

Easy UPS 3M

60-100 kVA 400 V and 50 kVA 208 V for External Batteries

Installation

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IEC (380/400/415 V)



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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 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**

The UPS must use an external regenerative braking kit to dissipate energy when connected to regenerative loads 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.
- 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. The disconnection device must be easily accessible and visible.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

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

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠ CAUTION**RISK OF ELECTRICAL DISTURBANCE**

This product can cause a DC current in the PE conductor. Where a residual current-operated protective device (RCD) is used for protection against electrical shock, only an RCD of Type B is allowed on the supply side of this product.

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

Battery Safety

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

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

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

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

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

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

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

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

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

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

















⚠ CAUTION

RISK OF EQUIPMENT DAMAGE

- 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.

Symbols Used in the Product

	This is the earthing/ground symbol.
	This is the protective earth/equipment grounding conductor symbol.
	This is the direct current symbol. It is also referred to as DC.
	This is the alternating current symbol. It is also referred to as AC.
	This is the positive polarity symbol. It is used to identify the positive terminal(s) of equipment which is used with, or generates direct current.
	This is the negative polarity symbol. It is used to identify the negative terminal(s) of equipment which is used with, or generates direct current.
	This is the battery symbol.
	This is the static bypass switch symbol. It is used to indicate switches that are designed to bypass the UPS normal operation, in cases of high inrush or fault conditions.
	This is the AC/DC converter (rectifier) symbol. It is used to identify an AC/DC converter (rectifier) and, in case of plug-in devices, to identify the relevant receptacles.
	This is the DC/AC converter (inverter) symbol. It is used to identify an DC/AC converter (inverter) and, in case of plug-in devices, to identify the relevant receptacles.
	This is the fuse symbol. It is used to identify fuse boxes or their locations.
	This is the input symbol. It is used to identify an input terminal when it is necessary to distinguish between inputs and outputs.
	This is the output symbol. It is used to identify an output terminal when it is necessary to distinguish between inputs and outputs.
	This is the switch disconnecter symbol. It is used to identify the disconnecting device in the form of switch that protects the equipment from short circuit or heavy load current. It opens the circuits once the current flow crosses its maximum limit.
	This is the circuit breaker symbol. It is used to identify the disconnecting device in the form of circuit breaker that protects the equipment from short circuit or heavy load current. It opens the circuits once the current flow crosses its maximum limit.
	This is the circuit breaker/switch symbol. It is used to identify the disconnecting device in the form of circuit breaker or switch that protects the equipment from short circuit or heavy load current. It opens the circuits once the current flow crosses its maximum limit.

N	This is the neutral symbol. It is used to identify the neutral conductors or their locations.
L	This is the phase conductor symbol. It is used to identify the phase conductors or their locations.

Specifications

Specifications for 400 V Systems

Input Specifications

	60 kVA			80 kVA			100 kVA		
Voltage (V)	380	400	415	380	400	415	380	400	415
Connections ¹	L1, L2, L3, N, PE								
Input voltage range (V)	342-477 at full load ²								
Frequency range (Hz)	40-70								
Nominal input current (A)	96	91	88	128	122	117	160	152	146
Maximum input current (A)	109	104	100	154	146	141	186	177	170
Input current limitation (A)	155			206			258		
Total harmonic distortion (THDI)	<3% for linear loads								
Input power factor	> 0.99								
Maximum short circuit rating	Icc=10 kA								
Protection	Fuse								
Ramp-in	7 seconds								

Bypass Specifications

	60 kVA			80 kVA			100 kVA		
Voltage (V)	380	400	415	380	400	415	380	400	415
Connections	L1, L2, L3, N, PE								
Overload capacity	110% for 60 minutes 130% for 10 minutes 130–150% for 1 minute								
Minimum bypass voltage (V)	266	280	291	266	280	291	266	280	291
Maximum bypass voltage (V)	475	480	477	475	480	477	475	480	477
Frequency (Hz)	50 or 60								
Frequency range (%)	±1, ±2, ±4, ±5, ±10. Default is ±10 (user selectable).								
Nominal bypass current (A)	91	87	83	122	115	111	152	144	139
Maximum short circuit rating	Icw=10 kA								

1. It is mandatory to have the neutral line for the input and the load. If the input or the load does not have a neutral line, a Δ-Y transformer for input or a Y-Δ transformer for load needs to be installed. And the capacity of the transformer should be >1.2 times the rated capacity of the UPS.
2. 150-342 V with a linear derating of the load to 30%.

Output Specifications

	60 kVA			80 kVA			100 kVA		
Voltage (V)	380	400	415	380	400	415	380	400	415
Connections ³	L1, L2, L3, N, PE								
Overload capacity ⁴	110% for 60 minutes 125% for 10 minutes 150% for 1 minute								
Output voltage regulation	± 1%								
Dynamic load response	20 milliseconds								
Output power factor	1.0								
Nominal output current (A)	91	87	83	122	115	111	152	144	139
Total harmonic distortion (THDU)	<2% at 100% balanced linear load <5% at 100% non-linear load								
Output frequency (Hz)	50 or 60								
Slew rate (Hz/sec)	Programmable: 0.5 to 2.0. Default is 0.5								
Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111								
Load power factor	0.5 leading to 0.5 lagging without derating								
Output short circuit current	210 A/200 ms			330 A/200 ms			330 A/200 ms		

Battery Specifications

	60 kVA	80 kVA	100 kVA
Charging power in % of output power	1–20%	1–30%	1–24%
Maximum charging power (W)	12000	24000	24000
Nominal battery voltage (2x16–2x25 blocks ⁵) (VDC)	± 192 to ± 300		
Nominal float voltage (2x16–2x25 blocks ⁵) (VDC)	± 215.5 to ± 337.5		
End of discharge voltage (2x16–2x25 blocks) (VDC)	± 153.6 to ± 240		
Battery current at full load and nominal battery voltage (2x18–2x25 blocks) (A)	147–105	196–140	245–175
Battery current at full load and minimum battery voltage (2x18–2x25 blocks) (A)	185–132	246–176	308–221
Temperature compensation (per cell) ⁶	Programmable from 0–7 mV. Default is 0 mV		
Ripple current	< 5% C10		

3. It is mandatory to have the neutral line for the input and the load. If the input or the load does not have a neutral line, a Δ-Y transformer for input or a Y-Δ transformer for load needs to be installed. And the capacity of the transformer should be >1.2 times the rated capacity of the UPS.
4. At 30 °C.
5. 32–34 blocks are only possible when the load is <90%.
6. If the temperature is above 25 °C. If the temperature is below 25 °C, no compensation is needed.

Recommended Upstream Protection

NOTE: For local directives which require 4-pole circuit breakers: If neutral conductor is expected to carry a high current, due to line-neutral non-linear load, the circuit breaker must be rated according to expected neutral current.

	60 kVA		80 kVA		100 kVA	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	NSX160F 36kA AC 3P3D 125A TMD C16F3TM125	NSX100F 36kA AC 3P3D 100A TMD C10F3TM100	NSX160F 36kA AC 3P3D 160A TMD C16F3TM160	NSX160F 36kA AC 3P3D 160A TMD C16F3TM160	NSX250F 36kA AC 3P3D 200A TMD C25F3TM200	NSX160F 36kA AC 3P3D 160A TMD C16F3TM160
In setting	125	100	160	160	200	160
Ir setting	125	100	160	144	200	160
Im setting	1250 (fixed)	800 (fixed)	1250 (fixed)	1250 (fixed)	1000	1250 (fixed)

60 kVA selectivity of down stream circuit breaker: After 8.7 ms circuit breaker trip after short circuit, output without interruption. (Circuit breaker specifications: iC65H-C-16A)

Recommended Cables Sizes

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All wiring must comply with all applicable national and/or electrical codes. The maximum allowable cable size is 70 mm².

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

Cable sizes in this manual are based on table B.52.5 of IEC 60364-5-52 with the following assertions:

- 90 °C conductors
- An ambient temperature of 30 °C
- Use of copper conductors
- Installation method C

PE size is based on table 54.2 of IEC 60364-5-54.

If the ambient temperature is greater than 30 °C, larger conductors are to be used in accordance with the correction factors of the IEC.

NOTE: The battery cable sizes given here are recommendations – Always follow the specific instructions in the battery solution documentation for battery cable sizes and battery PE cable sizes and ensure that the battery cable sizes match the battery breaker rating.

NOTE: Recommended cable sizes and maximum allowable cable size may vary for the auxiliary products. Refer to the installation manual provided with the auxiliary product.

NOTE: Neutral conductor is sized to handle 1.73 times phase current in case of high harmonic content from non-linear loads. If non or less harmonic currents are expected, neutral conductor can be sized accordingly but not less than the phase conductor.

