

Galaxy VS

UPS with Up to 5 Internal Battery Strings

Installation

20-50 kW with N+1 Power Module 400/480 V

60-100 kW 400/480 V

10-25 kW with N+1 Power Module 208 V

30-50 kW 208 V

Latest updates are available on the Schneider Electric website
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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, section 3.102).

FCC Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Electromagnetic Compatibility

NOTICE

RISK OF ELECTROMAGNETIC DISTURBANCE

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

Failure to follow these instructions can result in equipment damage.

Safety Precautions

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read all instructions in the installation manual before installing or working on this UPS system.

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

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install the UPS system until all construction work has been completed and the installation room has been cleaned. If additional construction work is needed in the installation room after the UPS has been installed, turn off the UPS and cover the UPS with the protective packaging bag the UPS was delivered in.

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 UPS ventilation openings when the UPS system is in operation.

Failure to follow these instructions can result in equipment damage.

NOTICE**RISK OF EQUIPMENT DAMAGE**

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

Failure to follow these instructions can result in equipment damage.

Electrical Safety

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the 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 touch current/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.

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

- Always perform correct Lockout/Tagout before working on the UPS.
- A UPS with autostart enabled will automatically restart when the mains supply returns.
- If autostart is enabled on the UPS, a label must be added on the UPS to warn about this functionality.

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

Add the label below on the UPS if autostart has been enabled:

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

Autostart is enabled. The UPS will automatically restart when the mains supply returns.

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

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

This product can cause a DC current in the PE conductor. If 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 will result in death or serious injury.

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.

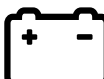
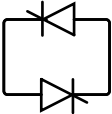
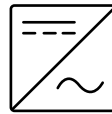
Failure to follow these instructions can result in injury or equipment damage.

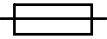
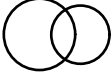
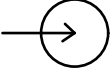
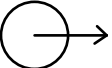
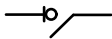
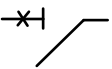
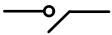
ENERGY STAR Qualification



Select models are ENERGY STAR® qualified.
For more information on your specific model go to www.se.com.

Symbols Used

	Earthing/ground symbol.
	Protective earth (PE)/equipment grounding conductor (EGC) symbol.
	Direct current (DC) symbol.
	Alternating current (AC) symbol.
	Positive polarity symbol. It is used to identify the positive terminal(s) of equipment which is used with, or generates direct current.
	Negative polarity symbol. It is used to identify the negative terminal(s) of equipment which is used with, or generates direct current.
	Battery symbol.
	Static switch symbol. It is used to indicate switches that are designed to connect or disconnect the load to or from the supply respectively without the existence of moving parts.
	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.
	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.

	Fuse symbol. It is used to identify fuse boxes or their locations.
	Transformer symbol.
	Input symbol. It is used to identify an input terminal when it is necessary to distinguish between inputs and outputs.
	Output symbol. It is used to identify an output terminal when it is necessary to distinguish between inputs and outputs.
	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.
	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.
	Disconnection device 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.
	Neutral symbol. It is used to identify the neutral conductors or their locations.
	Phase conductor symbol. It is used to identify the phase conductors or their locations.

Specifications

Specifications for 400 V Systems

Input Specifications 400 V

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE (single mains) ¹ 3-wire (L1, L2, L3, PE) WYE (dual mains) ^{2 3}			
Input voltage range (V)	380 V: 331-437 400 V: 340-460 415 V: 353-477			
Frequency range (Hz)	40-70			
Nominal input current (A)	32/30/29	47/45/43	63/60/58	79/75/72
Maximum input current (A)	39/37/36	58/55/53	77/73/70	93/92/88
Input current limitation (A)	39/37/36	60/57/55	79/75/73	93/93/91
Input power factor	0.99 at 100% load			
Total harmonic distortion (THDI)	<6% at full linear load (symmetrical)			
Minimum short circuit rating	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.			
Maximum short circuit rating	65 kA RMS			
Protection	Built-in backfeed protection and fuses			
Ramp-in	Programmable and adaptive 1-40 seconds			

UPS rating	60 kW	80 kW	100 kW
Voltage (V)	380/400/415	380/400/415	400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE (single mains) ¹ 3-wire (L1, L2, L3, PE) WYE (dual mains) ^{2 3}		
Input voltage range (V)	380 V: 331-437 400 V: 340-460 415 V: 353-477		
Frequency range (Hz)	40-70		
Nominal input current (A)	95/90/87	126/120/116	150/144
Maximum input current (A)	116/110/106	154/146/141	183/176
Input current limitation (A)	119/113/109	158/148/145	184/180
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%		
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)		

1. TN and TT power distribution systems are supported. Corner (line) grounding is not permitted.
2. TN and TT power distribution systems are supported. Corner (line) grounding is not permitted.
3. **Only for dual mains system with upstream 4-pole breakers:** Install an N connection with the input cables (L1, L2, L3, N, PE). Refer to earthing schematics for TN-S dual mains 4-pole circuit breaker.

UPS rating	60 kW	80 kW	100 kW
Voltage (V)	380/400/415	380/400/415	400/415
Minimum short circuit rating	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.		
Maximum short circuit rating	65 kA RMS		
Protection	Built-in backfeed protection and fuses		
Ramp-in	Programmable and adaptive 1-40 seconds		

Bypass Specifications 400 V

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE			
Bypass voltage range (V)	380 V: 342-418 400 V: 360-440 415 V: 374-457			
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)			
Nominal bypass current (A)	32/29/28	47/45/43	62/59/57	78/74/71
Nominal neutral current (A)	53/50/48	79/75/72	105/100/96	132/125/120
Minimum short circuit rating	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.			
Maximum short circuit rating ⁴	65 kA RMS			
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s			

UPS rating	60 kW	80 kW	100 kW
Voltage (V)	380/400/415	380/400/415	400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE		
Bypass voltage range (V)	380 V: 342-418 400 V: 360-440 415 V: 374-457		
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)		
Nominal bypass current (A)	94/88/85	125/119/114	148/143
Nominal neutral current (A)	158/150/144	210/200/193	250/241
Minimum short circuit rating	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.		
Maximum short circuit rating ⁴	65 kA RMS		
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s		

4. Conditioned by the internal fuse rated 400 A, prearcing 33 kA²s.

Output Specifications 400 V

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE)			
Output voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$			
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 110% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)			
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds			
Output power factor	1			
Nominal output current (A)	30/29/28	46/43/42	61/58/56	76/72/70
Minimum short circuit rating ⁵	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.			
Maximum short circuit rating ⁶	65 kA RMS			
Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 37.			
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm 0.1\%$ free-running			
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6			
Output performance classification (according to IEC 62040-3:2021)	VFI-SS-11			
Total harmonic distortion (THDU)	<1% for linear load <3% for non-linear load			
Load crest factor	2.5			
Load power factor	From 0.7 leading to 0.7 lagging without any derating			

UPS rating	60 kW	80 kW	100 kW
Voltage (V)	380/400/415	380/400/415	400/415
Connections	4-wire (L1, L2, L3, N, PE)		
Output voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$		
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 110% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)		
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds		
Output power factor	1		
Nominal output current (A)	91/87/83	122/115/111	144/139
Minimum short circuit rating ⁵	Dependent on upstream protection. See section for Recommended Upstream Protection for 400 V for details.		

