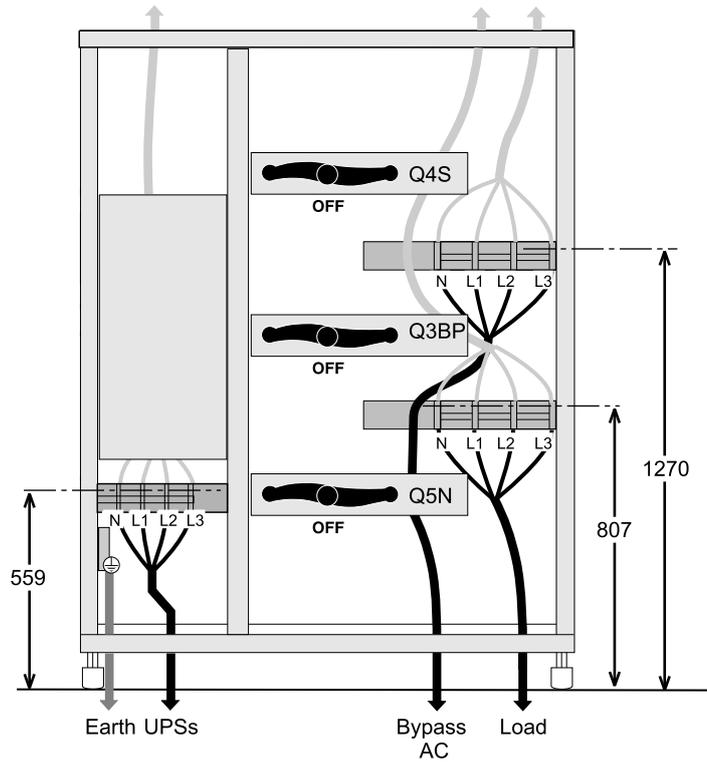


- A. Top protective cover
- B. Front protective cover

2. Check that the switches Q4S, Q3BP, and Q5N are in the OFF position.
3. Connect the protective cable (PE or PEN) to the earth bar.
4. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
5. Connect the UPS¹⁰ cables in the following order: N, L1, L2, L3.
6. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
7. Connect the load cables respecting the following order: N, L1, L2, L3.
8. Connect the control cables, see *Connect the Control Cables*, page 60.

10. Or static switch maintenance cabinet, see *Connect Power Cables in a Static Switch Maintenance Cabinet*, page 55

9. Reinstall the protective covers.

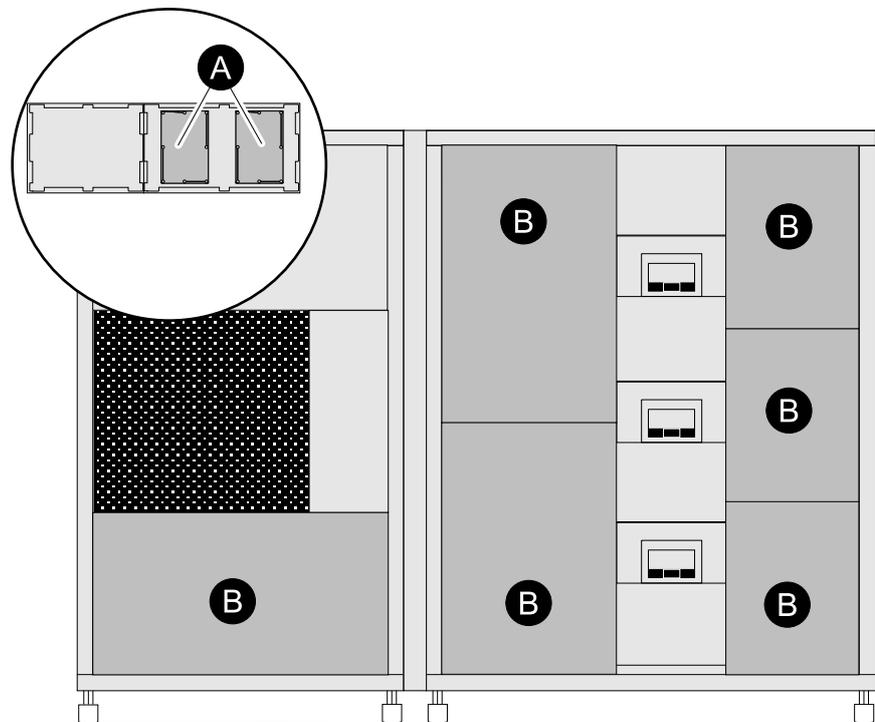


Connect Power Cables in a 2000 kVA Cabinet

Both cabinets must be assembled before connecting power cables, see *Install the 2000 kVA Static Switch Cabinet*, page 33.

NOTE: Top and bottom cable entry are possible.

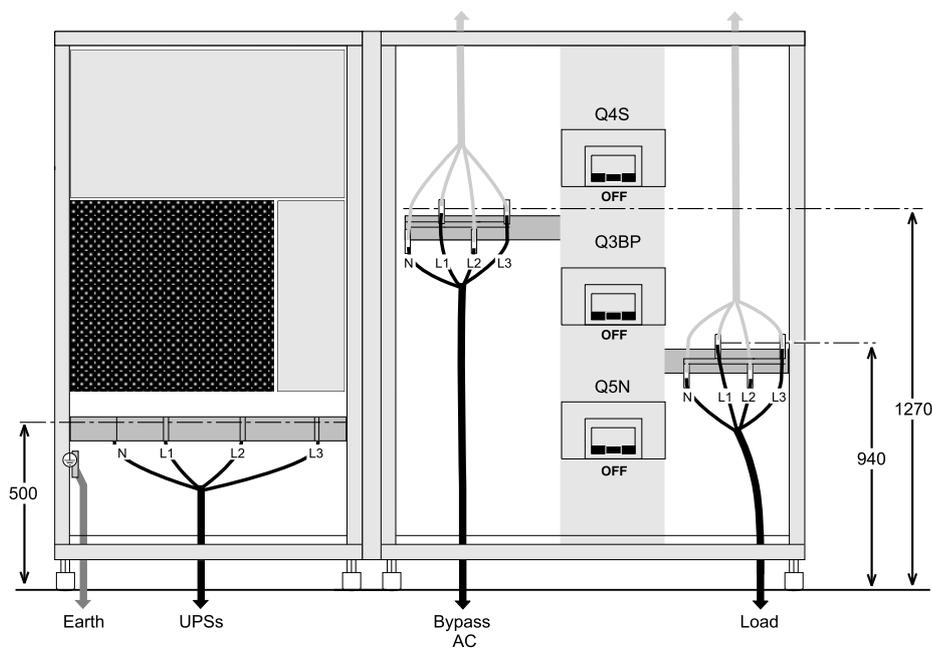
1. Remove the front and/or top protective covers.



- A. Top protective cover
- B. Front protective cover

2. Check that the switches Q4S, Q3BP, and Q5N are in the OFF position.

3. Connect the protective cable (PE or PEN) to the earth bar.
4. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
5. Connect the UPS¹¹ cables in the following order: N, L1, L2, L3.
6. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
7. Connect the load cables respecting the following order: N, L1, L2, L3.
8. Connect the control cables, see *Connect the Control Cables*, page 60.
9. Reinstall the protective covers.

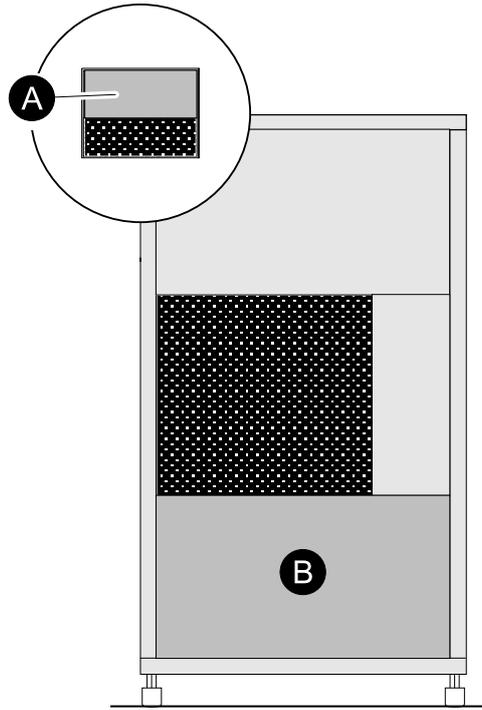


Connect Power Cables in a 2000 kVA Light Cabinet

The cabinet must be connected to the bypass AC line **exclusively** through the top using the busway. Please contact Schneider Electric for more information.