60 kVA

Copper

	Cable size per phase (mm ²)	Neutral cable size (mm ²)	PE cable size (mm ²)
Input	35	2x25	16
Bypass	25		16
Output	25	2x25	16
Battery	50	50	25

80 kVA

Copper

	Cable size per phase (mm ²)	Neutral cable size (mm ²)	PE cable size (mm ²)
Input	50	2x50	25
Bypass	50		25
Output	50	2x50	25
Battery	2x50	2x50	50

100 kVA

Copper

	Cable size per phase (mm ²)	Neutral cable size (mm ²)	PE cable size (mm ²)
Input	70	2x70	35
Bypass	70		35
Output	70	2x70	35
Battery	2x70	2x70	70

Heat Dissipation

	60 kVA		80 kVA		100 kVA	
	W	BTU/hr	W	BTU/hr	W	BTU/hr
Normal mode	3084	10523	4296	14659	5500	18767
Battery mode	2958	10093	4352	14850	5520	18835
ECO mode	540	1843	696	2375	1020	3480

Specifications for 208 V Systems

Input Specifications

	50 kVA		
Voltage (V)	200	208	220
Connections ⁷	L1, L2, L3, N, PE		
Input voltage range (V)	180-272 at full load ⁸		
Frequency range (Hz)	40-70		
Nominal input current (A)	159	152	143
Maximum input current (A)	170	163	154
Input current limitation (A)	254		
Total harmonic distortion (THDI)	<3% for linear loads		
Input power factor	> 0.99		
Maximum short circuit rating	Icc=10 kA		
Protection	Fuse		
Ramp-in	12 seconds		

Bypass Specifications

	50 kVA		
Voltage (V)	200	208	220
Connections	L1, L2, L3, N, PE		
Overload capacity	110% for 60 minutes 130% for 10 minutes 130–150% for 1 minute		
Minimum bypass voltage (V)	140	146	154
Maximum bypass voltage (V)	250	260	275
Frequency (Hz)	50 or 60		
Frequency range (%)	±1, ±2, ±4, ±5, ±10. Default is ±10 (user selectable).		
Nominal bypass current (A)	147	141	133
Maximum short circuit rating	Icw=10 kA		

7. It is mandatory to have the neutral line for the input and the load. If the input or the load does not have a neutral line, a Δ -Y transformer for input or a Y- Δ transformer for load needs to be installed. And the capacity of the transformer should be >1.2 times the rated capacity of the UPS.
8. 126-180 V with a linear derating of the load to 30%.

Output Specifications

	50 kVA		
Voltage (V)	200	208	220
Connections ⁹	L1, L2, L3, N, PE		
Overload capacity ¹⁰	110% for 60 minutes 125% for 10 minutes 150% for 1 minute		
Output voltage regulation	± 1%		
Dynamic load response	20 milliseconds		
Output power factor	1.0		
Nominal output current (A)	144	139	131
Total harmonic distortion (THDU)	<3% at 100% linear load <5% at 100% non-linear load		
Output frequency (Hz)	50 or 60		
Slew rate (Hz/sec)	Programmable: 0.5 to 2.0. Default is 0.5		
Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111		
Load power factor	0.5 leading to 0.5 lagging without derating		
Output short circuit current	330 A/200 ms		

Battery Specifications

	50 kVA
Charging power in % of output power	1-38.4%
Maximum charging power (W)	19200
Nominal battery voltage (2x16 - 2x20 blocks) (VDC)	± 192 to ± 240
Nominal float voltage (2x16 - 2x20 blocks) (VDC)	± 215.5 to ± 270
End of discharge voltage (2x16 - 2x20 blocks) (VDC)	± 153.6 to ± 192
Battery current at full load and nominal battery voltage (2x16 - 2x20 blocks) (A)	140-112
Battery current at full load and minimum battery voltage (2x16 - 2x20 blocks) (A)	175-140
Temperature compensation (per cell) ¹¹	Programmable from 0-7 mV. Default is 0 mV
Ripple current	< 5% C10

9. It is mandatory to have the neutral line for the input and the load. If the input or the load does not have a neutral line, a Δ-Y transformer for input or a Y-Δ transformer for load needs to be installed. And the capacity of the transformer should be >1.2 times the rated capacity of the UPS.

10. At 30 °C.

11. If the temperature is above 25 °C. If the temperature is below 25 °C, no compensation is needed.

Recommended Upstream Protection

NOTE: For local directives which require 4-pole circuit breakers: If neutral conductor is expected to carry a high current, due to line-neutral non-linear load, the circuit breaker must be rated according to expected neutral current.

	50 kVA	
	Input	Bypass
Breaker type	NSX250F 36kA AC 3P3D 200A TMD C25F3TM200	NSX160F 36kA AC 3P3D 160A TMD C16F3TM160
In setting	200	160
Ir setting	200	160
Im setting	1000	1250 (fixed)

Recommended Cable Sizes

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All wiring must comply with all applicable national and/or electrical codes. The maximum allowable cable size is 70 mm².

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

Cable sizes in this manual are based on table B.52.5 of IEC 60364-5-52 with the following assertions:

- 90 °C conductors
- An ambient temperature of 30 °C
- Use of copper conductors
- Installation method C

PE size is based on table 54.2 of IEC 60364-5-54.

If the ambient temperature is greater than 30 °C, larger conductors are to be used in accordance with the correction factors of the IEC.

NOTE: The battery cable sizes given here are recommendations – Always follow the specific instructions in the battery solution documentation for battery cable sizes and battery PE cable sizes and ensure that the battery cable sizes match the battery breaker rating.

NOTE: Recommended cable sizes and maximum allowable cable size may vary for the auxiliary products. Refer to the installation manual provided with the auxiliary product.

NOTE: Neutral conductor is sized to handle 1.73 times phase current in case of high harmonic content from non-linear loads. If non or less harmonic currents are expected, neutral conductor can be sized accordingly but not less than the phase conductor.

50 kVA

Copper

	Cable size per phase (mm ²)	Neutral cable size (mm ²)	PE cable size (mm ²)
Input	70	2x70	35
Bypass	70		35

Copper (Continued)

	Cable size per phase (mm ²)	Neutral cable size (mm ²)	PE cable size (mm ²)
Output	70	2x70	35
Battery	70	70	35

Heat Dissipation

50 kVA

	W	BTU/hr
Normal mode	4648	15859
Battery mode	3528	12038
ECO mode	890	3037

Recommended Bolts and Cable Lugs

Cable size (mm ²)	Bolt size	Cable lug type
16	M8	KST TLK16-8
25	M8	KST TLK25-8
35	M8	KST TLK35-8
50	M8	KST TLK50-8
70	M8	KST TL70-8

NOTE: If the recommended lug type is not available, use a local M8 lug type as a substitute.

Torque Specifications

Bolt Size	Torque
M8	17.5 Nm

Requirements for a Third Party Battery Solution

Battery breaker boxes from Schneider Electric are recommended for the battery interface. Please contact Schneider Electric for more information.

Third Party Battery Breaker Requirements

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All selected battery breakers must be equipped with instantaneous trip functionality with an undervoltage release coil or a shunt trip release coil.

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

NOTE: There are more factors to consider when selecting a battery breaker than the requirements listed below. Please contact Schneider Electric for more information.

Design Requirements for Battery Breaker

Battery breaker rated DC voltage > Normal battery voltage	The normal voltage of the battery configuration is defined as the highest nominal occurring battery voltage. This can be equivalent to the float voltage which may be defined as number of battery blocks x number of cells x cell float voltage .
Battery breaker rated DC current > Rated discharge battery current	This current is controlled by the UPS and must include maximum discharge current. This will typically be the current at the end of discharge (minimum operation DC voltage or in overload condition or a combination).
DC landings	Three DC landings (+, -, N) for DC cables are required.

Design Requirements for Battery Breaker (Continued)

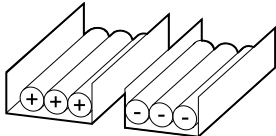
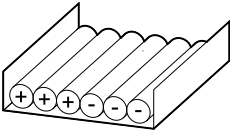
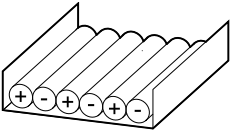
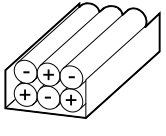
AUX switches for monitoring	One AUX switch must be installed in each battery breaker and connected to the UPS. The UPS can monitor one battery breaker.
Short-circuit breaking capability	The short-circuit breaking capability must be higher than the short-circuit DC current of the (largest) battery configuration.
Minimum trip current	The minimum short-circuit current to trip the battery breaker must match the (smallest) battery configuration, to make the breaker trip in case of a short circuit, up to the end of its life time.

Guidance for Organizing Battery Cables

NOTE: For 3rd party batteries, use only high rate batteries for UPS applications.

NOTE: When the battery bank is placed remotely, the organizing of the cables is important to reduce voltage drop and inductance. The distance between the battery bank and the UPS must not exceed 200 m (656 ft). Contact Schneider Electric for installations with a longer distance.

NOTE: To minimize the risk of electromagnetic radiation, it is highly recommended to follow the below guidance and to use grounded metallic tray supports.

Cable Length				
<30 m	Not recommended	Acceptable	Recommended	Recommended
31–75 m	Not recommended	Not recommended	Acceptable	Recommended
76–150 m	Not recommended	Not recommended	Acceptable	Recommended
151–200 m	Not recommended	Not recommended	Not recommended	Recommended

UPS Shipping Weights and Dimensions

UPS	Weight kg	Height mm	Width mm	Depth mm
60 kVA 400 V	133	1140	475	965
80 kVA 400 V	164	1140	475	965
100 kVA 400 V/50 kVA 208 V	169	1140	475	965

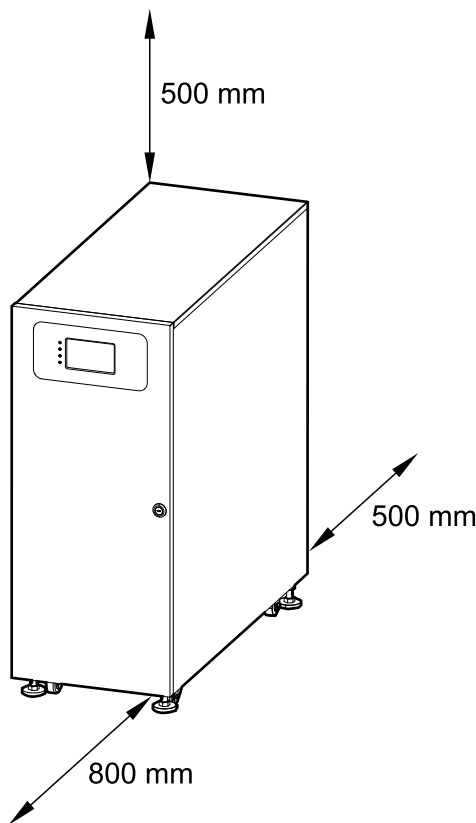
UPS Weights and Dimensions

UPS	Weight kg	Height mm	Width mm	Depth mm
60 kVA 400 V	109	915	360	850
80 kVA 400 V	140	915	360	850
100 kVA 400 V/50 kVA 208 V	145	915	360	850

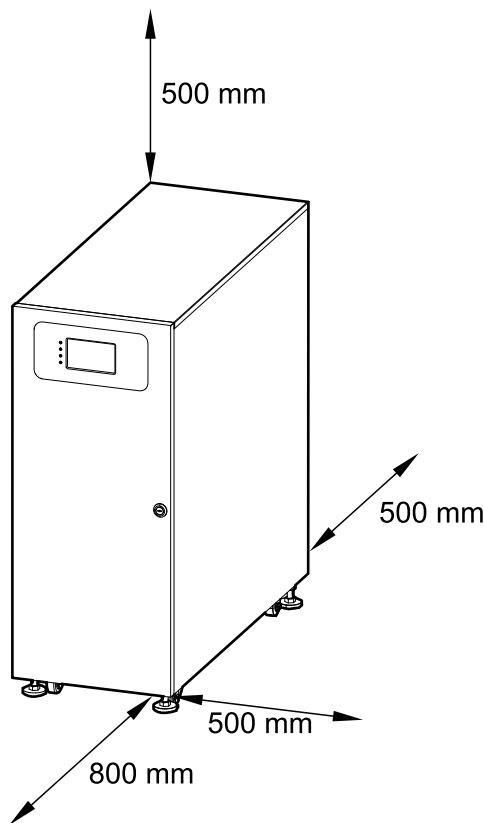
Clearance

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.