5. Minimum short circuit rating for output takes backfeeding energy through the bypass of parallel UPSs into consideration.

6. Maximum short circuit rating for output takes backfeeding energy through the bypass of parallel UPSs into consideration.

UPS rating	60 kW	80 kW	100 kW
Voltage (V)	380/400/415	380/400/415	400/415
Maximum short circuit rating ⁷	65 kA RMS		
Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 37.		
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm$ 0.1% free-running		
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6		
Output performance classification (according to IEC 62040-3:2021)	VFI-SS-11		
Total harmonic distortion (THDU)	<1% for linear load <3% for non-linear load		
Load crest factor	2.5		
Load power factor	From 0.7 leading to 0.7 lagging without any derating		

7. Maximum short circuit rating for output takes backfeeding energy through the bypass of parallel UPSs into consideration.

Battery Specifications 400 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Protection of the energy storage device: An overcurrent protective device must be located in close proximity to the energy storage device.

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

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module	60 kW	80 kW	100 kW
Charging power in % of output power at 0-40% load	80%						
Charging power in % of output power at 100% load	20%						
Maximum charging power (at 0-40% load) (kW)	16	24	32	40	48	64	80
Maximum charging power (at 100% load) (kW)	4	6	8	10	12	16	20
Nominal battery voltage (VDC)	480						
Nominal float voltage (VDC)	545						
Maximum boost voltage (VDC)	572						
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C						
End of discharge voltage (full load) (VDC)	384						
Battery current at full load and nominal battery voltage (A)	43	65	87	109	130	174	217
Battery current at full load and minimum battery voltage (A)	54	81	109	136	163	217	271
Ripple current	< 5% C20 (5 minute runtime)						
Battery test	Manual/automatic (selectable)						
Maximum short circuit rating	10 kA						

Surge Protection Device (SPD)

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

This UPS is OVCII (Over Voltage Category Class II) compliant. This UPS must only be installed in an OVCII compliant environment.

- If the UPS is installed in an environment with an OVC rating higher than II, an SPD (surge protection device) must be installed upstream of the UPS to reduce the overvoltage category to OVCII.
- The SPD must include a status indicator to show the user if the SPD is operational or is no longer functioning according to design. The status indicator may be visual and/or audible and/or may have remote signalling and/or output contact capability in accordance with IEC 62040-1.

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

Surge Protection Device Requirements

Select a surge protection device that complies with the following requirements:

Class	Type 2
Rated voltage (U_r)	230/400 V, 277/480 V
Voltage protection level (U_p)	< 2.5 kV
Short circuit rating (I_{scrr}) ⁸	According to installation prospective short circuit level
Earthing system ⁹	TN-S, TT, IT, TN-C
Poles	3P/4P depending on earthing configuration
Standards	IEC 61643-11 / UL 1449
Monitoring	Yes

8. Lower short circuit rating can be achieved with fuse protection.

9. Corner grounding not permitted.

Recommended Cable Sizes 400 V

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 150 mm².

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

The maximum number of cable connections per busbar: Two on input/output/bypass busbars; Four on DC busbars; Six on N/PE busbars.

NOTE: Overcurrent protection is to be provided by others.

Cable sizes in this manual are based on table B.52.3 and 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 cable size is based on table 54.2 of IEC 60364-4-54.

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

NOTE: Recommended cable sizes and maximum allowable cable size may vary for the auxiliary products. Not all auxiliary products support aluminum cables. Refer to the installation manual provided with the auxiliary product.

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

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.

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module	60 kW	80 kW	100 kW
Input phases (mm ²)	6	10	16	25	35	50	70
Input PE (mm ²)	6	10	16	16	16	25	35
Bypass/output phases (mm ²)	6	6	10	16	25	35	50
Bypass PE/output PE (mm ²)	6	6	10	16	16	16	25
Neutral (mm ²)	10	16	25	35	50	70	95
DC+/DC- (mm ²)	10	16	25	35	50	70	95
DC PE (mm ²)	10	16	16	16	25	35	50

Recommended Upstream Protection for 400 V

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- For parallel systems, instantaneous override (li) values must not be set higher than 1250 A. Place the label 885-92556 adjacent to the upstream circuit breaker to inform about the hazard.
- In parallel systems with three or more UPSs, a circuit breaker must be installed on the output of each UPS. The unit output breaker (UOB) instantaneous override (li) values must not be set higher than 1250 A.

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

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.

NOTICE

RISK OF UNINTENTIONAL DEVICE OPERATION

If a residual current-operated protective device (RCD-B) is used upstream as ground fault protection, then the RCD-B shall be sized to not trip on the leakage current of this product, which can be up to 67 mA.

Failure to follow these instructions can result in equipment damage.

Upstream Protection for IEC and Minimum Prospective Phase-To-Earth Short Circuit at the UPS Input/Bypass Terminals

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The upstream overcurrent protective device (and its settings) must be sized to ensure a disconnecting time within 0.2 seconds for a minimum prospective phase-to-earth short circuit current calculated or measured at the input/bypass terminals of the UPS.

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

Compliance is assured with the recommended breaker (and its settings) from the table below.

Recommended Upstream Protection for 400 V IEC

$I_{k_{Ph-PE}}$ is the minimum prospective phase-to-earth short circuit current required at the input/bypass terminals of the UPS. The $I_{k_{Ph-PE}}$ in the table is based on the recommended protective device.