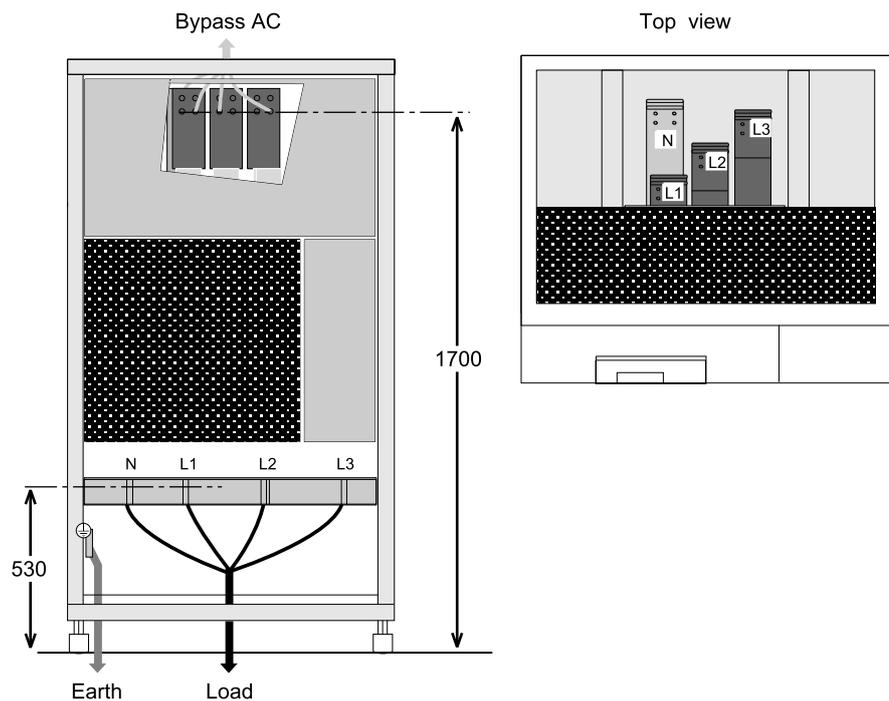
11. Or static switch maintenance cabinet, see *Connect Power Cables in a Static Switch Maintenance Cabinet*, page 55

1. Remove the front and top protective covers.



- A. Top protective cover
- B. Front protective cover

2. Check that the switches Q4S, Q3BP, and Q5N are in the OFF position.
3. Connect the protective cable (PE or PEN) to the earth bar.
4. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
5. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
6. Connect the load cables respecting the following order: N, L1, L2, L3.
7. Connect the control cables, see *Connect the Control Cables*, page 60.
8. Reinstall the protective covers.

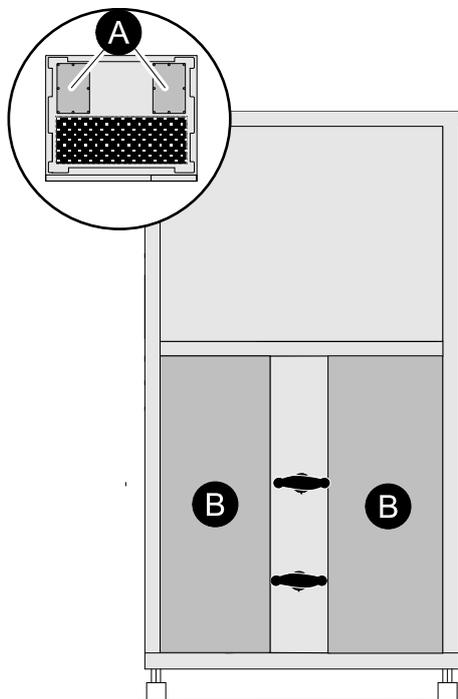


Connect the Power Cables in External Bypass Cabinets

Connect Power Cables in a 800 kVA Cabinet

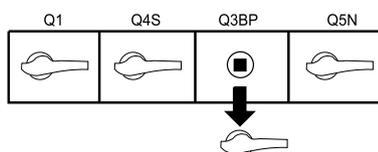
NOTE: Top and bottom cable entry are possible.

1. Remove the front and/or top protective covers.



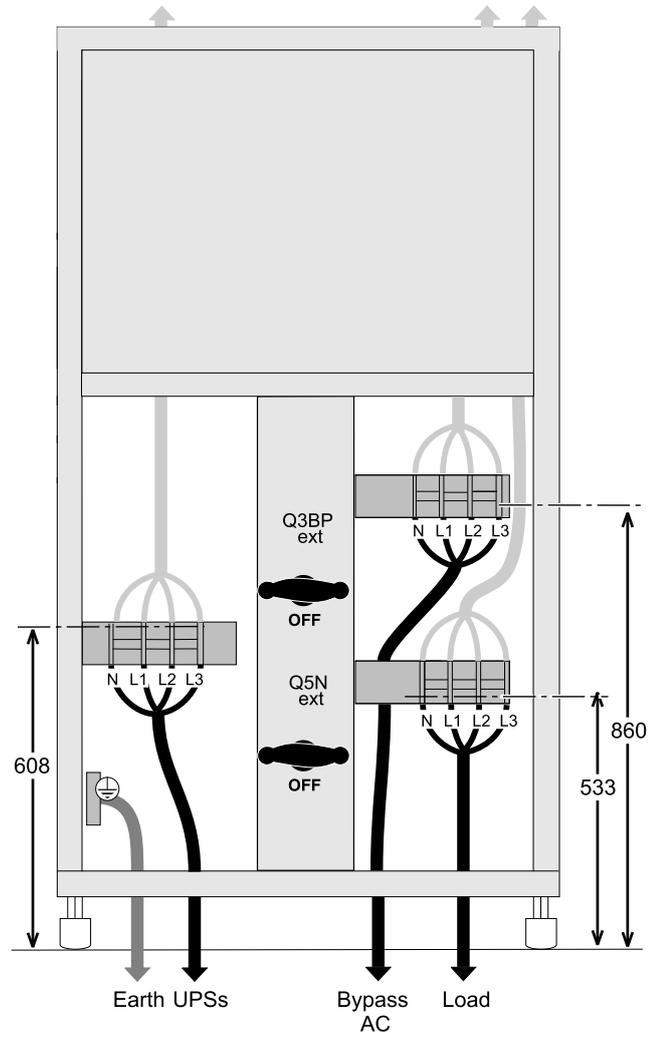
- A. Top protective cover
- B. Front protective cover

2. Check that the Q3BP switches are in the OFF position on all UPS units.
3. Remove the Q3BP switch handles on all UPS units.



4. Check that the switches Q3BP ext, and Q5N ext are in the OFF position.
5. Connect the protective cable (PE or PEN) to the earth bar.
6. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
7. Connect the UPS cables in the following order: N, L1, L2, L3.
8. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
9. Connect the load cables respecting the following order: N, L1, L2, L3.

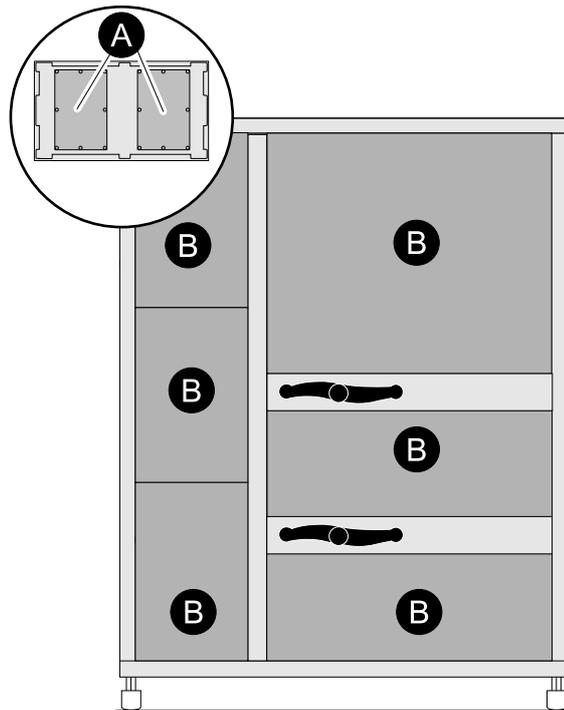
10. Reinstall the protective covers.



Connect Power Cables in a 1200 kVA Cabinet

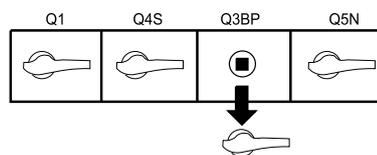
NOTE: Top and bottom cable entry are possible.

1. Remove the front and/or top protective covers.



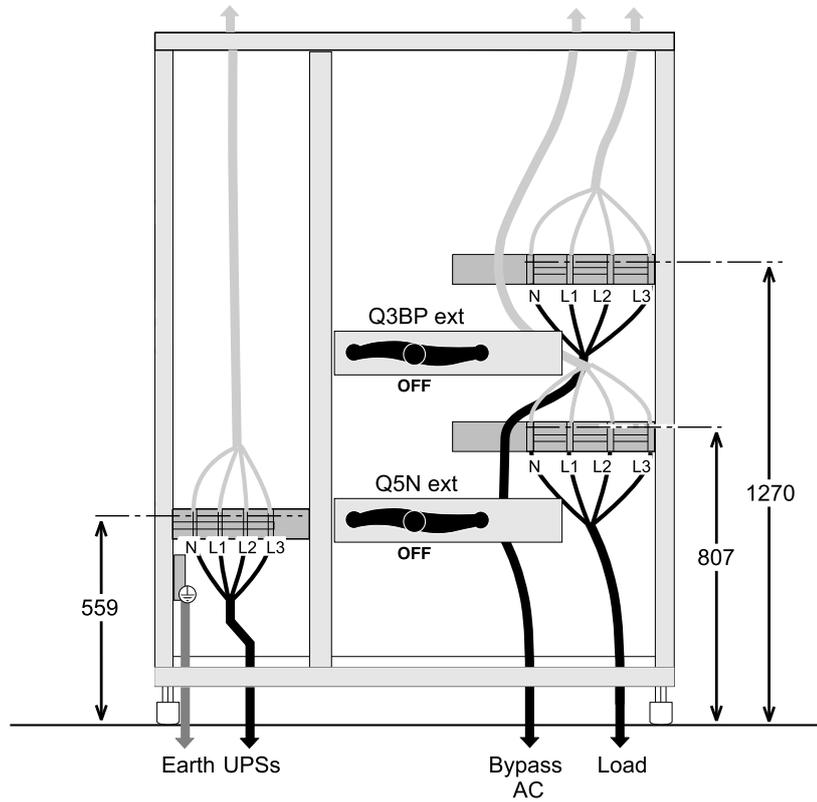
- A. Top protective cover
- B. Front protective cover

2. Check that the Q3BP switches are in the OFF position on all UPS units.
3. Remove the Q3BP switch handles on all UPS units.