Option A



Option B



NOTE: If the UPS is installed without side access, the length of the cables connected to the UPS must allow for rolling out the UPS.

Environmental

	Operating	Storage
Temperature	0 °C to 40 °C Recommended optimal temperature for batteries: 20 °C to 25 °C	-15 °C to 40 °C for systems with batteries -25 °C to 55 °C for systems without batteries
Relative humidity	0–95% non-condensing	
Elevation According to IEC 62040–3	Power derating factor: 0-1500 m: 1.000 1500-2000 m: 0.975	< 15000 m above sea level (or in an environment with equivalent air pressure)
Audible noise	<65 dBA at full load and an ambient temperature of 30 °C ¹²	
Protection class	IP20 (dust filter as standard)	
Color	RAL 9003	

Compliance

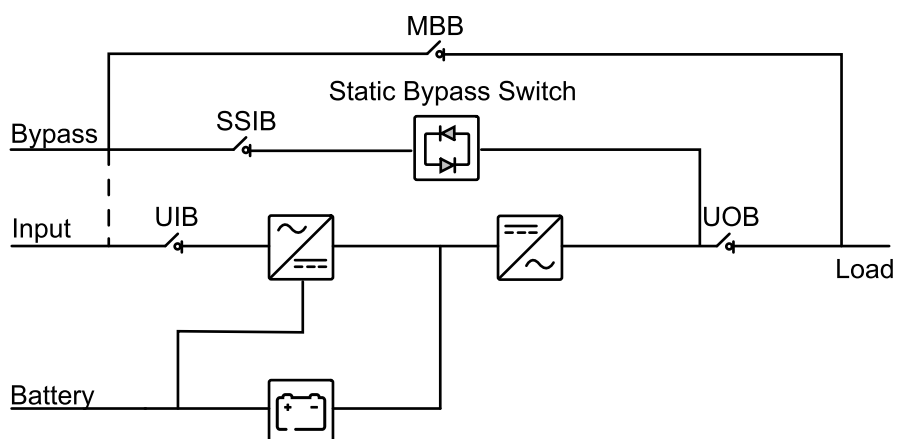
Safety	IEC 62040-1:2017, Edition 2.0, Uninterruptible power systems (UPS) – Part 1: Safety requirements IEC 62040-1: 2008-6, 1st edition, Uninterruptible Power Systems (UPS) – Part 1: General and safety requirements for UPS IEC 62040-1:2013-01, 1st edition amendment 1
EMC/EMI/RFI	IEC 62040-2:2016, Edition 3.0, Uninterruptible power systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements. IEC 62040-2:2005-10, 2nd edition, Uninterruptible Power Systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements
Performance	IEC 62040-3: 2011-03, 2nd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements
Markings	CE, RCM, EAC, WEEE, UKCA
Transportation	ISTA 2B
Pollution degree	2
Overvoltage category	III
Earthing system	TN, TT, or IT

12. According to ISO 3746.

Overview

Overview of Single UPS

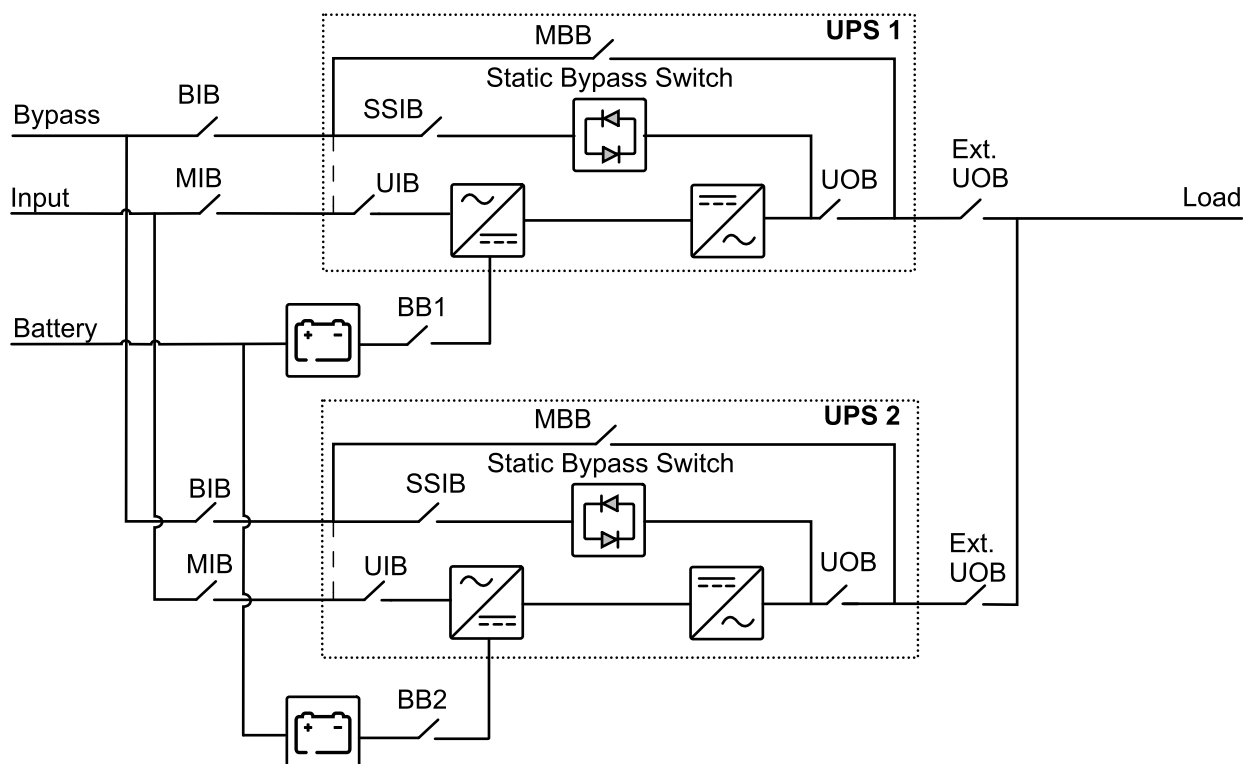
UIB	Unit input switch
SSIB	Static switch input switch
UOB	Unit output switch
MBB	Maintenance bypass switch



Overview of 1+1 Redundant Parallel System with Common Battery Bank

MIB	Mains input breaker
BIB	Bypass input breaker
UIB	Unit input switch
SSIB	Static switch input switch
UOB	Unit output switch
Ext. UOB	External unit output breaker
MBB	Maintenance bypass switch
Ext. MBB	External maintenance bypass breaker
BB1	Battery breaker 1
BB2	Battery breaker 2

NOTE: Common battery banks are not supported in systems with internal batteries.