UPS rating	20 kW with N+1 power module		30 kW with N+1 power module		40 kW with N+1 power module		50 kW with N+1 power module	
	Input	Bypass	Input	Bypass	Input	Bypass	Input	Bypass
I_{kPh-PE} (kA)	0.6	0.5	0.6	0.5	0.7	0.6	0.8	0.7
Breaker type	NSX100H TM40D (C10H3T-M040)	NSX100H TM32D (C10H3T-M032)	NSX100H TM63D (C10H3T-M063)	NSX100H TM50D (C10H3T-M050)	NSX100H TM80D (C10H3T-M080)	NSX100H TM63D (C10H3T-M063)	NSX100H TM100D (C10H3T-M100)	NSX100H TM80D (C10H3T-M080)
In setting	40	32	63	50	80	63	100	80
Ir setting	40	32	63	50	80	63	100	80
Im setting	500 (fixed)	400 (fixed)	500 (fixed)	500 (fixed)	640 (fixed)	500 (fixed)	800 (fixed)	640 (fixed)

UPS rating	60 kW		80 kW		100 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
I_{kPh-PE} (kA)	1.5	0.8	1.6	1.5	2	1.6
Breaker type	NSX160H TM125D (C16H3TM125)	NSX100H TM100D (C10H3TM100)	NSX160H TM160D (C16H3TM160)	NSX160H TM125D (C16H3TM125)	NSX250H TM200D (C25H3TM200)	NSX160H TM160D (C16H3TM160)
In setting	125	100	160	125	200	160
Ir setting	125	100	160	125	200	160
Im setting	1250 (fixed)	800 (fixed)	1250 (fixed)	1250 (fixed)	$\leq 6 \times I_n$	1250 (fixed)

Recommended Bolt and Lug Sizes for IEC

Cable size mm ²	Bolt size	Cable lug type
6	M8 x 25 mm	TLK6-8
10	M8 x 25 mm	TLK10-8
16	M8 x 25 mm	TLK16-8
25	M8 x 25 mm	TLK25-8
35	M8 x 25 mm	TLK35-8
50	M8 x 25 mm	TLK50-8
70	M8 x 25 mm	TLK70-8
95	M8 x 25 mm	TLK95-8
120	M8 x 25 mm	TLK120-8
150	M8 x 25 mm	TLK150-8

Leakage Current

380/400/415 V UPS system 4-wire installation at 100% load

UPS rating	Leakage current
20-50 kW with N+1 power module	67 mA
60-100 kW	67 mA

Specifications for 480 V Systems

The supply for input and bypass must be solid-grounded WYE transformers. Delta input supply for either input or bypass is not permitted.

The UPS system must be installed as a separately derived system. Leakage currents will occur in the bonding jumper and the technical/system earth.

Input Specifications 480 V

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Connections	3-wire (L1, L2, L3, G) WYE or 4-wire (L1, L2, L3, N, G) WYE (single mains) 3-wire (L1, L2, L3, G) WYE (dual mains) ¹⁰			
Input voltage range (V)	408-552			
Frequency range (Hz)	40-70			
Nominal input current (A)	25	37	50	62
Maximum input current (A)	31	46	61	75
Input current limitation (A)	31	48	63	77
Input power factor	0.99 at 100% load			
Total harmonic distortion (THDI)	<6% at full linear load (symmetrical)			
Maximum short circuit rating	65 kA RMS			
Protection	Built-in backfeed protection and fuses			
Ramp-in	Programmable and adaptive 1-40 seconds			

UPS rating	60 kW	80 kW	100 kW
Connections	3-wire (L1, L2, L3, G) WYE or 4-wire (L1, L2, L3, N, G) WYE (single mains) 3-wire (L1, L2, L3, G) WYE (dual mains) ¹⁰		
Input voltage range (V)	408-552		
Frequency range (Hz)	40-70		
Nominal input current (A)	74	99	124
Maximum input current (A)	91	121	152
Input current limitation (A)	95	126	154
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%		
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)		
Maximum short circuit rating	65 kA RMS		

¹⁰. TN and TT power distribution systems are supported. Corner (line) grounding is not permitted.

UPS rating	60 kW	80 kW	100 kW
Protection	Built-in backfeed protection and fuses		
Ramp-in	Programmable and adaptive 1-40 seconds		

Bypass Specifications 480 V

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Connections	3-wire (L1, L2, L3, G) WYE or 4-wire (L1, L2, L3, N, G) WYE ¹¹			
Bypass voltage range (V)	432-528			
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)			
Nominal bypass current (A)	25	37	50	62
Nominal neutral current (A)	42	62	83	104
Maximum short circuit rating ¹²	65 kA RMS			
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s			

UPS rating	60 kW	80 kW	100 kW
Connections	3-wire (L1, L2, L3, G) WYE or 4-wire (L1, L2, L3, N, G) WYE ¹¹		
Bypass voltage range (V)	432-528		
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)		
Nominal bypass current (A)	74	99	123
Nominal neutral current (A)	125	166	208
Maximum short circuit rating ¹²	65 kA RMS		
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s		

11. TN and TT power distribution systems are supported. Corner (line) grounding is not permitted.

12. Conditioned by the internal fuse rated 400 A, prearcing 33 kA²s.

Output Specifications 480 V

NOTE: The number of output connections must match the number of input wires in a single mains system or bypass wires in a dual mains system.

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module
Connections	3-wire (L1, L2, L3, G, GEC ¹³) or 4-wire (L1, L2, L3, N, G)			
Output voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$			
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 125% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)			
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds			
Output power factor	1			
Nominal output current (A)	24	36	48	60
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm 0.1\%$ free-running			
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6			
Total harmonic distortion (THDU)	<1% for linear load <3% for non-linear load			
Load crest factor	2.5			
Load power factor	From 0.7 leading to 0.7 lagging without any derating			

UPS rating	60 kW	80 kW	100 kW
Connections	3-wire (L1, L2, L3, G, GEC ¹³) or 4-wire (L1, L2, L3, N, G)		
Output voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$		
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 125% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)		
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds		
Output power factor	1		
Nominal output current (A)	72	96	120
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm 0.1\%$ free-running		
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6		
Total harmonic distortion (THDU)	<1% for linear load <3% for non-linear load		
Load crest factor	2.5		
Load power factor	From 0.7 leading to 0.7 lagging without any derating		

13. Per NEC 250.30.

Battery Specifications 480 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Protection of the energy storage device: An overcurrent protective device must be located in close proximity to the energy storage device.