4. Check that the switches Q3BP ext and Q5N ext are in the OFF position.
5. Connect the protective cable (PE or PEN) to the earth bar.
6. Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
7. Connect the UPS cables in the following order: N, L1, L2, L3.
8. Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
9. Connect the load cables respecting the following order: N, L1, L2, L3.

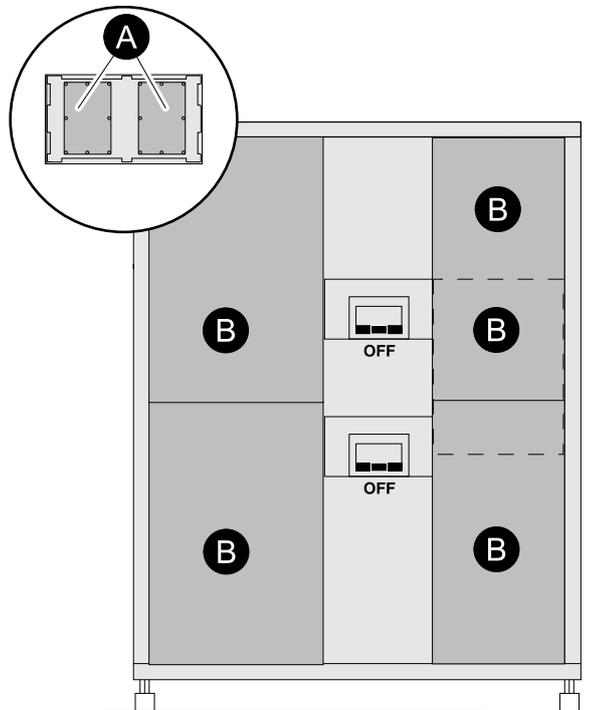
10. Reinstall the protective covers.



Connect Power Cables in a 2000 kVA Cabinet

NOTE: Top and bottom cable entry are possible.

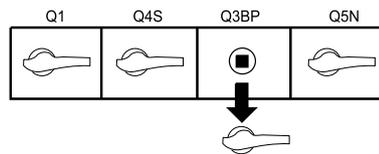
1. Remove the front and/or top protective covers.



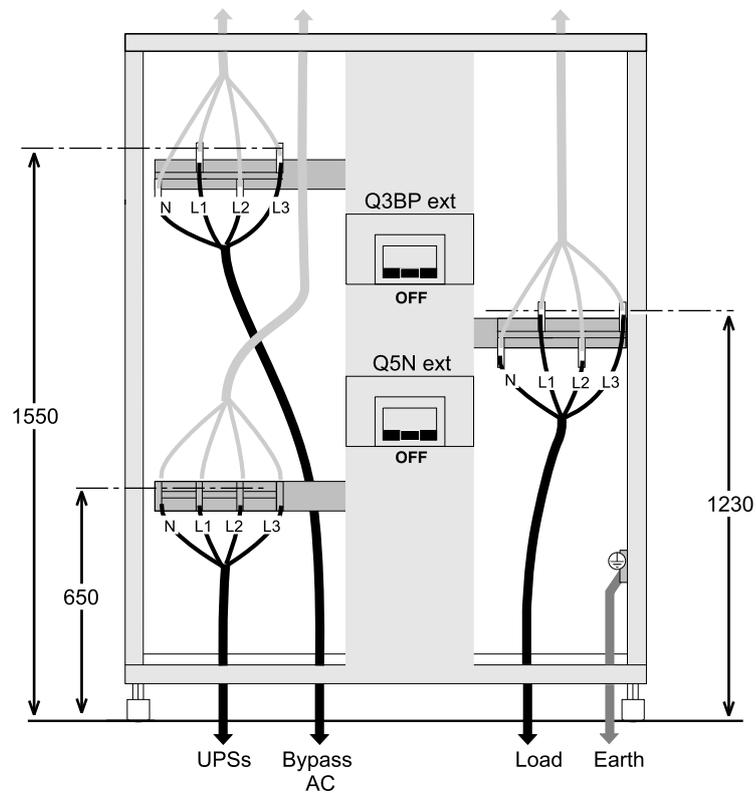
- A. Top protective cover
- B. Front protective cover

2. Check that the Q3BP switches are in the OFF position on all UPS units.

- Remove the Q3BP switch handles on all UPS units.



- Check that the switches Q3BP ext and Q5N ext are in the OFF position.
- Check if the cabinet needs neutral adaptation, see *Adapt Cabinet for Neutral Point Connection*, page 37.
- Connect the protective cable (PE or PEN) to the earth bar.
- Connect the UPS cables in the following order: N, L1, L2, L3.
- Connect the bypass AC cables respecting the following order: N, L1, L2, L3.
- Connect the load cables respecting the following order: N, L1, L2, L3.
- Reinstall the protective covers.

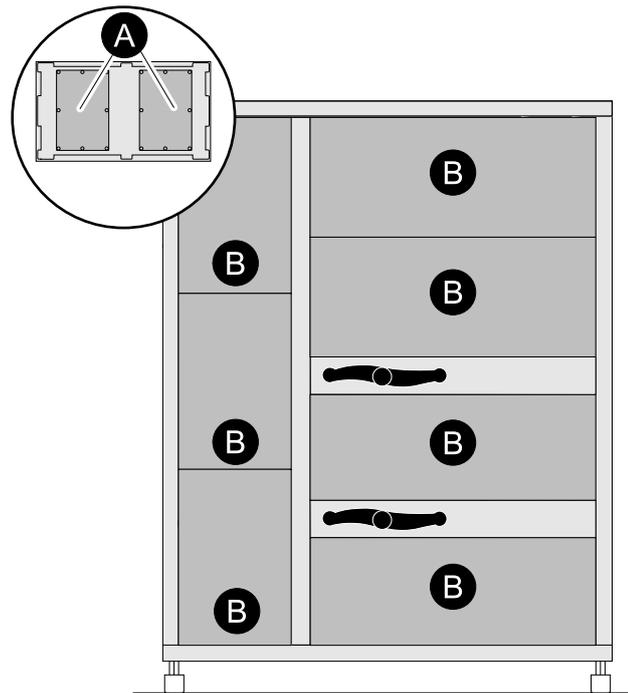


Connect Power Cables in a Static Switch Maintenance Cabinet

NOTE: Top and bottom cable entry are possible.

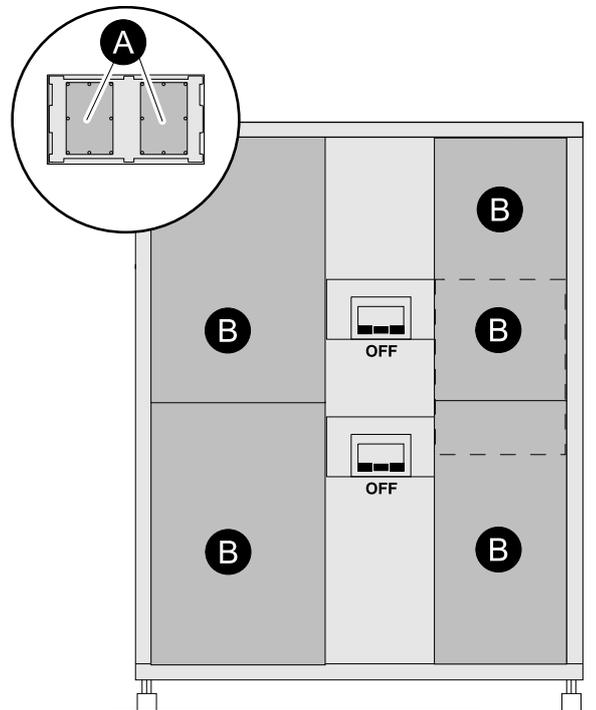
1. Remove the front protective and/or top covers.