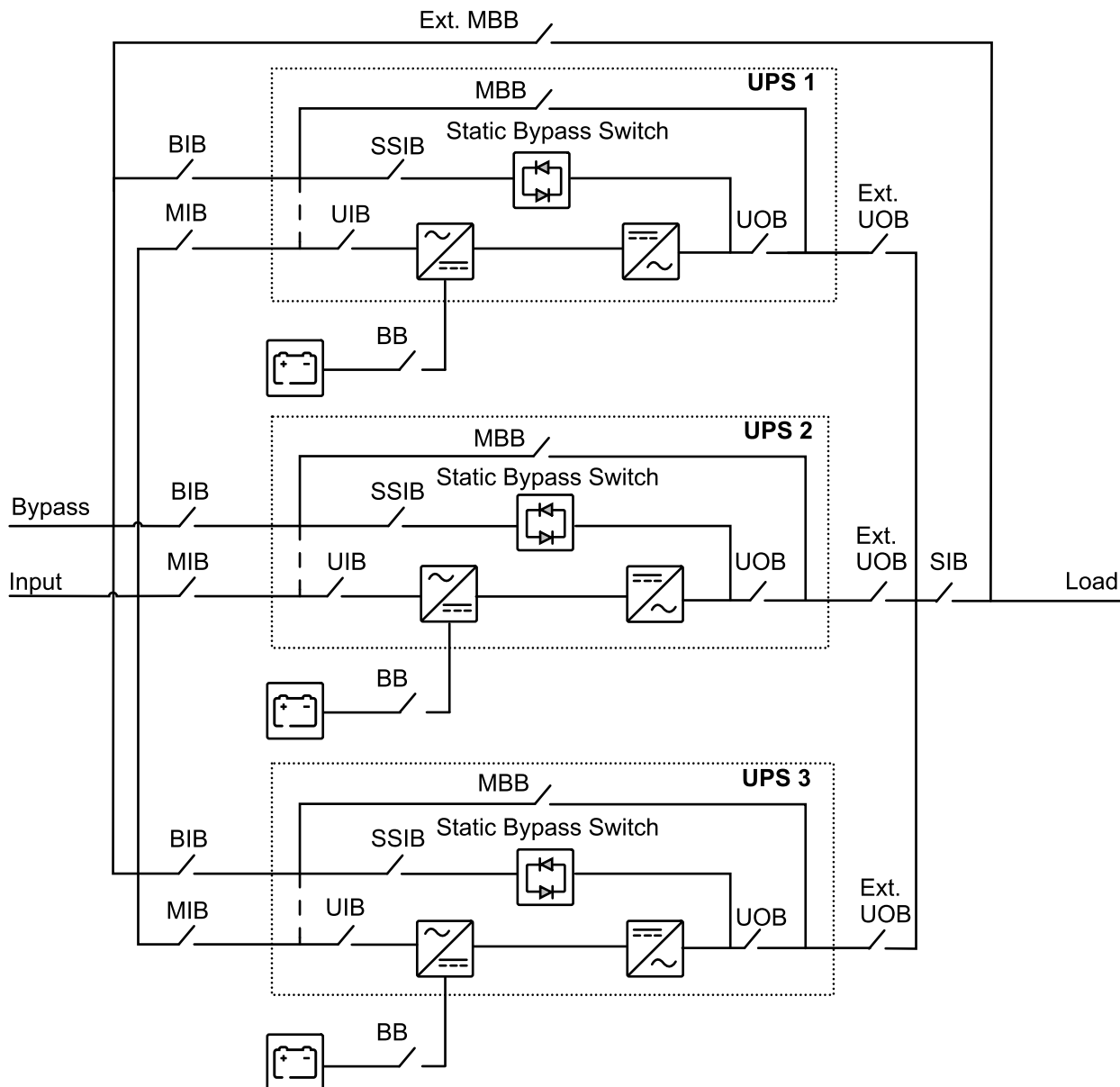


Overview of Parallel System

MIB	Mains input breaker
BIB	Bypass input breaker
UIB	Unit input switch
SSIB	Static switch input switch
UOB	Unit output switch
Ext. UOB	External unit output breaker
MBB	Maintenance bypass switch
Ext. MBB	External maintenance bypass breaker
SIB	System isolation breaker
BB	Battery breaker

NOTE: In parallel systems with an external maintenance bypass breaker Ext. MBB, the maintenance bypass breakers/switches MBB must be padlocked in the open (OFF) position.

UPSs for External Batteries



The impedance of the bypass paths need to be controlled in a parallel UPS system. When operating in bypass mode, the parallel load sharing is determined by the total impedance of the bypass path comprising cables, switchgear, static bypass switch, and cable formation.

NOTICE

RISK OF EQUIPMENT DAMAGE

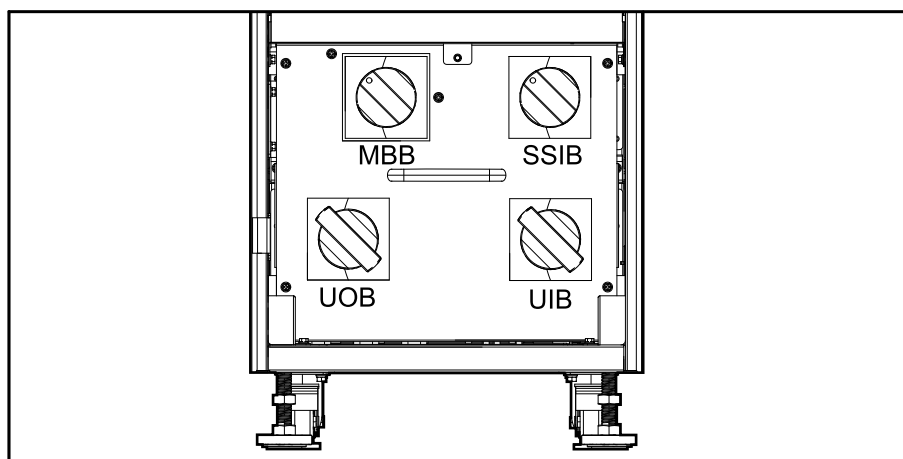
To ensure correct load sharing in bypass operation in a parallel system, the following recommendations apply:

- The bypass cables must be the same length for all UPSs.
- The output cables must be the same length for all UPSs.
- The input cables must be the same length for all UPSs in a single mains system.
- Cable formation recommendations must be followed.
- The reactance of busbar layout in the bypass/input and output switchgear must be the same for all UPSs.

If the above recommendations are not followed the result can be uneven load sharing in bypass and overload of individual UPSs.

Failure to follow these instructions can result in equipment damage.

Location of Breakers and Switches



Installation Procedure

1. Remove the UPS from the Pallet, page 33.
2. **Only for TNC system:** Prepare System for TNC Earthing, page 36.
3. Connect the Power Cables, page 37.
4. Connect the signal cables. See Communication Interfaces, page 39 and Input Contacts and Output Relays, page 40 for details.
5. **Only for parallel systems:** Connect the Signal Cables in Parallel Systems, page 42.
6. **Optional:** Connect Synchronization Cables Between Two UPS Systems (Option), page 43.

Receiving

External Inspection

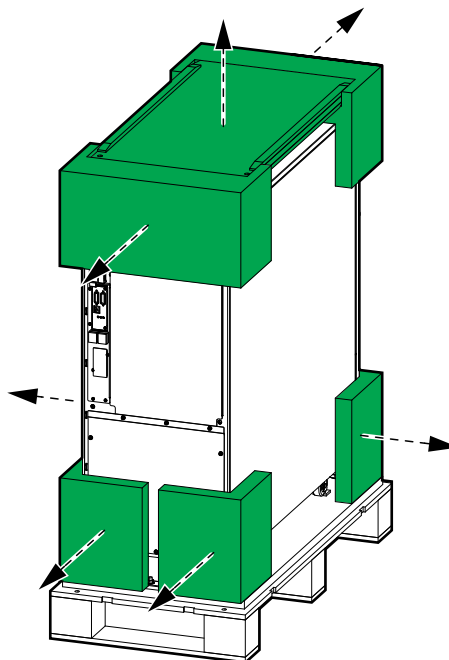
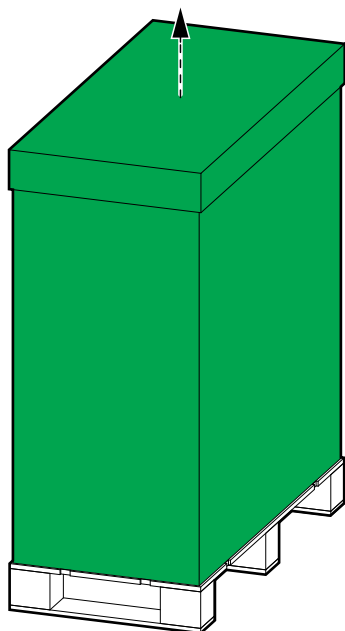
When the shipment arrives, inspect the shipping material for any signs of damage or mishandling. Do not attempt to install the system if a damage is apparent. If any damage is noted, contact Schneider Electric and file a damage claim with the shipping agency within 24 hours.

Compare the components of the shipment with the bill of lading. Report any missing items to the carrier and to Schneider Electric immediately.

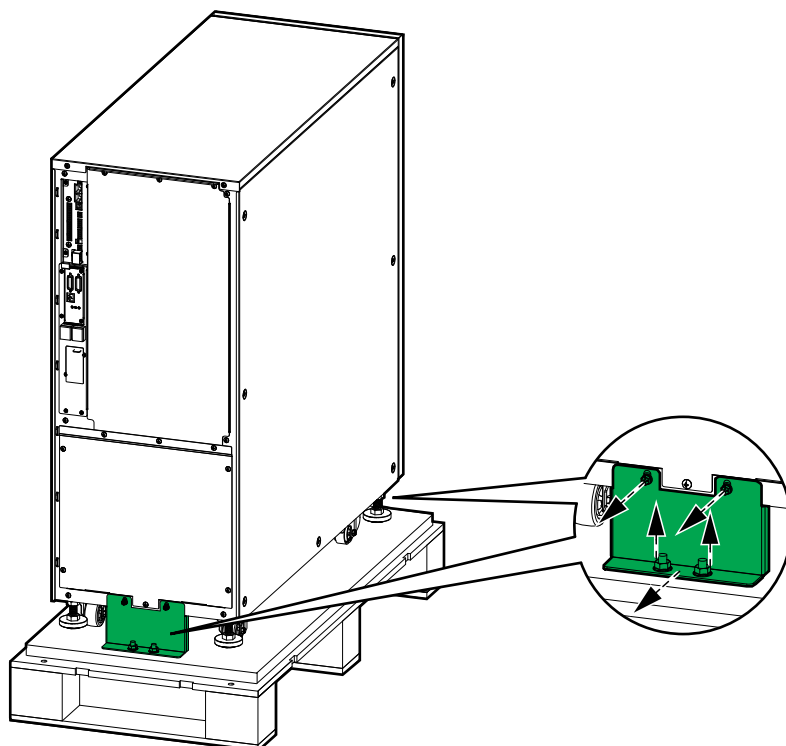
Verify that labelled units match the order confirmation.