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

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module	60 kW	80 kW	100 kW
Charging power in % of output power at 0-40% load	80%						
Charging power in % of output power at 100% load	20%						
Maximum charging power (at 0-40% load) (kW)	16	24	32	40	48	64	80
Maximum charging power (at 100% load) (kW)	4	6	8	10	12	16	20
Nominal battery voltage (VDC)	480						
Nominal float voltage (VDC)	545						
Maximum boost voltage (VDC)	572						
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C						
End of discharge voltage (full load) (VDC)	384						
Battery current at full load and nominal battery voltage (A)	43	65	87	109	130	174	217
Battery current at full load and minimum battery voltage (A)	54	81	109	136	163	217	271
Ripple current	< 5% C20 (5 minute runtime)						
Battery test	Manual/automatic (selectable)						
Maximum short circuit rating	10 kA						

Recommended Cable Sizes 480 V

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 300 kcmil.

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

The maximum number of cable connections per busbar: Two on input/output/bypass busbars; Four on DC busbars; Six on N/G busbars.

NOTE: Overcurrent protection is to be provided by others.

Cable sizes in this manual are based on Table 310.15 (B)(16) of the National Electrical Code (NEC) with the following assertions:

- 90 °C (194 °F) conductors (75 °C (167 °F) termination)
- An ambient temperature of 30 °C (86 °F)
- Use of copper conductors

If the ambient temperature is greater than 30 °C (86 °F), larger conductors are to be selected in accordance with the correction factors of the NEC.

Equipment grounding conductors (EGC) are sized in accordance with NEC Article 250.122 and Table 250.122.

NOTE: Recommended cable sizes and maximum allowable cable size may vary for the auxiliary products. Not all auxiliary products support aluminum cables. Refer to the installation manual provided with the auxiliary product.

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

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.

UPS rating	20 kW with N+1 power module	30 kW with N+1 power module	40 kW with N+1 power module	50 kW with N+1 power module	60 kW	80 kW	100 kW
Input phases (AWG/kcmil)	8	6	4	3	1	2/0	3/0
Input EGC (AWG/kcmil)	10	8	8	6	6	6	4
Bypass/output phases (AWG/kcmil)	10	8	6	4	3	1	2/0
Bypass EGC/output EGC (AWG/kcmil)	10	10	8	8	8	6	6
Neutral (AWG/kcmil)	6	4	2	1/0	2/0	4/0	2 x 1/0
DC+/DC-(AWG/kcmil)	6	4	2	1/0	2/0	4/0	2 x 1/0
DC EGC (AWG/kcmil)	8	6	6	6	6	4	4

NOTE: Cable sizes are based on 80% rated circuit breakers for UIB, UOB, MBB, SSIB, and 100% rated circuit breaker for battery breaker(s).

Recommended Upstream Protection 480 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- For parallel systems, instantaneous override (li) values must not be set higher than 1250 A. Place the label 885-92556 adjacent to the upstream circuit breaker to inform about the hazard.
- In parallel systems with three or more UPSs, a circuit breaker must be installed on the output of each UPS. The unit output breaker (UOB) instantaneous override (li) values must not be set higher than 1250 A.

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

CAUTION

HAZARD OF FIRE

- Connect only to a circuit with the below specifications.
- Connect to a circuit provided with a 250 A branch circuit overcurrent protection maximum in accordance with the National Electrical Code, ANSI/NFPA70, and the Canadian Electrical Code, Part I, C22.1.

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

NOTE: Overcurrent protection is to be provided by others and marked with its function.

UPS rating	20 kW with N+1 power module		30 kW with N+1 power module		40 kW with N+1 power module		50 kW with N+1 power module	
	Input	Bypass	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36100U31X							
Ir setting	40	35	60	50	80	70	100	80
Tr at 6 Ir setting	0.5							
li (x In) setting	1.5							

UPS rating	60 kW		80 kW		100 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36150U31X	HJF36100U31X	JJF36250U31X	HJF36150U31X	JJF36250U31X	
Ir setting	125	100	175	125	200	175
Tr at 6 Ir setting	0.5					
li (x In) setting	1.5					

Recommended Bolt and Lug Sizes for UL

NOTICE

RISK OF EQUIPMENT DAMAGE

Use only UL approved compression cable lugs.

Failure to follow these instructions can result in equipment damage.

Copper – One Hole Cable Lugs

Cable size	Bolt size	Cable lug type	Crimping tool	Die
10 AWG	M8 x 25 mm	LCA10-56-L	NA	NA
8 AWG	M8 x 25 mm	LCA8-56-L	CT-720	CD-720-1 Red P21
6 AWG	M8 x 25 mm	LCA6-56-L	CT-720	CD-720-1 Blue P24
4 AWG	M8 x 25 mm	LCA4-56-L	CT-720	CD-720-1 Gray P29
3 AWG	M8 x 25 mm	LCA4-56-L	CT-720	CD-720-1 Gray P29
2 AWG	M8 x 25 mm	LCA2-56-Q	CT-720	CD-720-1 Brown P33
1 AWG	M8 x 25 mm	LCA1-56-E	CT-720	CD-720-2 Green P37
1/0 AWG	M8 x 25 mm	LCA1/0-56-X	CT-720	CD-720-2 Pink P42
2/0 AWG	M8 x 25 mm	LCA2/0-56-X	CT-720	CD-720-2 Black P45
3/0 AWG	M8 x 25 mm	LCA3/0-56-X	CT-720	CD-720-2 Orange P50
4/0 AWG	M8 x 25 mm	LCA4/0-56-X	CT-720	CD-720-3 Purple P54
250 kcmil	M8 x 25 mm	LCA250-56-X	CT-720	CD-720-3 Yellow P62
300 kcmil	M8 x 25 mm	LCA300-56-X	CT-720	CD-720-4 White P66

Copper – Two Hole Cable Lugs

Cable size	Bolt size	Cable lug type	Crimping tool	Die
6 AWG	M8 x 25 mm	LCC6-12-L	CT-930	CD-920-6 Blue P24
4 AWG	M8 x 25 mm	LCC4-12-L	CT-930	CD-920-4 Gray P29
3 AWG	M8 x 25 mm			
2 AWG	M8 x 25 mm	LCC2-12-Q	CT-930	CD-920-2 Brown P33
1 AWG	M8 x 25 mm	LCC1-12-E	CT-930	CD-920-1 Green P37
1/0 AWG	M8 x 25 mm	LCC1/0-12-X	CT-930	CD-920-1/0 Pink P42
2/0 AWG	M8 x 25 mm	LCC2/0-12-X	CT-930	CD-920-2/0 Black P45
3/0 AWG	M8 x 25 mm	LCC3/0-12-X	CT-930	CD-920-3/0 Orange P50
4/0 AWG	M8 x 25 mm	LCC4/0-12-X	CT-930	CD-920-4/0 Purple P54
250 kcmil	M8 x 25 mm	LCC250-12-X	CT-930	CD-920-250 Yellow P62
300 kcmil	M8 x 25 mm	LCC300-12-X	CT-930	CD-920-300 White P66