800 or 1200 kVA Cabinet



- A. Top protective cover
- B. Front protective cover

2000 kVA Cabinet

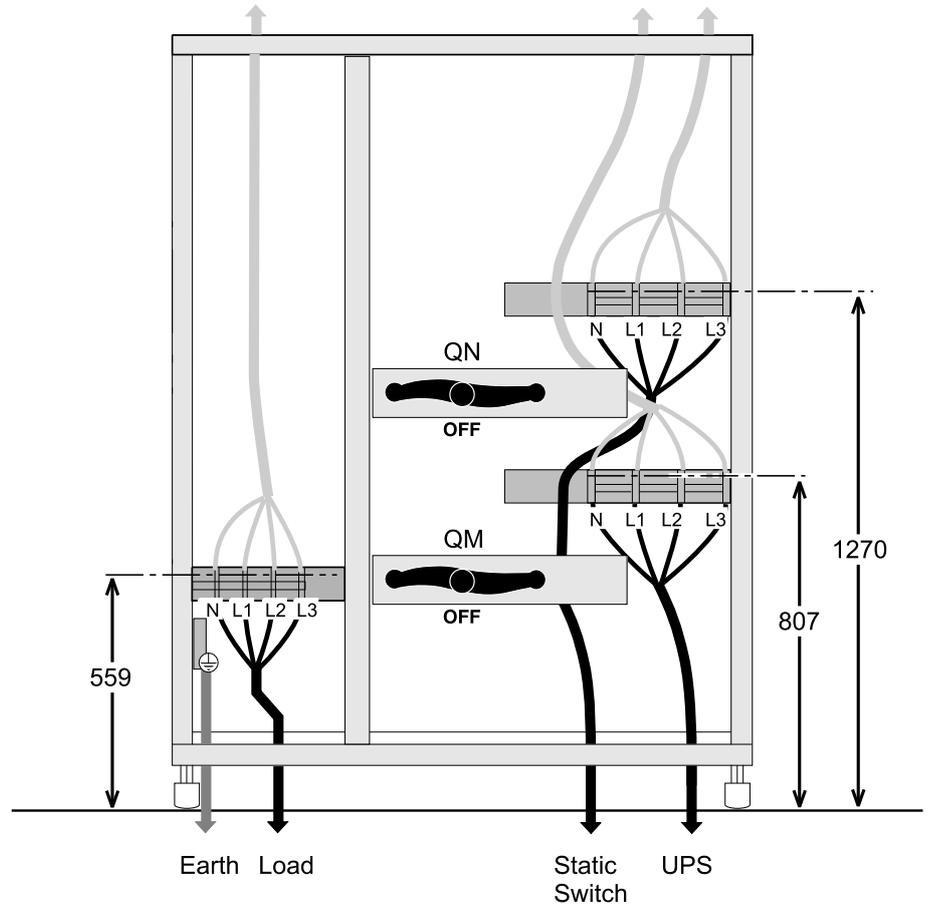


- A. Top protective cover
- B. Front protective cover

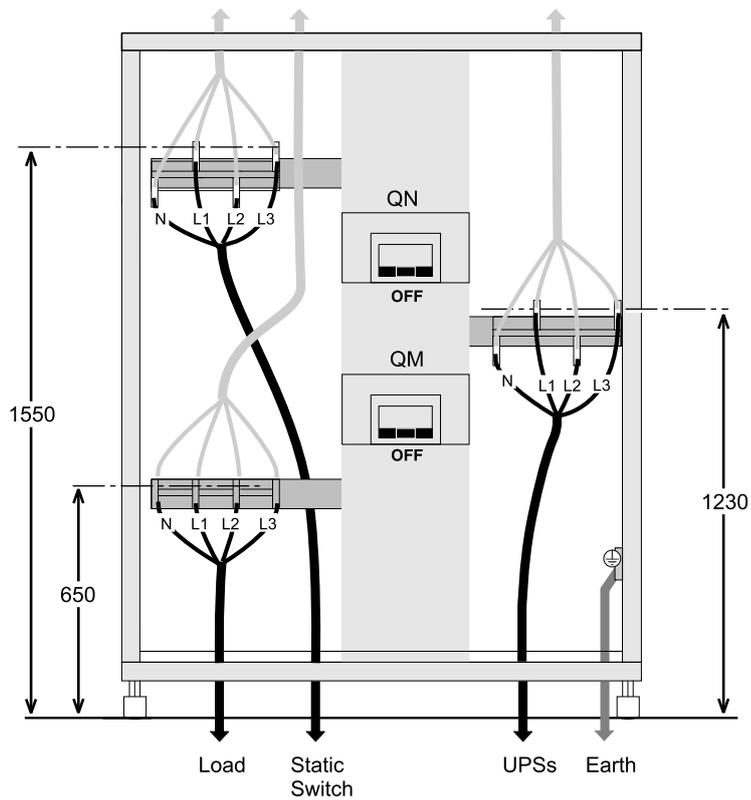
2. Check that the switches QN and QM are in the OFF position.
3. Connect the protective cable (PE or PEN) to the earth bar.
4. Connect the UPS cables respecting the following order: N, L1, L2, L3.
5. Connect the AC bypass cables respecting the following order: N, L1, L2, L3.

- 6. Connect the load cables respecting the following order: N, L1, L2, L3.
- 7. Reinstall the protective covers.

800 or 1200 kVA Cabinet



2000 kVA Cabinet



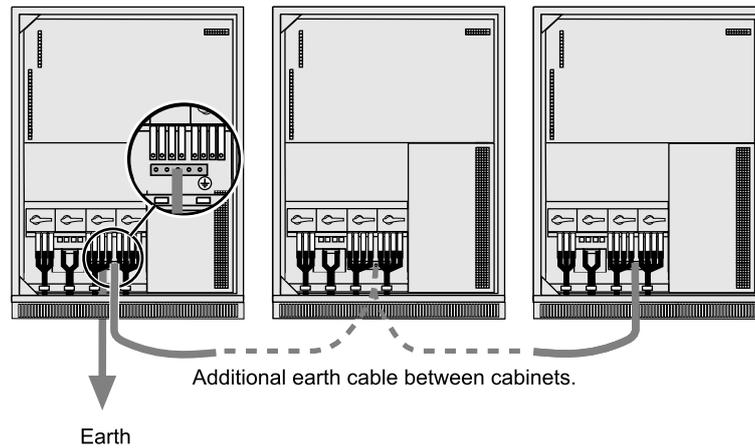
Connect Cabinets to Earth

This operation must be performed for all UPS, external bypass, static switch, and battery cabinets.

Additional cables are not supplied. Characteristics for the cable are:

- Minimum size of the earthing cable is half the size of a phase cable
- Cable type is the same as for phase cables
- Cables must be as short as possible

1. Connect all the earth bars of the cabinets together.



Connect the Backfeed Protection

Danger labels, as shown below, are required in the installation in a language which is acceptable in the country in which the UPS system is installed. The labels are supplied by the user. Refer to the drawings to know where they must be located.

⚠ DANGER

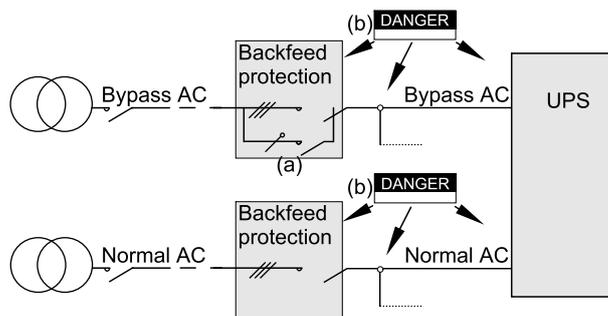
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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.

UPS's External Backfeed Protection (Option)

A backfeed protection is required for each supply line.



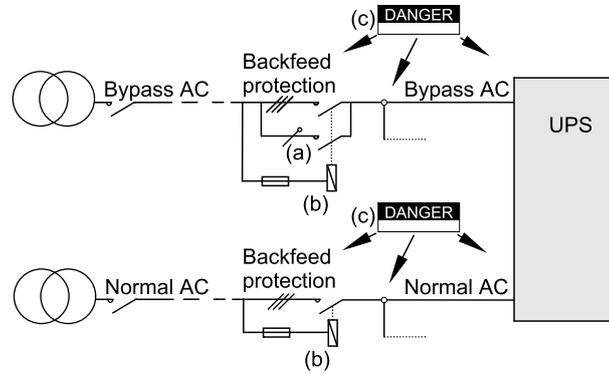
(a) In IT earthing systems with neutral, a four pole backfeed protection device is required.

(b) Labels as specified above must be added close to the terminals as described on the drawing.

Backfeed Protection Integrated in the Installation

The backfeed protection device can be part of the installation.

Components for this solution are not provided. Contact Schneider Electric for support.



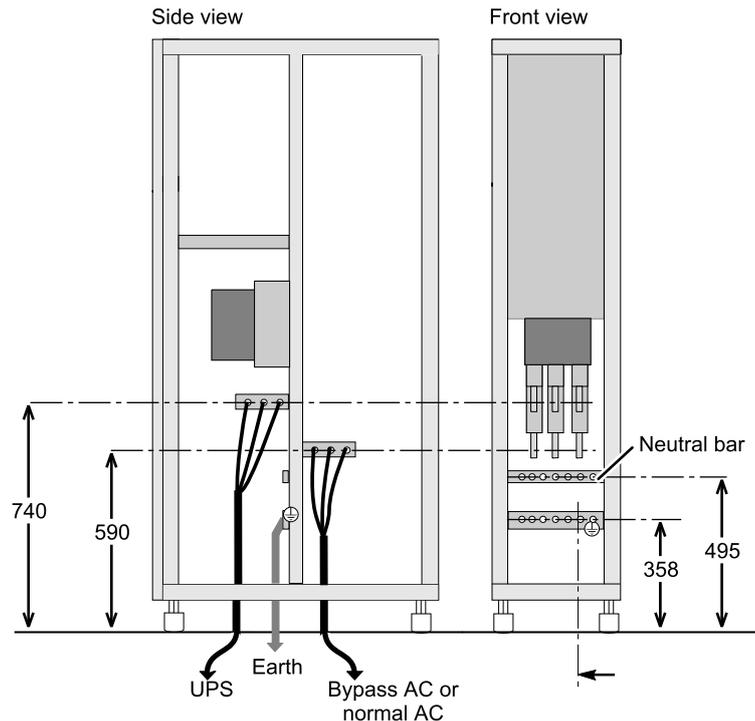
(a) In IT earthing systems with neutral, a four pole backfeed protection device is required.

(b) The backfeed protection device must open within less than fifteen seconds after the upstream supply voltage disappears. Such device must be rated according to the UPS specification and protected as required. A switching device equipped with the appropriate coil is an example of backfeed protection device.

(c) Labels as specified above must be added close to the terminals as described on the drawing.

Connect the UPS's External Backfeed Protection (Option)

1. Remove the front protective cover.
2. Connect the protective cable (PE or PEN) to the earth bar.
3. For bypass AC cabinet only: connect the neutral cable to the neutral bar.
4. For bypass AC cabinet only: connect the bypass AC cables in the following order: L1, L2, L3.
5. For normal AC cabinet only: connect the normal AC cables in the following order: L1, L2, L3.
6. Connect the UPS cables in the following order: L1, L2, L3.
7. Reinstall the protective cover.