Remove the UPS from the Pallet

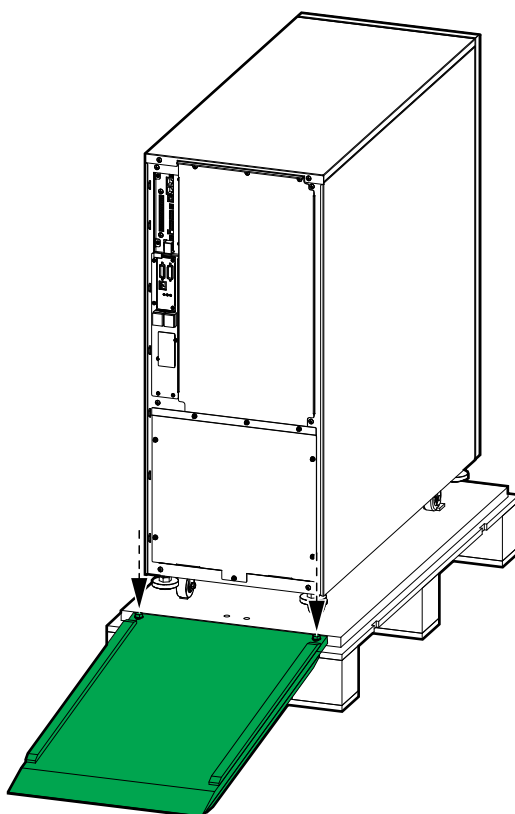
1. Move the UPS to the final installation area using a forklift.
2. Remove the shipping materials and the ramp from the UPS.



3. Loosen the bolts and remove the shipping brackets. Save the bolts for the ramp and dispose of the shipping brackets.

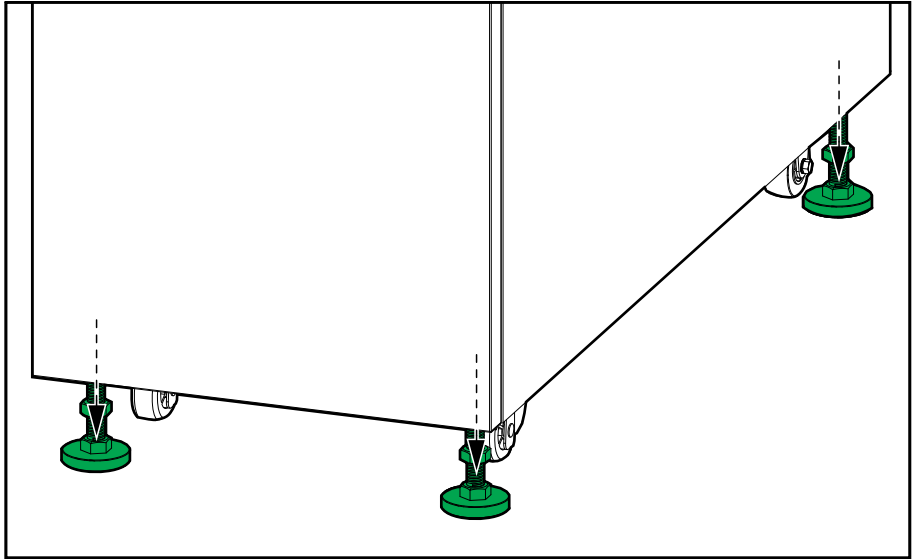


4. Place the ramp on the pallet and fasten with the bolts from the shipping bracket.



5. Roll the UPS down from the pallet.

6. Move the UPS to its final location and use a wrench to lower the levelling feet. Ensure that the cabinet is level.



7. Lock the wheels.

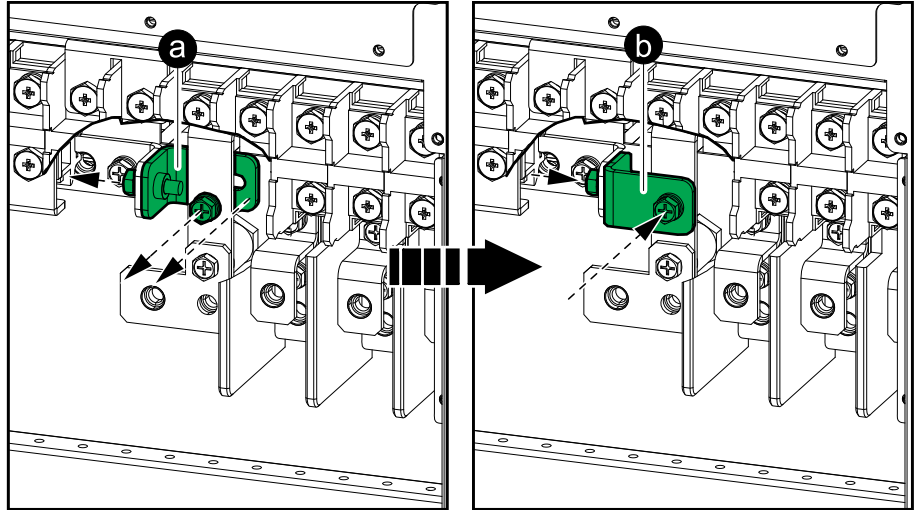


Prepare System for TNC Earthing

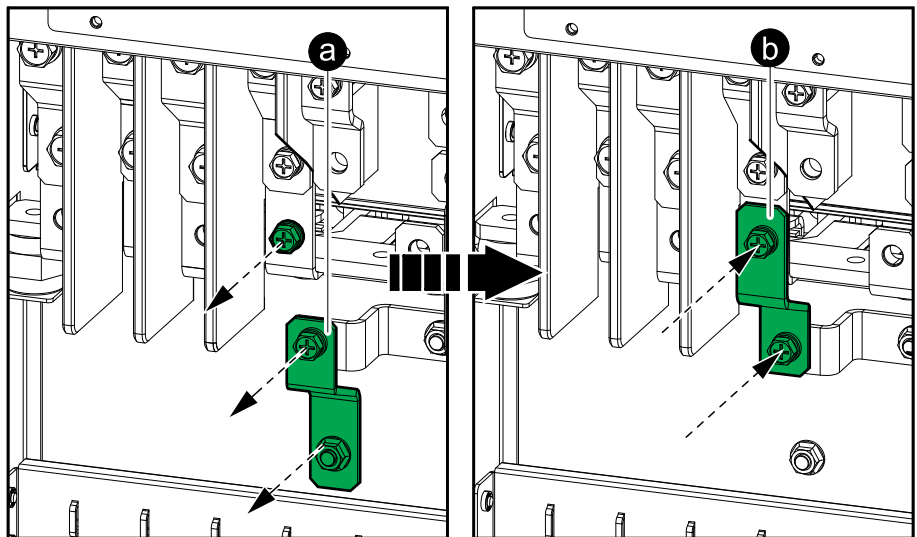
NOTE: This procedure is only applicable to TNC earthing systems.

1. Rotate the busbar from the original position (a) to the position (b) to create a connection between the PE busbar and the neutral busbar.

60-80 kVA 400 V UPS



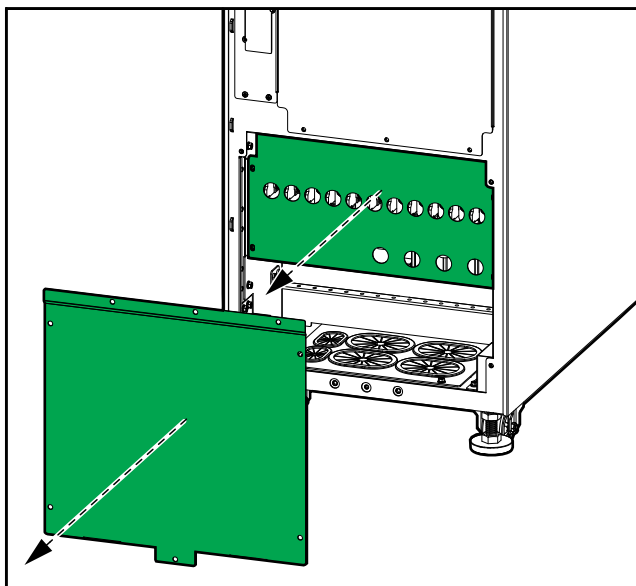
100 kVA 400 V/50 kVA 208 V UPS



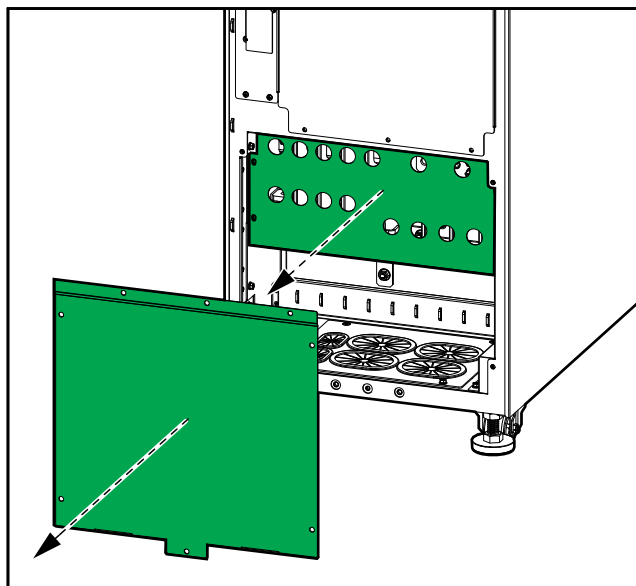
Connect the Power Cables

1. Ensure that all breakers are in the OFF (open) position.
2. Remove the two indicated plates from the bottom of the UPS.