Specifications for 208 V Systems

Input Specifications 208 V

UPS rating	10 kW with N+1 power module	15 kW with N+1 power module	20 kW with N+1 power module	25 kW with N+1 power module
Voltage (V)	200/208/220	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G) WYE (single mains) 3-wire (L1, L2, L3, G) WYE (dual mains)			
Input voltage range (V)	200 V: 170-230 208 V: 177-239 220 V: 187-253			
Frequency range (Hz)	40-70			
Nominal input current (A)	31/30/28	47/45/42	62/60/56	78/75/71
Maximum input current (A)	38/37/35	57/55/52	75/73/69	93/92/86
Input current limitation (A)	40/38/36	59/56/53	78/75/71	93/92/86
Input power factor	0.99 at 100% load			
Total harmonic distortion (THDI)	<6% at full linear load (symmetrical)			
Maximum short circuit rating	65 kA RMS			
Protection	Built-in backfeed protection and fuses			
Ramp-in	Programmable and adaptive 1-40 seconds			

UPS rating	30 kW	40 kW	50 kW
Voltage (V)	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G) WYE (single mains) 3-wire (L1, L2, L3, G) WYE (dual mains)		
Input voltage range (V)	200 V: 170-230 208 V: 177-239 220 V: 187-253		
Frequency range (Hz)	40-70		
Nominal input current (A)	93/90/85	124/119/113	155/149/141
Maximum input current (A)	114/109/104	152/145/137	185/182/172
Input current limitation (A)	117/111/106	156/149/141	185/182/172
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%		
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)		
Maximum short circuit rating	65 kA RMS		
Protection	Built-in backfeed protection and fuses		
Ramp-in	Programmable and adaptive 1-40 seconds		

Bypass Specifications 208 V

UPS rating	10 kW with N+1 power module	15 kW with N+1 power module	20 kW with N+1 power module	25 kW with N+1 power module
Voltage (V)	200/208/220	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G) WYE			
Bypass voltage range (V)	200 V: 180-220 208 V: 187-229 220 V: 198-242			
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)			
Nominal bypass current (A)	30/29/28	45/43/41	59/57/54	74/71/67
Nominal neutral current (A)	50/48/45	75/72/68	100/96/91	125/120/114
Maximum short circuit rating ¹⁴	65 kA RMS			
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s			

UPS rating	30 kW	40 kW	50 kW
Voltage (V)	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G) WYE		
Bypass voltage range (V)	200 V: 180-220 208 V: 187-229 220 V: 198-242		
Frequency range (Hz)	50/60 $\pm$ 1, 50/60 $\pm$ 3, 50/60 $\pm$ 10 (user selectable)		
Nominal bypass current (A)	88/85/81	119/114/108	148/142/135
Nominal neutral current (A)	150/144/136	200/192/182	250/240/227
Maximum short circuit rating ¹⁴	65 kA RMS		
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 400 A, prearcing 33 kA ² s		

14. Conditioned by the internal fuse rated 400 A, prearcing 33 kA²s.

Output Specifications 208 V

UPS rating	10 kW with N+1 power module	15 kW with N+1 power module	20 kW with N+1 power module	25 kW with N+1 power module
Voltage (V)	200/208/220	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G)			
Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%			
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 125% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)			
Dynamic load response	± 5% after 2 milliseconds ± 1% after 50 milliseconds			
Output power factor	1			
Nominal output current (A)	29/28/26	43/42/39	58/56/52	73/70/66
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz ± 0.1% free-running			
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6			
Total harmonic distortion (THDU)	<1% for linear load <5% for non-linear load	<1% for linear load <3% for non-linear load		
Load crest factor	2.5			
Load power factor	From 0.7 leading to 0.7 lagging without any derating			

UPS rating	30 kW	40 kW	50 kW
Voltage (V)	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, G)		
Output voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$		
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 125% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)		
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds		
Output power factor	1		
Nominal output current (A)	87/83/79	115/111/105	144/139/131
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm 0.1\%$ free-running		
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6		
Total harmonic distortion (THDU)	<1% for linear load <5% for non-linear load		
Load crest factor	2.5		
Load power factor	From 0.7 leading to 0.7 lagging without any derating		

Battery Specifications 208 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Protection of the energy storage device: An overcurrent protective device must be located in close proximity to the energy storage device.

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

UPS rating	10 kW with N+1 power module	15 kW with N+1 power module	20 kW with N+1 power module	25 kW with N+1 power module	30 kW	40 kW	50 kW
Charging power in % of output power at 0-40% load	80%						
Charging power in % of output power at 100% load	20%						
Maximum charging power (at 0-40% load) (kW)	8	12	16	20	24	32	40
Maximum charging power (at 100% load) (kW)	2	3	4	5	6	8	10
Nominal battery voltage (VDC)	480						
Nominal float voltage (VDC)	545						
Maximum boost voltage (VDC)	572						
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C						
End of discharge voltage (full load) (VDC)	384						
Battery current at full load and nominal battery voltage (A)	22	33	44	55	65	87	109
Battery current at full load and minimum battery voltage (A)	27	41	54	68	81	109	136
Ripple current	< 5% C20 (5 minute runtime)						
Battery test	Manual/automatic (selectable)						
Maximum short circuit rating	10 kA						

Recommended Cable Sizes 208 V

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 300 kcmil.

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

The maximum number of cable connections per busbar: Two on input/output/bypass busbars; Four on DC busbars; Six on N/G busbars.

NOTE: Overcurrent protection is to be provided by others.

Cable sizes in this manual are based on Table 310.15 (B)(16) of the National Electrical Code (NEC) with the following assertions:

- 90 °C (194 °F) conductors (75 °C (167 °F) termination)
- An ambient temperature of 30 °C (86 °F)
- Use of copper conductors

If the ambient temperature is greater than 30 °C (86 °F), larger conductors are to be selected in accordance with the correction factors of the NEC.