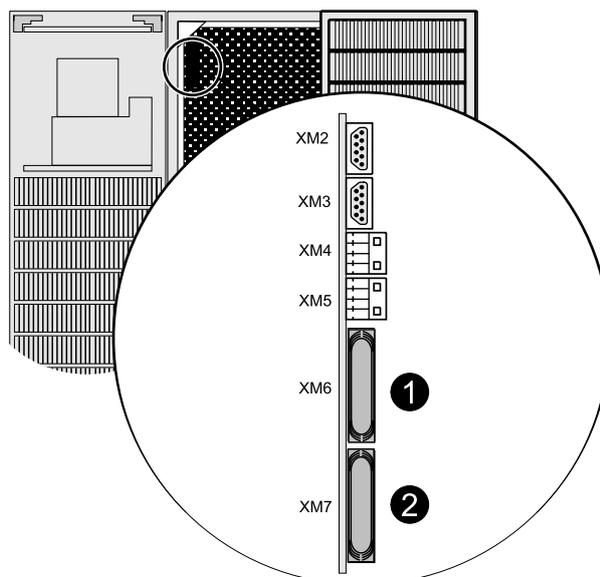


Connect the Control Cables

Set the Single Integrated Parallel or Single Frequency Converter Cabinet.

1. Plug a blue terminator on connector XM6 in the UPS.

2. Plug a red terminator on connector XM7 in the UPS.



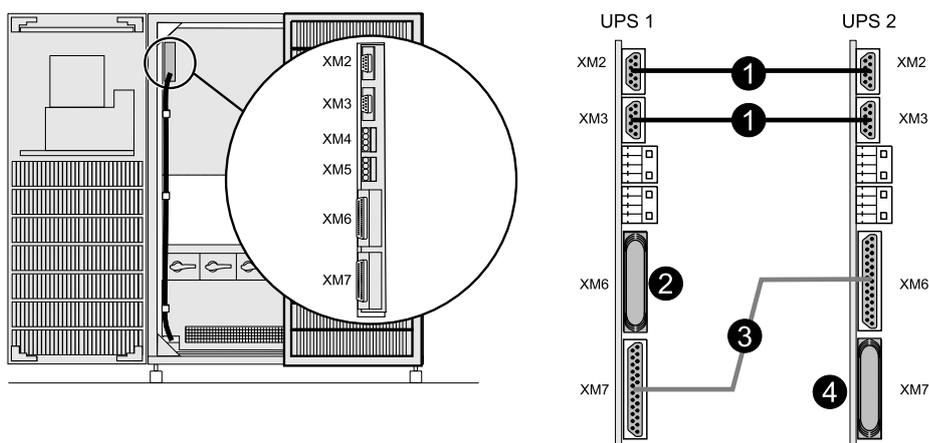
Connect Control Cables in Parallel UPS Cabinet

The supplied cables are 10 m or 20 m long.

The total length must not exceed 180 m.

1. Connect the XM2 and XM3 connectors in the two UPS units.
2. Plug a blue terminator on connector XM6 in UPS 1.
3. Connect XM7 in UPS 1 to XM6 in UPS 2.
4. Plug a red terminator on connector XM7 in the UPS 2.
5. Path the cables behind protective covers, as shown in the UPS cabinet.
6. Run the cables with the earth cables outside the cabinet.

Example for two UPSs



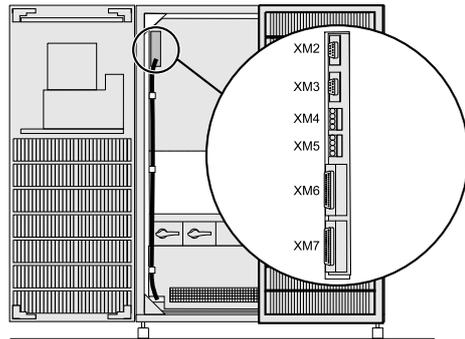
Connect Control Cables in Integrated Parallel UPS Cabinet with the External Bypass Cabinet

The supplied cables are 10 m or 20 m long. Please contact Schneider Electric for more information.

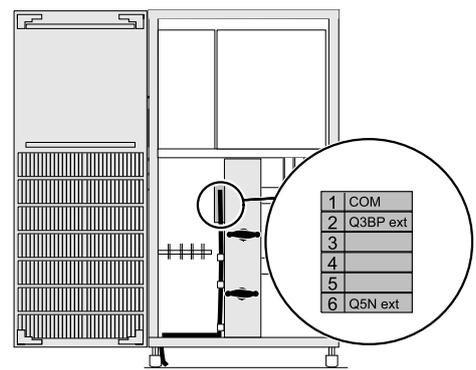
The characteristics of the non-supplied control cables (connected to XM4 and XM5) are 0.5 to 1.5 mm² / AWG20 to AWG16.

The total cable length must not exceed 180 m.

UPS Cabinet

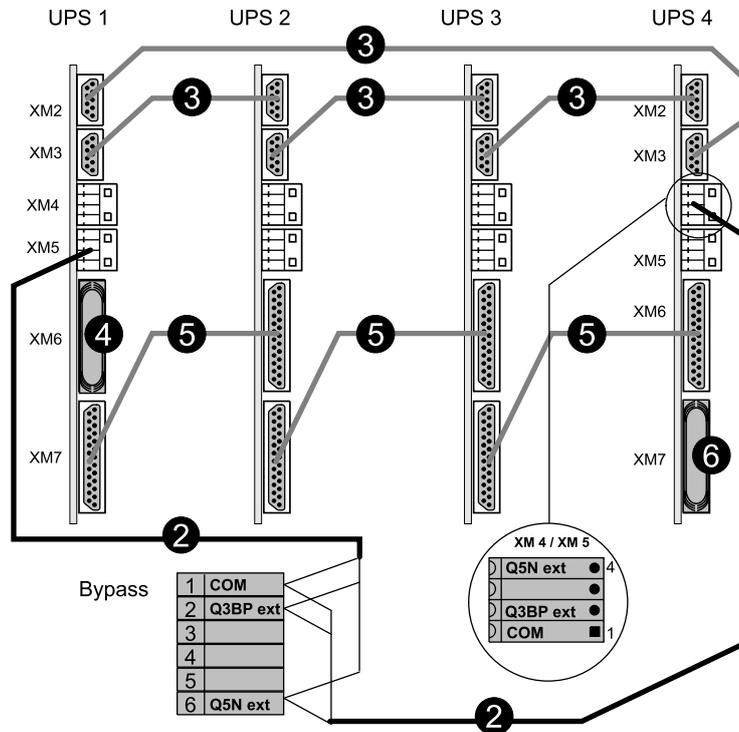


Bypass Cabinet



1. Check that all Q3BP handles are removed from all UPS units.
2. Connect the common Q3BP ext and Q5N ext terminals on the terminal block in the external bypass cabinet to connector XM4 in UPS 4 and XM5 in UPS 1 (cables not supplied).
3. Create a loop between XM2 and XM3 connectors in the four UPS units.

NOTE: All the connectors must be used.
4. Plug a blue terminator on connector XM6 in UPS 1.
5. Interconnect the XM6 and XM7 connectors in the four UPS units.
6. Plug a red terminator on connector XM7 in the UPS 4.
7. Path the cables behind protective covers, as shown in the UPS cabinet. Control cables and power cables must run apart.
8. Run the cables with the earth cables outside the cabinet.

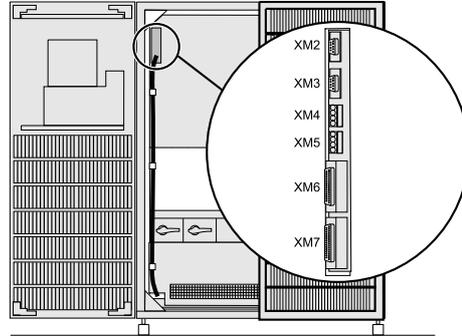


Connect Control Cables in Parallel UPS Cabinet with the Static Switch Cabinet

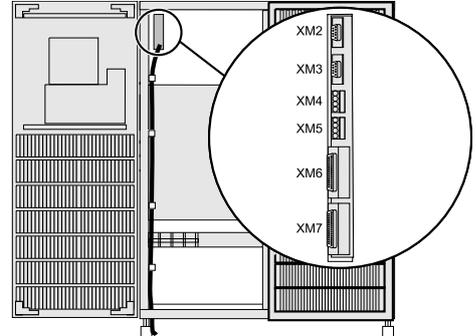
The supplied cables are 10 m or 20 m long. Please contact Schneider Electric for more information.

The total cable length must not exceed 180 m.

UPS Cabinet



Static Switch Cabinet



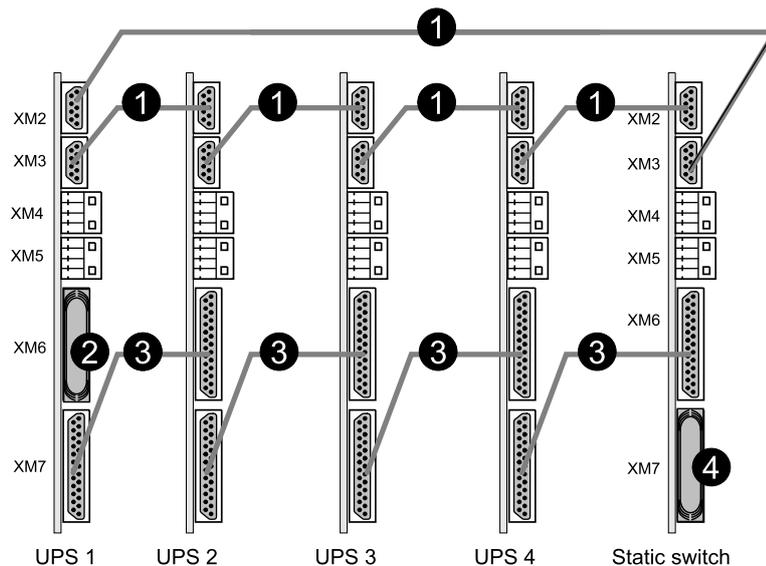
1. Create a loop between XM2 and XM3 connectors in the four UPS units and the static switch cabinet.

NOTE: All the connectors must be used.