Rear View 60-80 kVA 400 V UPS

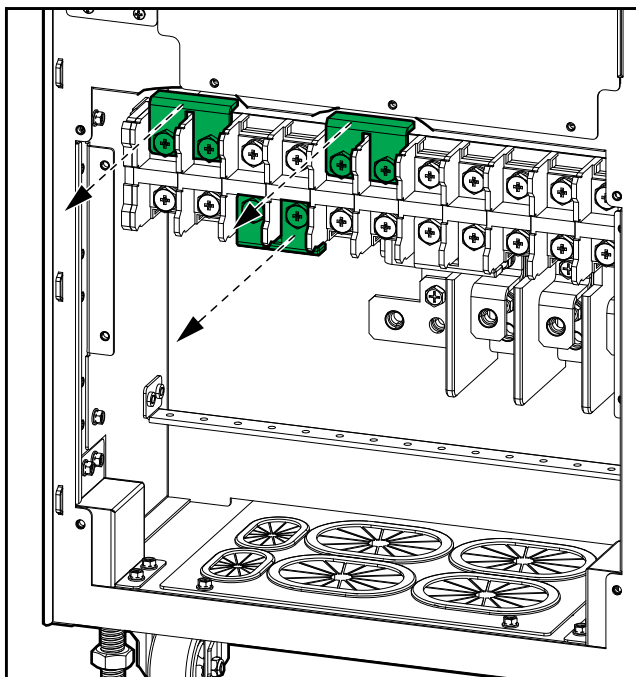


Rear View 100 kVA 400 V/50 kVA 208 V UPS

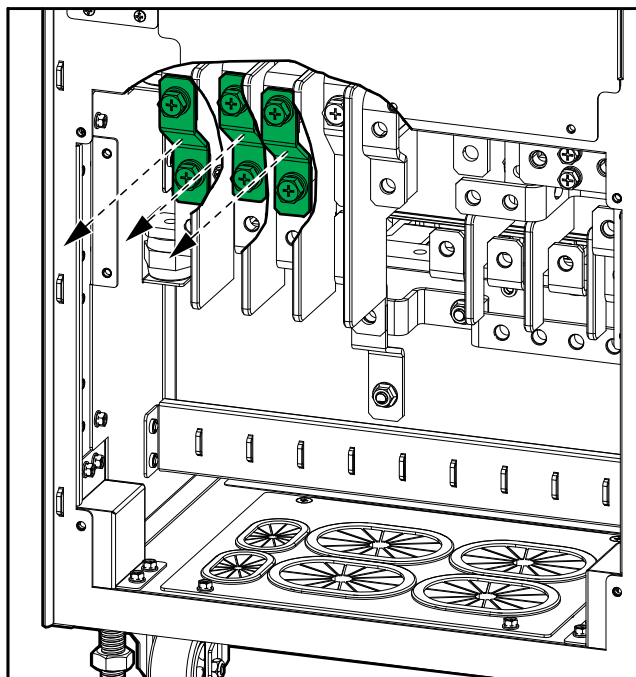


3. In dual mains systems, remove the three single mains brackets.

Rear View 60-80 kVA 400 V UPS

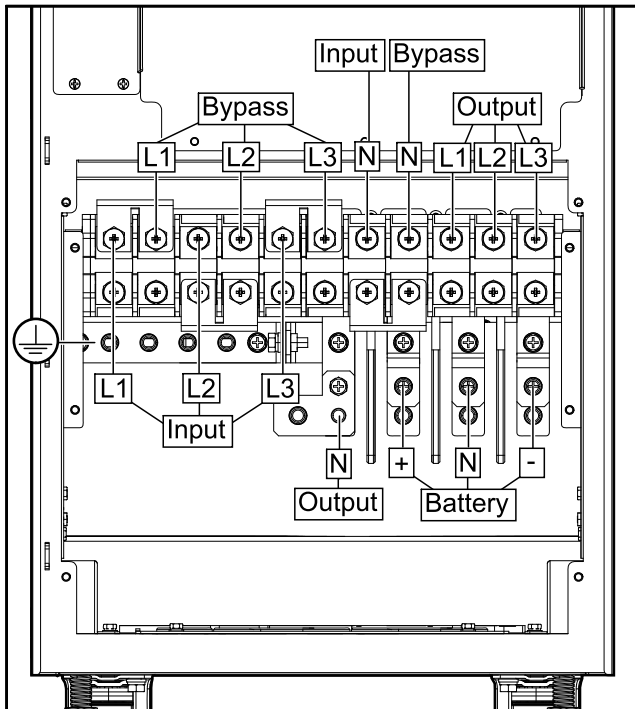
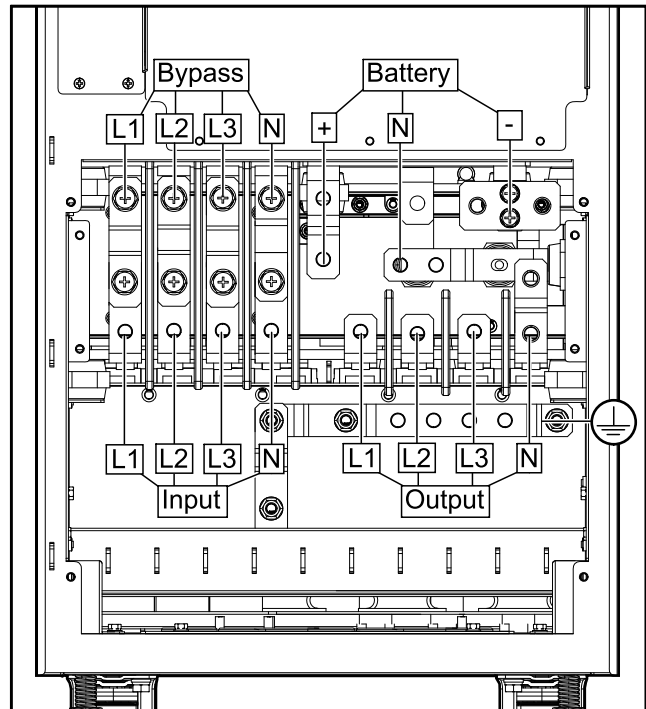


Rear View 100 kVA 400 V/50 kVA 208 V UPS



4. Route the power cables through the bottom of the UPS.

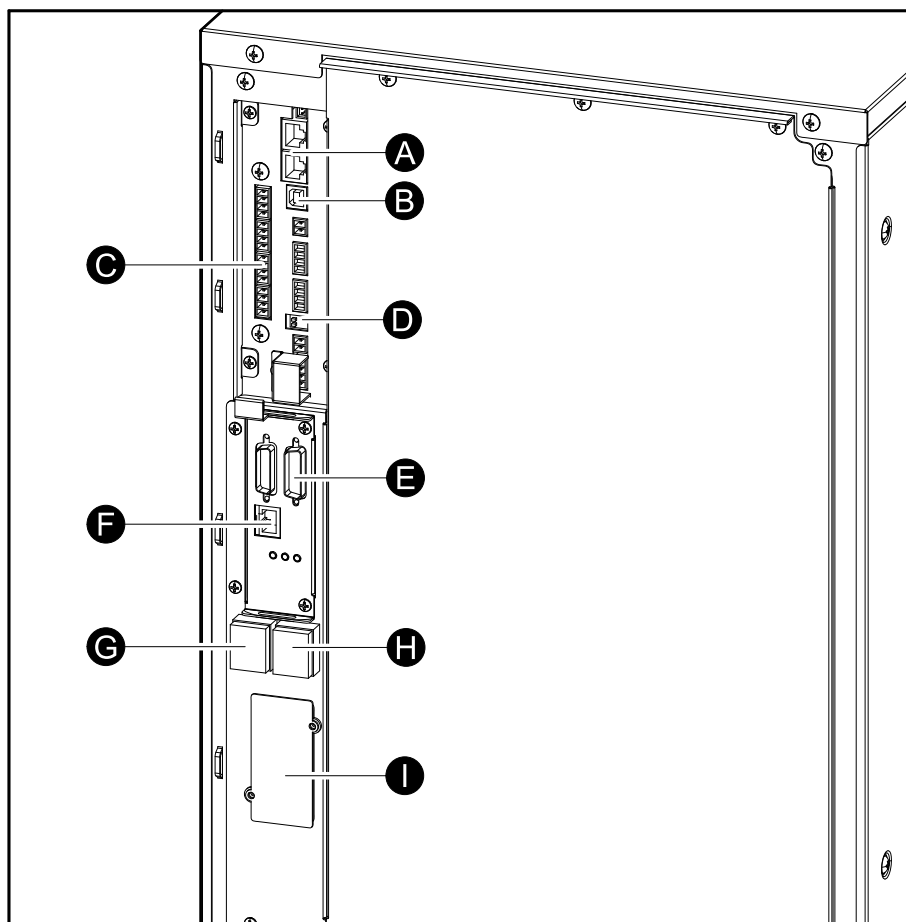
5. Connect the PE cable to the PE terminal.

Rear View 60-80 kVA 400 V UPS**Rear View 100 kVA 400 V/50 kVA 208 V UPS**

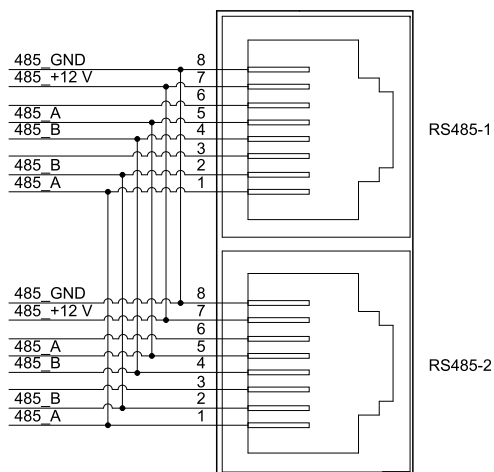
6. Connect the input, output, and bypass (if applicable) cables.
7. Connect the battery cables.
8. Fasten the cables to the cable relief in the bottom of the UPS.
9. Reinstall the two plates in the bottom of the UPS.