Equipment grounding conductors (EGC) are sized in accordance with NEC Article 250.122 and Table 250.122.

NOTE: Recommended cable sizes and maximum allowable cable size may vary for the auxiliary products. Not all auxiliary products support aluminum cables. Refer to the installation manual provided with the auxiliary product.

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

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.

UPS rating	10 kW with N+1 power module	15 kW with N +1 power module	20 kW with N +1 power module	25 kW with N +1 power module	30 kW	40 kW	50 kW
Input phases (AWG/kcmil)	8	4	3	2	1/0	3/0	4/0
Input EGC (AWG/kcmil)	10	8	8	6	6	6	4
Bypass/output phases (AWG/kcmil)	8	6	4	3	2	1/0	3/0
Bypass EGC/output EGC (AWG/kcmil)	10	10	8	8	6	6	6
Neutral (AWG/kcmil)	6	3	1	2/0	3/0	2 x 1/0	2 x 2/0
DC+/DC-(AWG/kcmil)	10	8	6	4	4	2	1/0
DC EGC (AWG/kcmil)	10	10	8	8	6	6	6

NOTE: Cable sizes are based on 80% rated circuit breakers for UIB, UOB, MBB, SSIB, and 100% rated circuit breaker for battery breaker(s).

Recommended Upstream Protection 208 V

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- For parallel systems, instantaneous override (li) values must not be set higher than 1250 A. Place the label 885-92556 adjacent to the upstream circuit breaker to inform about the hazard.
- In parallel systems with three or more UPSs, a circuit breaker must be installed on the output of each UPS. The unit output breaker (UOB) instantaneous override (li) values must not be set higher than 1250 A.

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

⚠️ CAUTION

HAZARD OF FIRE

- Connect only to a circuit with the below specifications.
- Connect to a circuit provided with a 250 A branch circuit overcurrent protection maximum in accordance with the National Electrical Code, ANSI/NFPA70, and the Canadian Electrical Code, Part I, C22.1.

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

NOTE: Overcurrent protection is to be provided by others and marked with its function.

UPS rating	10 kW with N+1 power module		15 kW with N+1 power module		20 kW with N+1 power module		25 kW with N+1 power module	
	Input	Bypass	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36100U31X						HJF36150-U31X	HJF36100-U31X
Ir setting	50	40	80	60	100	80	125	100
Tr at 6 Ir setting	0.5							
li (x In) setting	1.5							

UPS rating	30 kW		40 kW		50 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36150U31X		JJF36250U31X	HJF36150U31X	JJF36250U31X	
Ir setting	150	110	200	150	250	200
Tr at 6 Ir setting	0.5					
li (x In) setting	1.5					

Recommended Bolt and Lug Sizes for UL

NOTICE

RISK OF EQUIPMENT DAMAGE

Use only UL approved compression cable lugs.

Failure to follow these instructions can result in equipment damage.

Copper – One Hole Cable Lugs

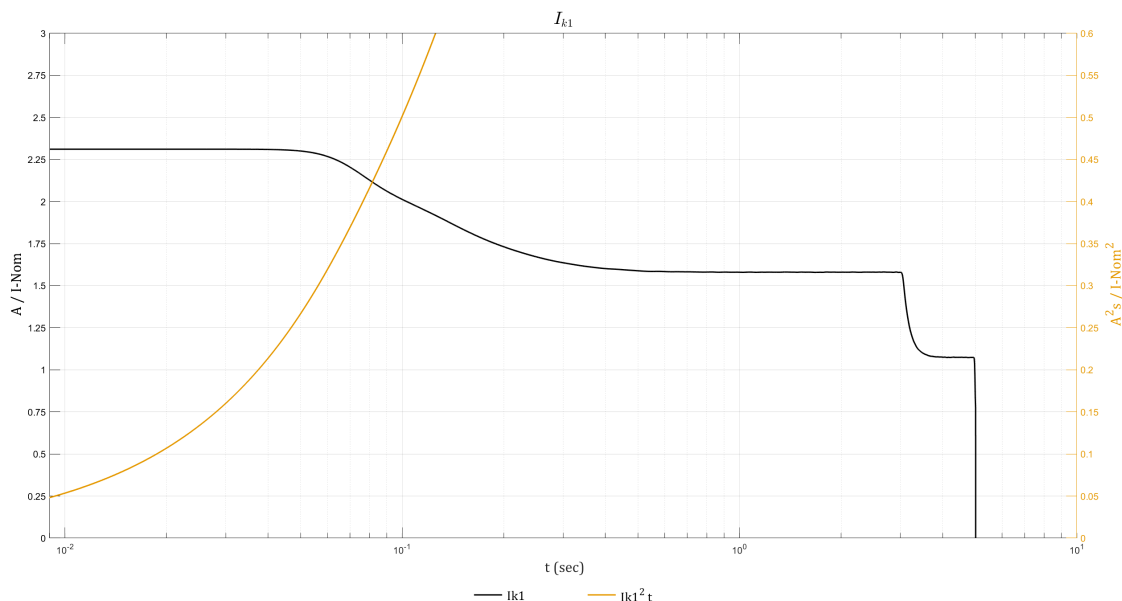
Cable size	Bolt size	Cable lug type	Crimping tool	Die
10 AWG	M8 x 25 mm	LCA10-56-L	NA	NA
8 AWG	M8 x 25 mm	LCA8-56-L	CT-720	CD-720-1 Red P21
6 AWG	M8 x 25 mm	LCA6-56-L	CT-720	CD-720-1 Blue P24
4 AWG	M8 x 25 mm	LCA4-56-L	CT-720	CD-720-1 Gray P29
3 AWG	M8 x 25 mm	LCA4-56-L	CT-720	CD-720-1 Gray P29
2 AWG	M8 x 25 mm	LCA2-56-Q	CT-720	CD-720-1 Brown P33
1 AWG	M8 x 25 mm	LCA1-56-E	CT-720	CD-720-2 Green P37
1/0 AWG	M8 x 25 mm	LCA1/0-56-X	CT-720	CD-720-2 Pink P42
2/0 AWG	M8 x 25 mm	LCA2/0-56-X	CT-720	CD-720-2 Black P45
3/0 AWG	M8 x 25 mm	LCA3/0-56-X	CT-720	CD-720-2 Orange P50
4/0 AWG	M8 x 25 mm	LCA4/0-56-X	CT-720	CD-720-3 Purple P54
250 kcmil	M8 x 25 mm	LCA250-56-X	CT-720	CD-720-3 Yellow P62
300 kcmil	M8 x 25 mm	LCA300-56-X	CT-720	CD-720-4 White P66