2. Plug a blue terminator on connector XM6 in UPS 1.
3. Interconnect the XM6 and XM7 connectors in the four UPS cabinets and the static switch cabinet.
4. Plug a red terminator on connector XM7 in the static switch cabinet.

NOTE: Connectors XM4 and XM5 in the static switch cabinet are not used.

5. Path the cables behind protective covers, as shown in the UPS cabinet. Control cables and power cables must run apart.
6. Run the cables with the earth cables outside the cabinet.



Connect Control Cables in 2000 kVA Light Static Switch Cabinet

The characteristics of the non-supplied control cables are:

- For current sensor connection: twisted pairs of 0.8 to 1 mm² AWG18 gauge wire with a maximum length of 100 m.

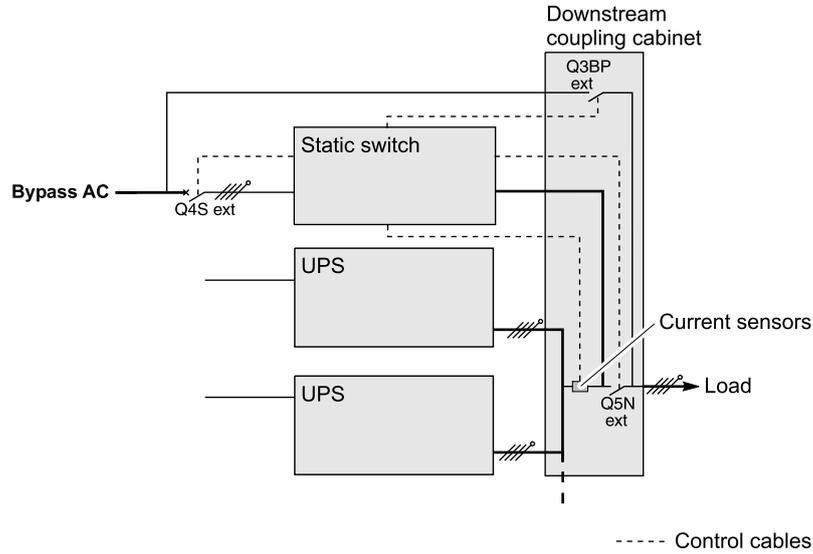
- For customer switches connection: 0.5 to 1.5 mm² / AWG20 to AWG16.

Suitable current sensors must be used to ensure correct operation of the installation.

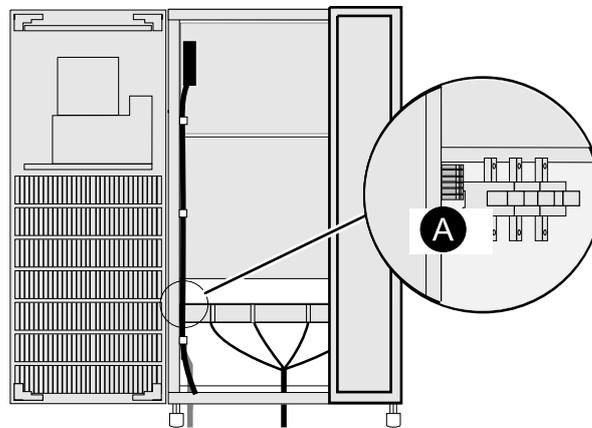
Recommended current sensor characteristics are: TI 4000/1, class 1, 10 VA. Please contact Schneider Electric for more information.

Customer switches Q4S ext, Q3BP ext, and Q5N ext must be electrically wired to behave like static switch cabinet switches.

The auxiliary contact of a customer switch must be a normally open contact when the switch is open.

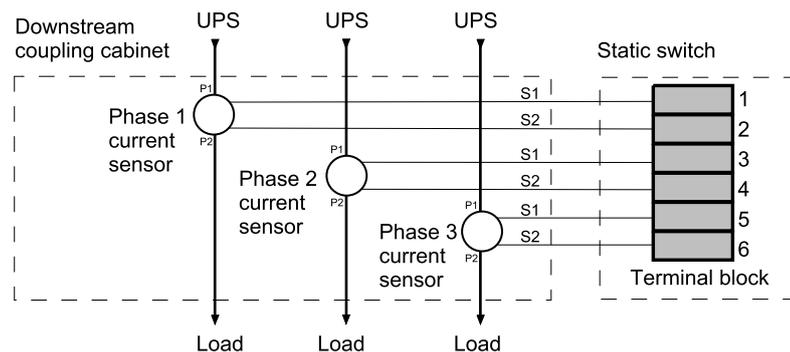


Static Switch Cabinet



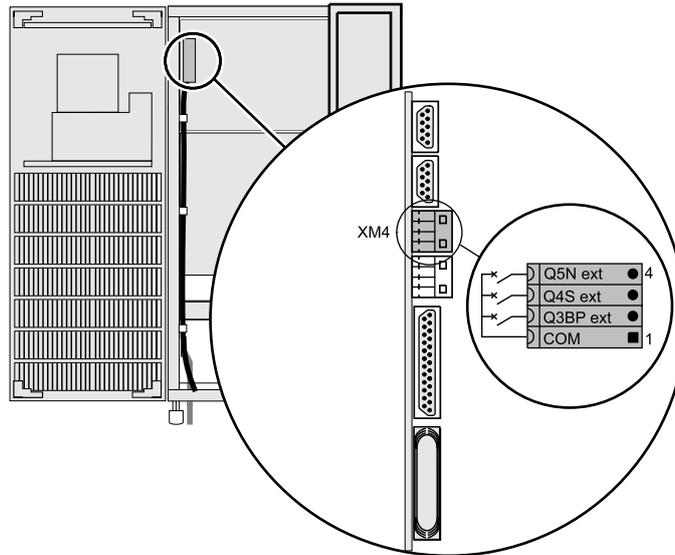
A. Terminal block

1. Connect the terminal block connectors to the current sensors in the connection panel.



2. Connect static switch XM4 connector to switches Q5N ext, Q4S ext and Q3BP ext.

Static Switch Cabinet



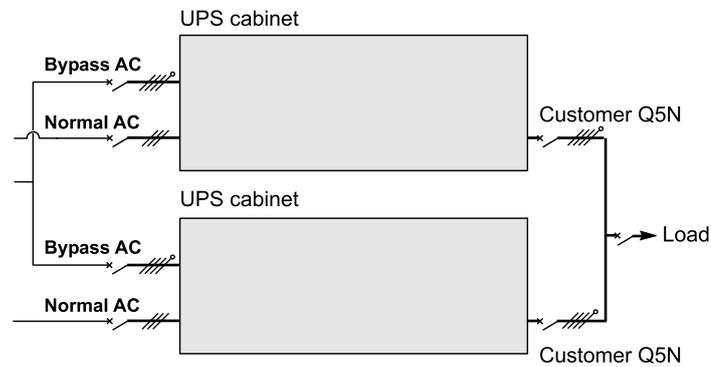
3. Run the cables behind protective covers, as shown in the cabinet. Control cables and power cables must run apart.
4. Run the cables along with the earth cables outside the cabinet.

Connect Control Cables to Customer Q5N Switch

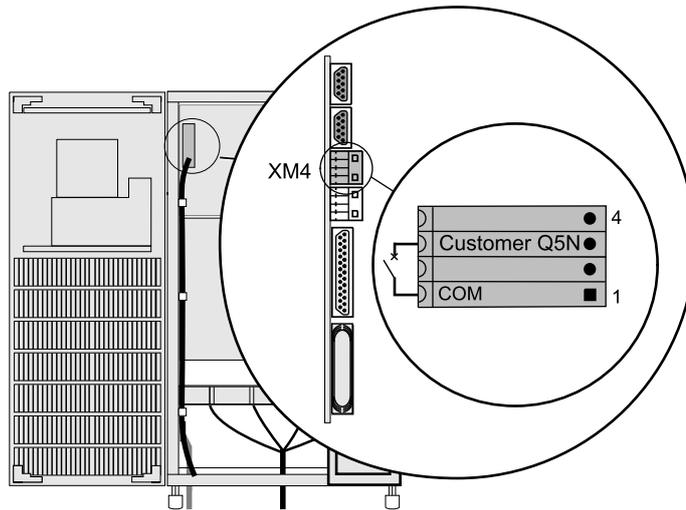
Only valid for parallel or integrated parallel UPS cabinets.

There must be only one customer Q5N switch per UPS.

The auxiliary contact of a customer switch must be a normally open contact.



1. Connect UPS XM4 to the customer Q5N.



2. Path the cables behind protective covers, as shown in the cabinet. Control cables and power cables must run apart.
3. Run the cables with the earth cables outside the cabinet.

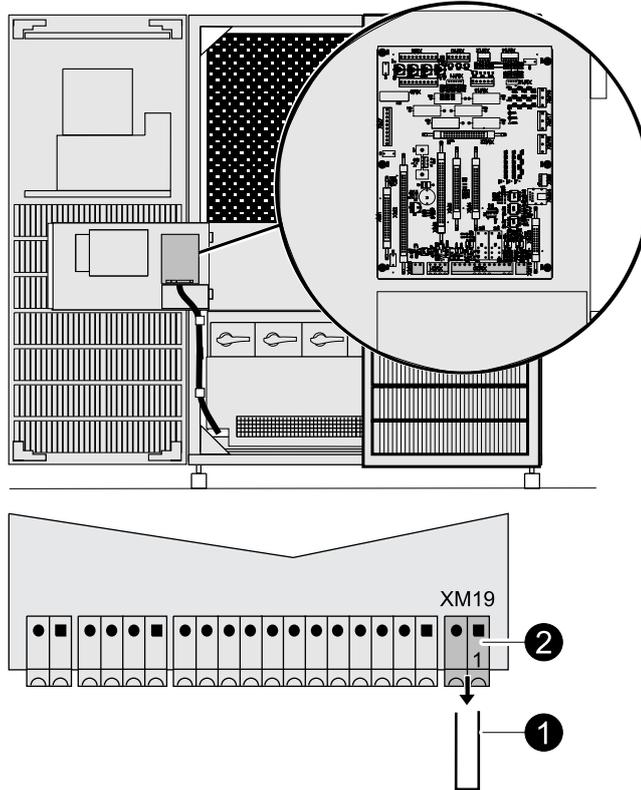
Connect the Emergency Power Off (EPO)

NOTE: In the UPS or the static switch cabinet, the general shutdown causes UPS shutdown and the opening of the battery circuit breaker (without opening of the bypass static switch depending on the personalization settings). The EPO notion is applicable to installations where pressing the button also causes the circuit breakers on the upstream normal AC source and bypass AC source to open. In parallel configurations, there must be a single general shutdown button with a separate contact for each UPS unit.