Communication Interfaces

Rear View of the UPS



A. RS485



- B. USB
- C. Dry contacts
- D. CAN_R: CAN termination resistor
- E. Parallel ports
- F. Load bus synchronization port
- G. EPO
- H. Cold start button (optional)
- I. Network management card (NMC)

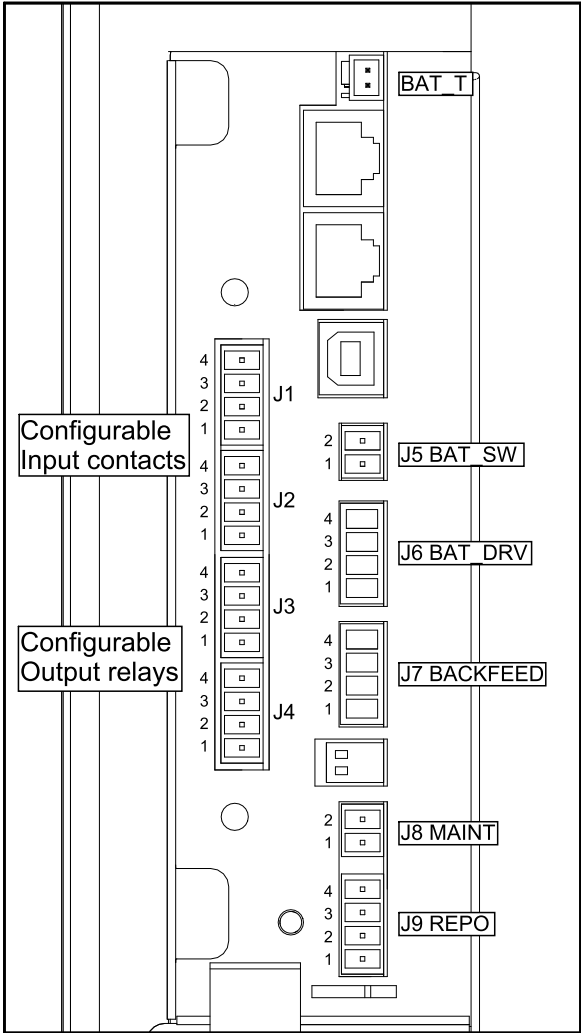
Input Contacts and Output Relays

NOTICE

RISK OF EQUIPMENT DAMAGE

The battery breaker contact drive J6–1 and J6–2 can provide a maximum of +24 VDC 400 mA to the undervoltage release coil or shunt trip release coil. If this value is exceeded it can damage the UPS.

Failure to follow these instructions can result in equipment damage.



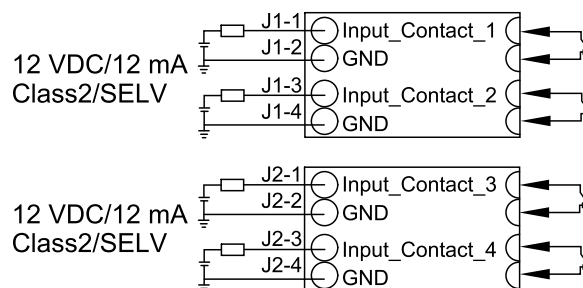
Terminal	Function	
BAT_T–1	Input contact for battery temperature sensor	
BAT_T–2	Signal ground	
J5–1	Auxiliary contact for battery breaker	<div>12 VDC/12 mA Class2/SELV</div>
J5–2	Signal ground	
J6–1	Normally closed output contact for battery breaker trip	<div>24 VDC/400 mA Class2/SELV</div>
J6–2	Normally open output contact for battery breaker trip	
J6–4	Signal ground	

Terminal	Function	
J7-1	Backfeed 1 output relay pin 1 (normally closed (NC) as default)	
J7-2	Backfeed 1 output relay pin 2 (normally closed (NC) as default)	
J7-3	Backfeed 2 output relay pin 1 (normally closed (NC) as default)	
J7-4	Backfeed 2 output relay pin 2 (normally closed (NC) as default)	
J8-1	Auxiliary contact for external maintenance bypass breaker	
J8-2	Signal ground	
J9-1	Normally open EPO contact	<p>NO configuration</p> <p>NC configuration</p>
J9-2	Signal ground	
J9-3	Normally closed EPO contact	
J9-4	Signal ground	

Configurable Input Contacts

The four configurable input contacts can be configured from the display with the following functions:

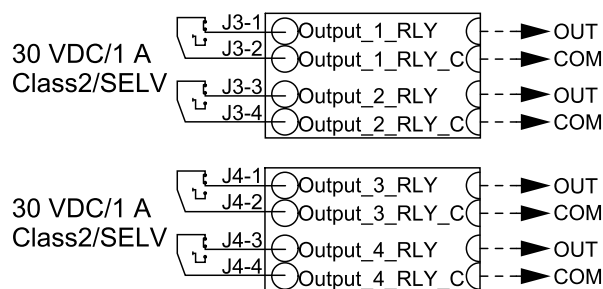
- Disable
- INV ON
- INV OFF
- Battery alarm
- Genset enable
- Custom alarm 3
- Custom alarm 4
- Disable ECO



Configurable Output Relays

The four configurable output contacts can be configured from the display with the following functions:

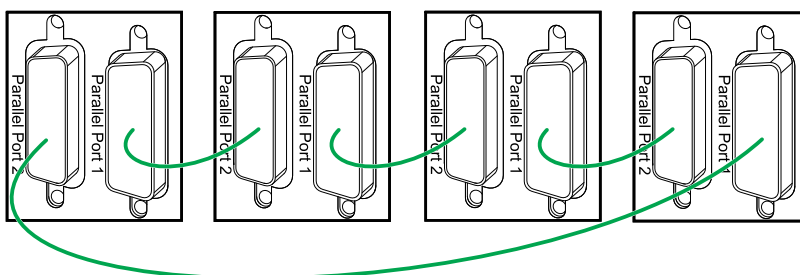
- Disable
- Common alarm
- Normal operation
- Battery operation
- Static bypass operation
- Output overload
- Fan inoperable
- Battery alarm
- Battery disconnected
- Battery voltage low
- Input out of tolerance
- Bypass out of tolerance
- EPO activated
- Maintenance mode
- Parallel lost



Connect the Signal Cables in Parallel Systems

1. Connect the optional parallel cables between all the UPSs of the parallel system.

NOTE: See [Communication Interfaces](#), page 39 for location of parallel ports.



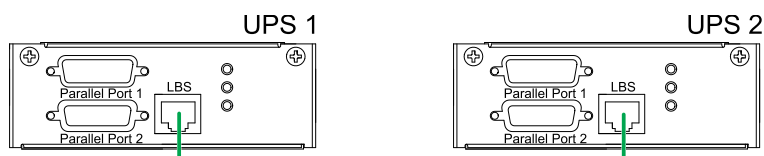
2. Verify the setting of the CAN_R (for location of CAN_R see [Communication Interfaces](#), page 39).
 - For parallel systems with ≤ 4 parallel UPSs, CAN_R of all UPSs must be in ON position.
 - For parallel systems with ≥ 5 parallel UPSs, CAN_R of all UPSs must be in OFF position.

Connect Synchronization Cables Between Two UPS Systems (Option)

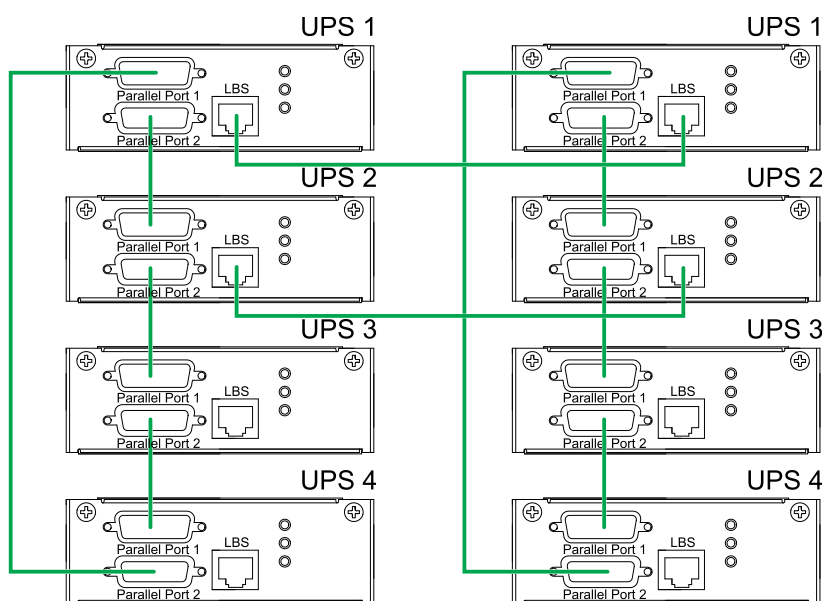
The maximum configuration is two parallel systems of four UPSs.

1. Connect the optional synchronization cables between the UPS systems according to the concept below.

Synchronization Cable Connection for Two Single UPSs



Synchronization Cable Connection for Two Parallel Systems



Backfeed Protection

⚠ 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) 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.