Copper – Two Hole Cable Lugs

Cable size	Bolt size	Cable lug type	Crimping tool	Die
6 AWG	M8 x 25 mm	LCC6-12-L	CT-930	CD-920-6 Blue P24
4 AWG	M8 x 25 mm	LCC4-12-L	CT-930	CD-920-4 Gray P29
3 AWG	M8 x 25 mm			
2 AWG	M8 x 25 mm	LCC2-12-Q	CT-930	CD-920-2 Brown P33
1 AWG	M8 x 25 mm	LCC1-12-E	CT-930	CD-920-1 Green P37
1/0 AWG	M8 x 25 mm	LCC1/0-12-X	CT-930	CD-920-1/0 Pink P42
2/0 AWG	M8 x 25 mm	LCC2/0-12-X	CT-930	CD-920-2/0 Black P45
3/0 AWG	M8 x 25 mm	LCC3/0-12-X	CT-930	CD-920-3/0 Orange P50
4/0 AWG	M8 x 25 mm	LCC4/0-12-X	CT-930	CD-920-4/0 Purple P54
250 kcmil	M8 x 25 mm	LCC250-12-X	CT-930	CD-920-250 Yellow P62
300 kcmil	M8 x 25 mm	LCC300-12-X	CT-930	CD-920-300 White P66

Inverter Short Circuit Capabilities (Bypass not Available)

IK1 – Short Circuit between a Phase and Neutral



IK1 400 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	67 / 45	67 / 89	67 / 134	58 / 418	46 / 2411
30	100 / 100	100 / 200	100 / 300	87 / 940	68 / 5420
40	133 / 180	133 / 360	133 / 530	116 / 1670	91 / 9640
50	167 / 280	167 / 560	167 / 830	145 / 2610	114 / 15070
60	200 / 400	200 / 800	200 / 1200	174 / 3760	137 / 21700
80	267 / 710	267 / 1420	267 / 2140	232 / 6690	182 / 38580
100	334 / 1110	334 / 2230	334 / 3340	291 / 10450	228 / 60270

IK1 480 V

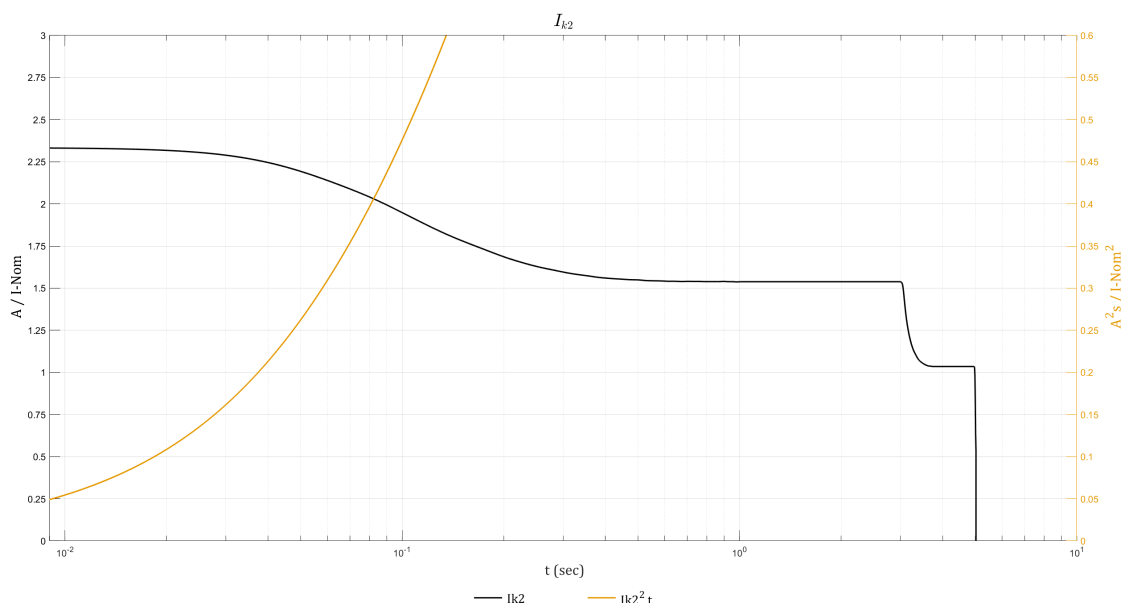
S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	56 / 31	56 / 62	56 / 93	48 / 290	38 / 1674
30	83 / 70	83 / 140	83 / 210	73 / 650	57 / 3770
40	111 / 120	111 / 250	111 / 370	97 / 1160	76 / 6700
50	139 / 190	139 / 390	139 / 580	121 / 1810	95 / 10460
60	167 / 280	167 / 560	167 / 830	145 / 2610	114 / 15070
80	222 / 490	222 / 990	222 / 1480	194 / 4640	152 / 26790
100	278 / 770	278 / 1550	278 / 2320	242 / 7260	190 / 41860

IK1 208 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
10	64 / 41	64 / 82	64 / 123	56 / 386	44 / 2229
15	96 / 93	96 / 185	96 / 278	84 / 869	66 / 5015
20	128 / 160	128 / 330	128 / 490	112 / 1550	88 / 8920
25	160 / 260	160 / 510	160 / 770	140 / 2420	110 / 13930

IK1 208 V (Continued)

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
30	192 / 370	192 / 740	192 / 1110	168 / 3480	132 / 20060
40	257 / 660	257 / 1320	257 / 1980	224 / 6180	175 / 35670
50	321 / 1030	321 / 2060	321 / 3090	279 / 9660	219 / 55730