⚠ WARNING
HAZARD OF FIRE
<ul style="list-style-type: none">• Protect the battery circuit with a DC circuit breaker equipped with an undervoltage coil (MN 24 VDC).• The DC breaker must be rated 660 VDC. The undervoltage coil must be wired to the UPS as shown in <i>Mount Battery Circuit Breaker Kit, page 69</i>.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

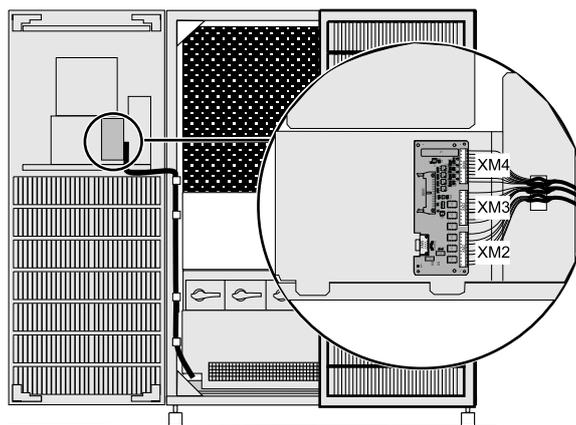
The cables (not supplied) must have SELV insulation and the maximum size is 2.5 mm².

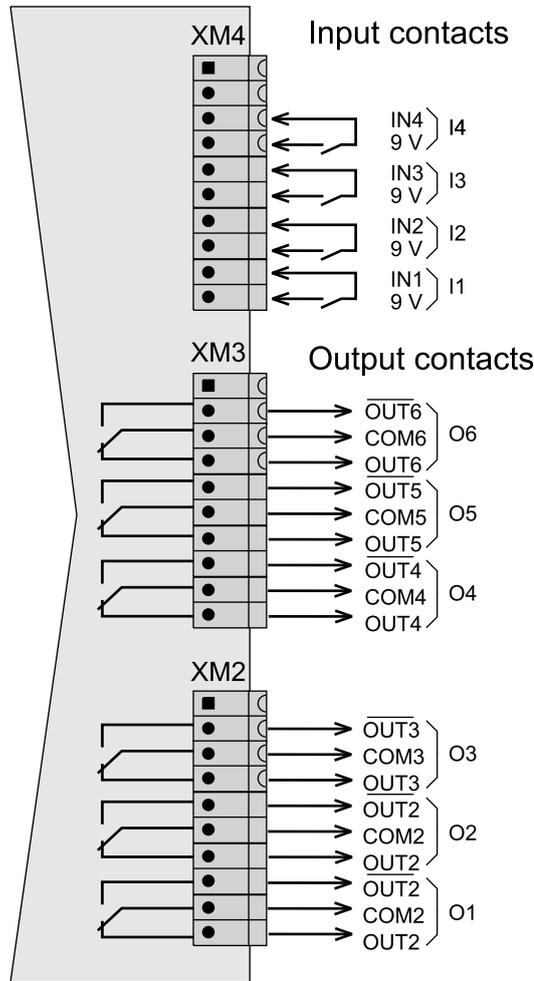
NOTE: To ensure sufficient isolation of EPO cables, they must be run separately from the power cables.



1. Remove the jumper from the XM19 terminal block.
2. Connect the general shutdown NC contact to terminals 1 and 2 (SELV) (Free of voltage).
3. Run the cables in the cabinet as shown.
4. Use cable ties to fasten the cables.
5. Run the cables outside the cabinets with the earth and connection cables between the cabinets.

Connect the Dry Contact Communication Card





Maximum characteristics of input contacts:

- Switched voltage: 9 VDC (supplied by the UPS)
- Loop current: 20 mA
- Wire size: 0.5 to 1.5 mm²/AWG20 to AWG16

NOTE: In installations with parallel UPS, the input contacts must be unique and include a separate contact for each UPS.

Maximum characteristics of output contacts:

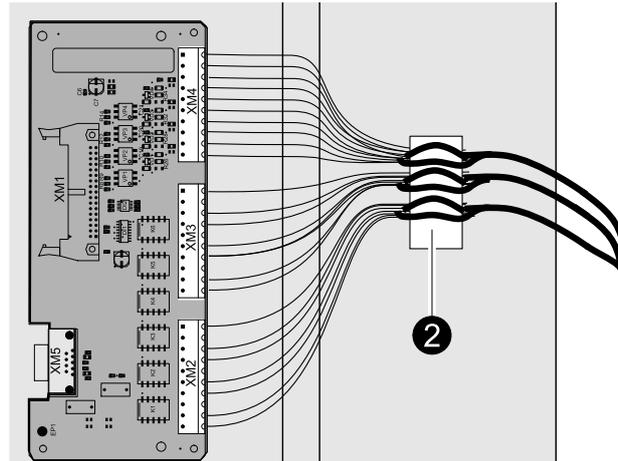
- Permissible voltage: SELV only
- Permissible current: 1 A at 30 VDC/30 VAC
- Wire size: 0.5 to 1.5 mm²/AWG20 to AWG16

NOTE: The dry contacts can be configured; see "Configure the Dry Contacts" in the operation manual.

NOTE: To ensure sufficient isolation of contact signal cables, they must be run separately from the power cables.

1. Connect the cables to input/output contacts.

2. Pass the wires through the ferrite two times.



3. Run the cables in the cabinet as shown.
4. Use cable ties to fasten the cables.
5. Run the cables outside the cabinet with the earth and connection cables between the cabinets.
6. Reinstall the protective covers.

Install an External Battery Cabinet (Option)

Install Empty Battery Cabinet

Mount Battery Circuit Breaker Kit

⚠ DANGER

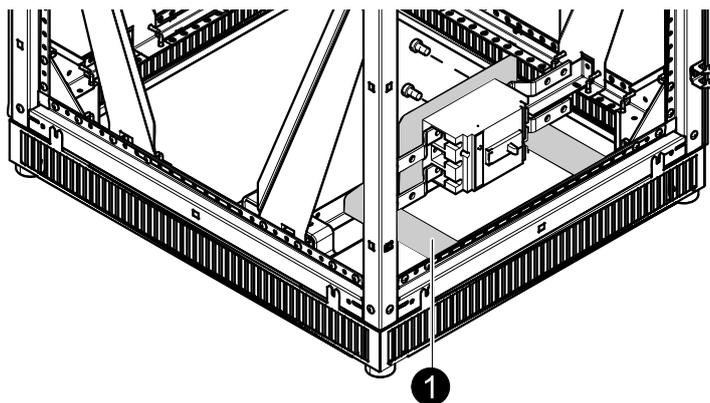
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- It is mandatory to protect the battery circuit with a circuit breaker equipped with an undervoltage coil (MN 24V DC).
- Circuit breaker type and rating must be compliant with battery specifications and battery protection given.

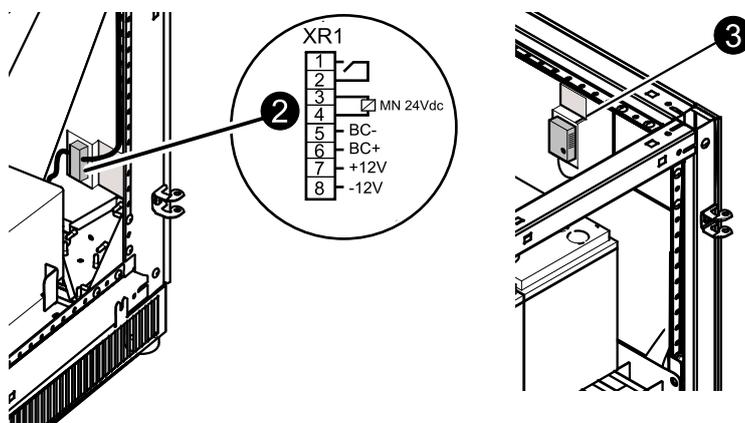
Failure to follow these instructions will result in death or serious injury.