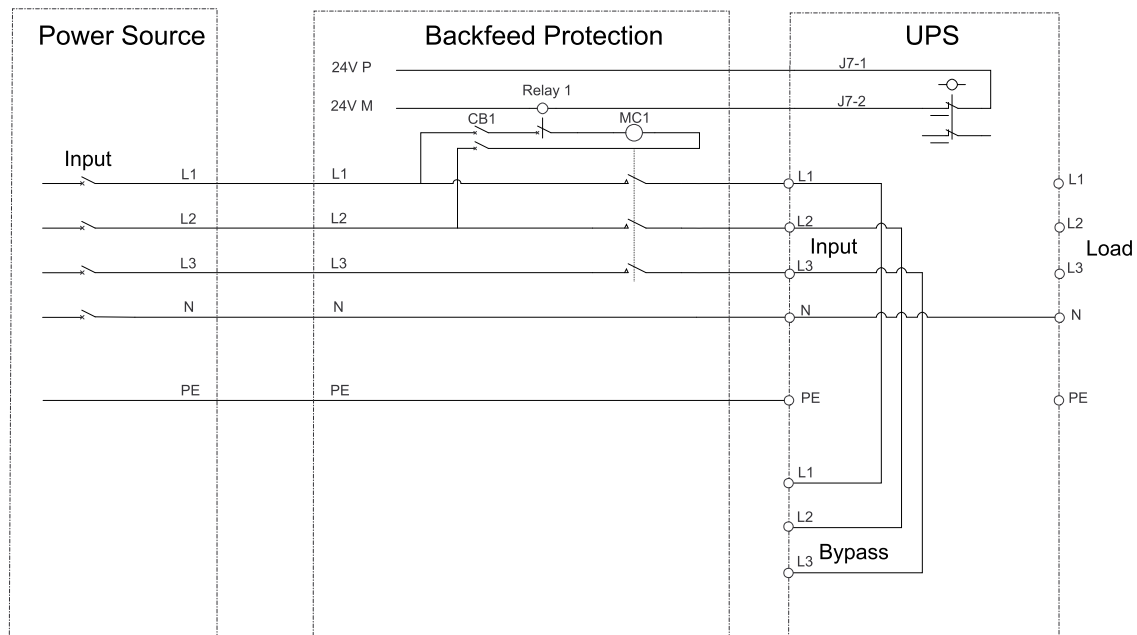
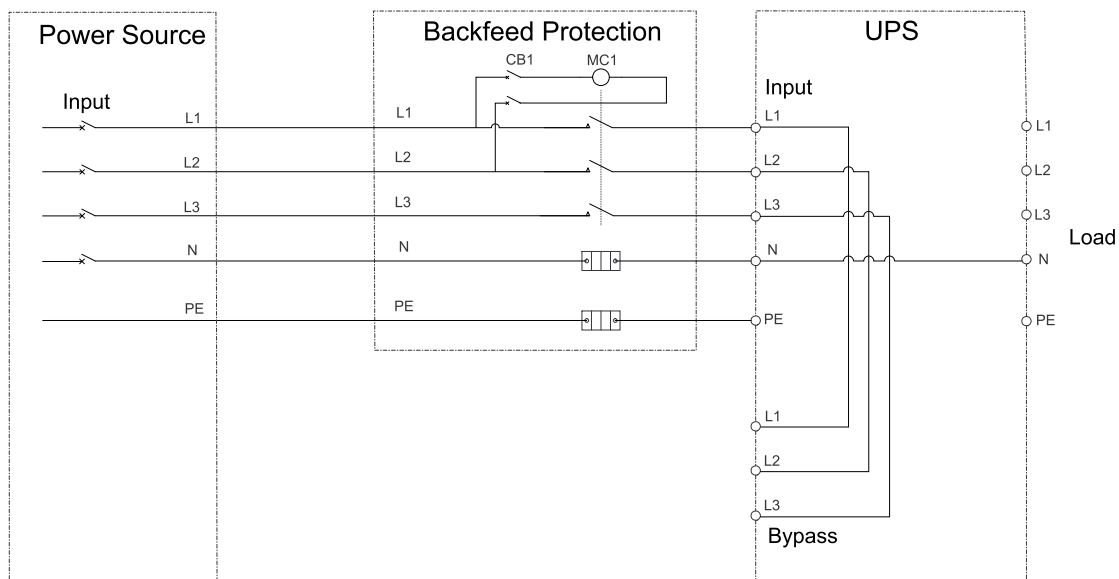
Failure to follow these instructions will result in death or serious injury.

An additional external isolation device must be installed in the UPS system. A contactor can be used for this purpose. In the shown examples, the isolation device is a contactor (marked with a **MC1** for single mains systems and marked with a **MC1** and **MC2** for dual mains systems).

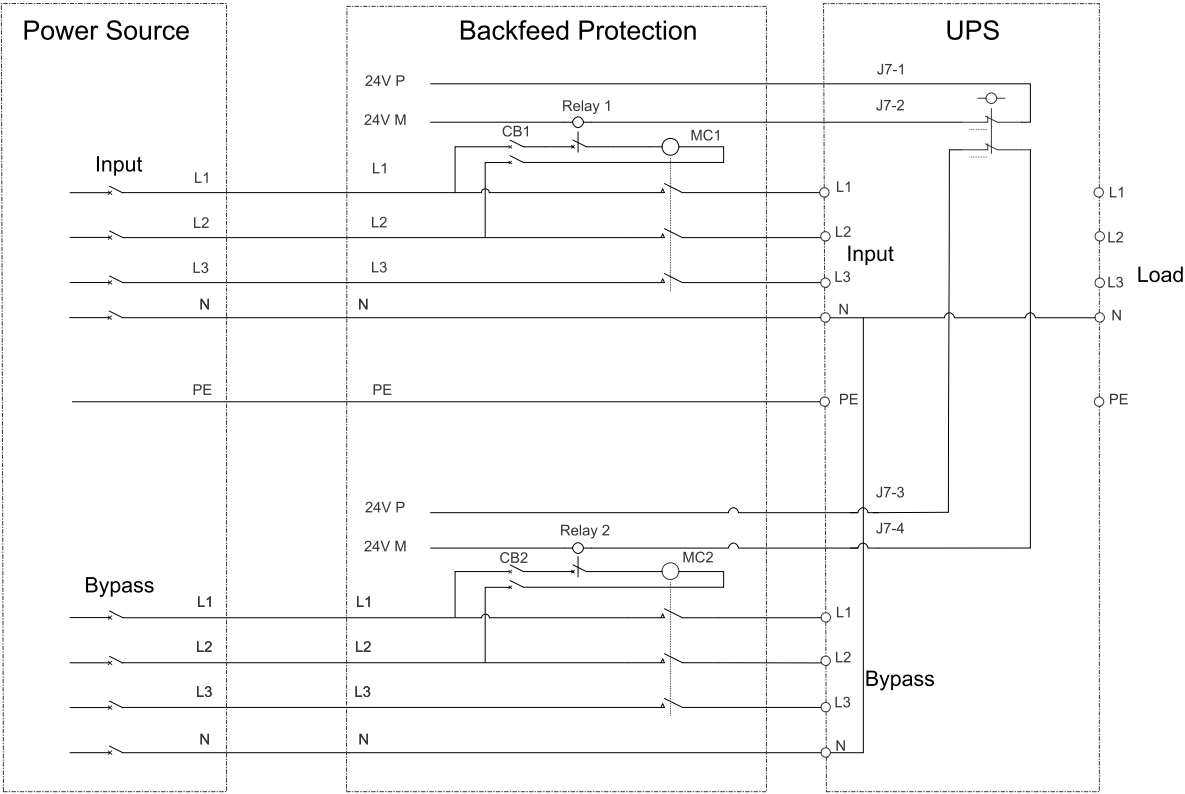
The isolation device must be able to withstand the electrical characteristics as described in [Specifications](#), page 16.

NOTE: The 24 V source should be generated from the switchgear input source in single mains configurations and from both the switchgear input and bypass source in dual mains configurations.

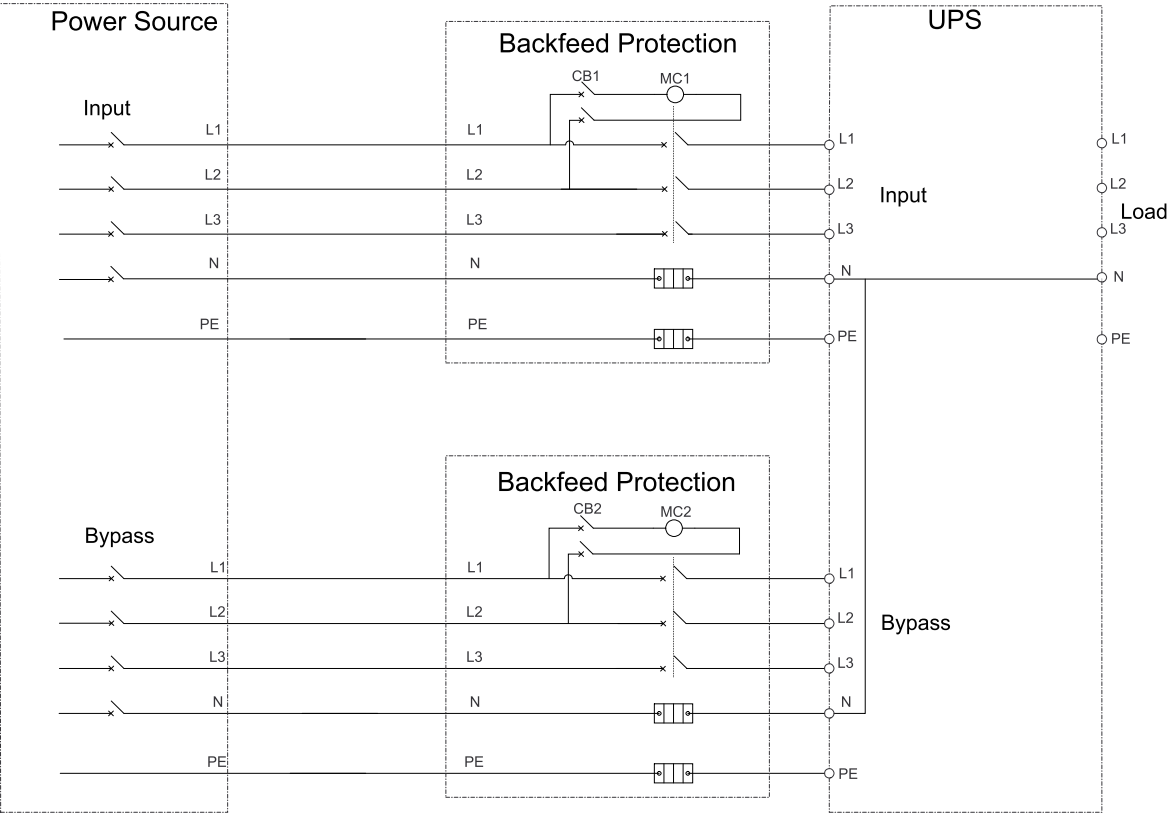
NOTE: The backfeed box in the diagrams is a customized device – please contact Schneider Electric for details.

Single Mains UPS and External Isolation Device**Single Mains UPS with Backfeed Box**

Dual Mains UPS and External Isolation Device



Dual Mains UPS with Backfeed Box



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