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

1. Install the circuit breaker back plate and the circuit breaker with screws in the battery cabinet.

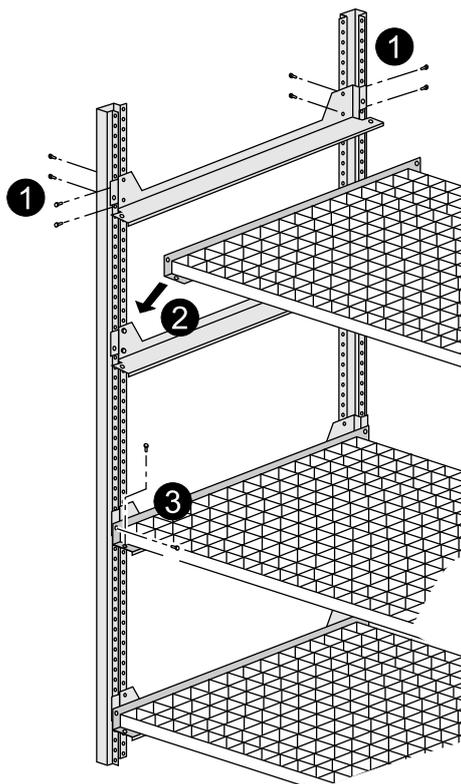


2. Install connector XF1 on connector XR1.
3. Install the temperature sensor.



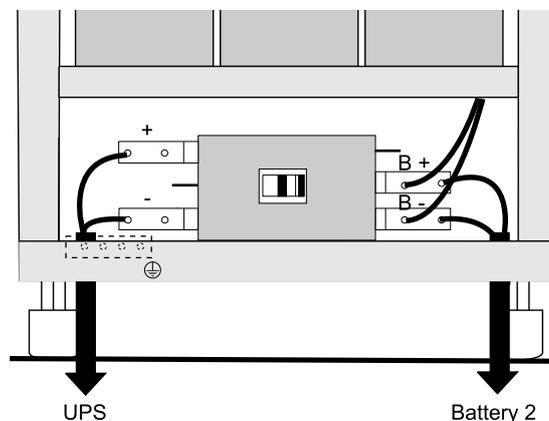
Mount the Shelves

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

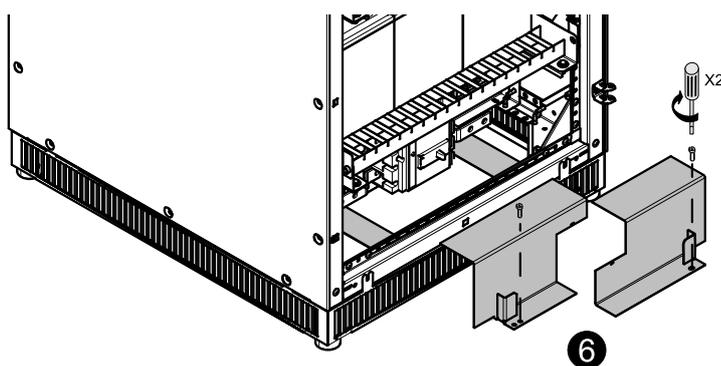


1. Install the corner supports (eight screws per support).
2. Install the shelf.
3. Fasten the shelf with two screws in each corner.

Connect Battery Cables from the UPS Cabinet to the Battery Cabinet



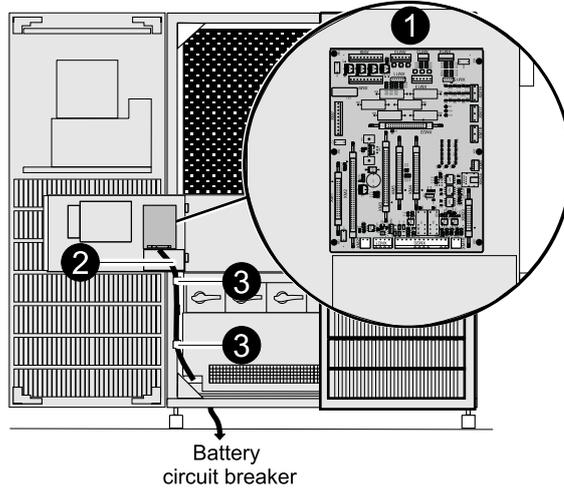
1. Ensure that the battery circuit breaker is in the open position.
2. Connect the PE cable to the earth bar in the battery cabinet.
3. Connect the positive battery cable from the UPS cabinet (+) to the positive terminal in the battery cabinet.
4. Connect the negative battery cable from the UPS cabinet (-) to the negative terminal in the battery cabinet.
5. Connect the batteries on the shelves of the battery cabinets to the battery circuit breaker in the battery cabinet.
6. Install and fasten the protective cover with the supplied screws.



Connect the Battery Signal Cables

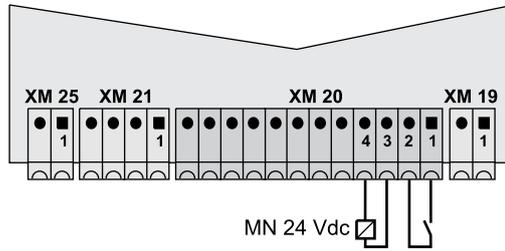
The cables (not supplied) must have SELV insulation, with size 0.5 to 1.5 mm²/ AWG20 to AWG16.

NOTE: To ensure sufficient isolation of control-wire cables, they must be run separately from the power cables.

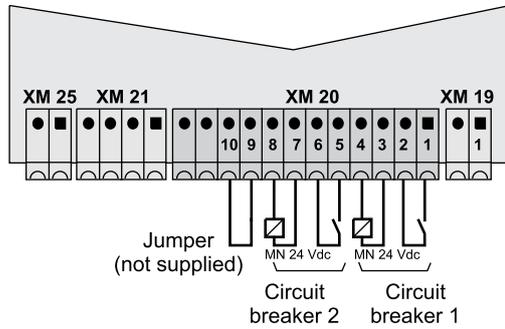


NOTE: MN 24 VDC coil must be used for battery circuit breaker monitoring (EPO and protection).

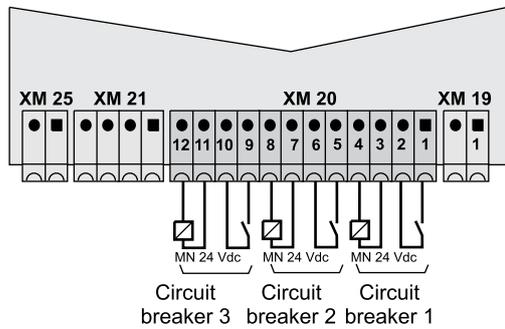
Connect a Single Battery Circuit Breaker



Connect Two Battery Circuit Breakers



Connect Three Battery Circuit Breakers



1. Connect the signal cables from the UPS cabinet to the battery circuit breaker in the battery cabinet.
2. Run the cables in the cabinet as shown.
3. Use cable ties to fasten the cables.

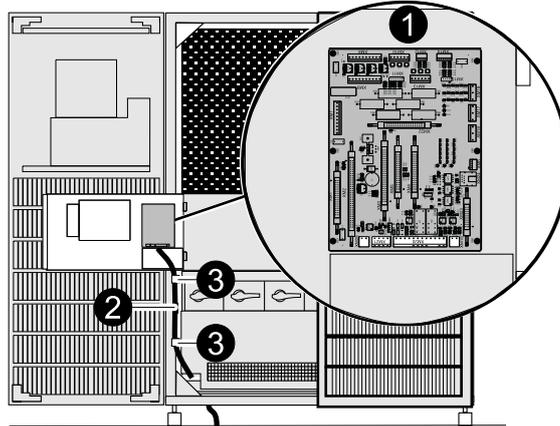
- Run the signal cables outside the cabinet along the earth and connection cables between the cabinets.

Connect the Battery Temperature Sensor

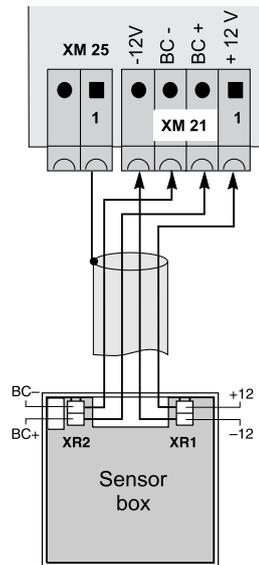
The cables (not supplied) must be shielded, twisted-pair cables, with a size of 0.3 to 1.5 mm²/AWG22 to AWG16 and a maximum length of 100 m.

NOTE: To ensure sufficient isolation of control-wire cables, they must be run separately from the power cables.

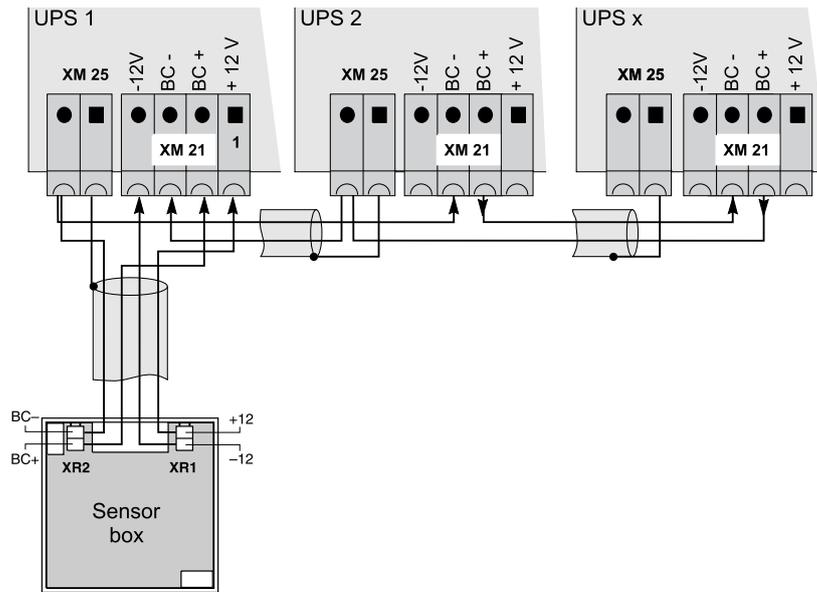
The temperature sensor can be located in a battery cabinet or in a battery room for batteries on racks.



Connect a Sensor to a Single UPS



Connect a Sensor to Several UPS



1. Connect the UPS cabinet to the temperature sensor in the battery room or in the battery cabinet (cables not supplied).
2. Run the cables in the cabinet as shown.
3. Use cable ties to fasten the cables.
4. Run the cables outside the cabinet along the earth and connection cables between the cabinets.

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As standards, specifications, and design change from time to time,
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