IK2 – Short Circuit between Two Phases**IK2 400 V**

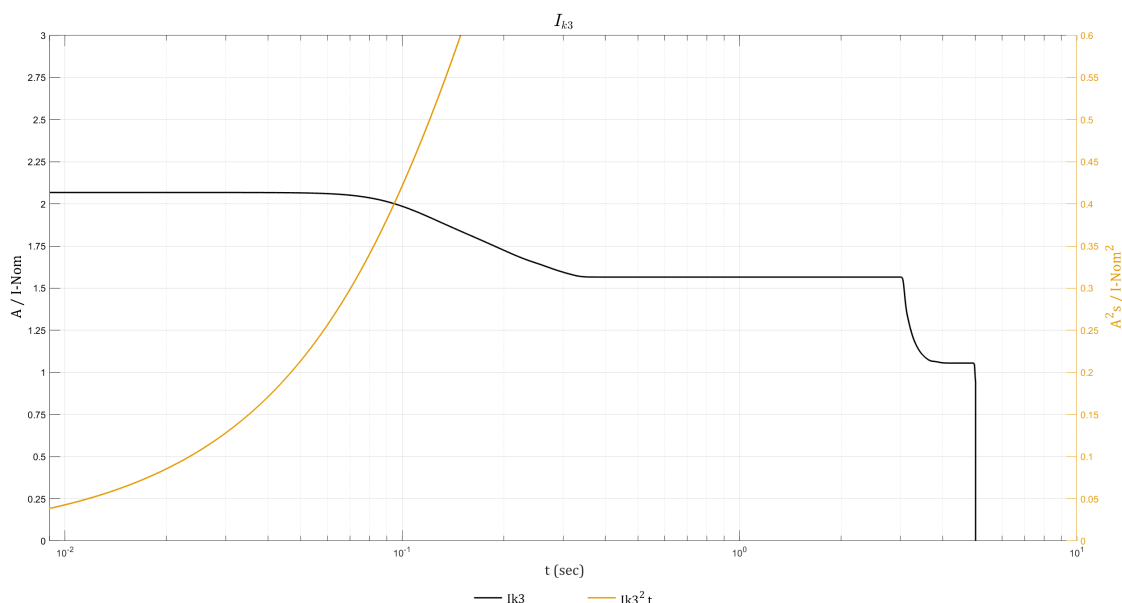
S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	67 / 45	67 / 90	67 / 135	56 / 397	44 / 2284
30	101 / 100	100 / 200	100 / 300	84 / 890	67 / 5140
40	135 / 180	134 / 360	134 / 540	112 / 1590	89 / 9140
50	168 / 280	167 / 570	167 / 840	141 / 2480	111 / 14280
60	202 / 410	201 / 810	201 / 1210	169 / 3570	133 / 20560
80	269 / 730	268 / 1450	268 / 2150	225 / 6350	178 / 36550
100	336 / 1130	335 / 2260	335 / 3370	281 / 9920	222 / 57110

IK2 480 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	56 / 31	56 / 63	56 / 94	47 / 276	37 / 1586
30	84 / 70	84 / 140	84 / 210	70 / 620	55 / 3570
40	112 / 130	112 / 250	112 / 370	94 / 1100	74 / 6350
50	140 / 200	139 / 390	139 / 580	117 / 1720	92 / 9910
60	168 / 280	167 / 570	167 / 840	141 / 2480	111 / 14280
80	224 / 500	223 / 1000	223 / 1500	187 / 4410	148 / 25380
100	280 / 790	279 / 1570	279 / 2340	234 / 6890	185 / 39660

IK2 208 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
10	65 / 42	64 / 84	64 / 125	54 / 367	43 / 2112
15	97 / 94	96 / 188	96 / 280	81 / 825	64 / 4752
20	129 / 170	129 / 330	129 / 500	108 / 1470	85 / 8450
25	162 / 260	161 / 520	161 / 780	135 / 2290	107 / 13200
30	194 / 380	193 / 750	193 / 1120	162 / 3300	128 / 19010
40	259 / 670	257 / 1340	257 / 1990	216 / 5870	171 / 33790
50	323 / 1050	322 / 2090	322 / 3110	270 / 9170	213 / 52800

IK3 – Short Circuit between Three Phases**IK3 400 V**

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	60 / 36	60 / 71	60 / 107	57 / 351	45 / 2294
30	90 / 80	90 / 160	90 / 240	86 / 790	68 / 5160
40	119 / 140	119 / 290	119 / 430	115 / 1400	90 / 9180
50	149 / 220	149 / 450	149 / 670	143 / 2200	113 / 14340
60	179 / 320	179 / 640	179 / 960	172 / 3160	136 / 20650
80	239 / 570	239 / 1140	239 / 1710	229 / 5620	181 / 36710
100	298 / 890	298 / 1780	298 / 2670	287 / 8780	226 / 57350

IK3 480 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
20	50 / 25	50 / 49	50 / 74	48 / 244	38 / 1593
30	75 / 60	75 / 110	75 / 170	72 / 550	57 / 3580
40	99 / 100	99 / 200	99 / 300	96 / 980	75 / 6370
50	124 / 150	124 / 310	124 / 460	119 / 1520	94 / 9960
60	149 / 220	149 / 450	149 / 670	143 / 2200	113 / 14340

IK3 480 V (Continued)

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
80	199 / 400	199 / 790	199 / 1190	191 / 3900	151 / 25490
100	249 / 620	249 / 1240	249 / 1860	239 / 6100	188 / 39830

IK3 208 V

S [kVA]	10ms; I[A]/I ² t [A ² t]	20ms; I[A]/I ² t [A ² t]	30ms; I[A]/I ² t [A ² t]	100ms; I[A]/I ² t [A ² t]	1s; I[A]/I ² t [A ² t]
10	57 / 33	57 / 66	57 / 99	55 / 325	43 / 2121
15	86 / 74	86 / 148	86 / 222	83 / 731	65 / 4772
20	115 / 130	115 / 260	115 / 400	110 / 1300	87 / 8480
25	143 / 210	143 / 410	143 / 620	138 / 2030	109 / 13260
30	172 / 300	172 / 590	172 / 890	165 / 2920	130 / 19090
40	230 / 530	230 / 1050	230 / 1580	220 / 5200	174 / 33940
50	287 / 820	287 / 1650	287 / 2470	276 / 8120	217 / 53020

Torque Specifications

Bolt size	Torque
M4	1.7 Nm (1.25 lb-ft / 15 lb-in)
M5	2.2 Nm (1.62 lb-ft / 19.5 lb-in)
M6	5 Nm (3.69 lb-ft / 44.3 lb-in)
M8	17.5 Nm (12.91 lb-ft / 154.9 lb-in)
M10	30 Nm (22 lb-ft / 194.7 lb-in)
M12	50 Nm (36.87 lb-ft / 442.5 lb-in)

Environment

	Operating	Storage
Temperature	0 °C to 40 °C (32 °F to 104 °F)	-15 °C to 40 °C (5 °F to 104 °F) for systems with batteries.
Relative humidity	5 - 95% non-condensing	10 - 80% non-condensing
Elevation	Designed for operation in 0-3000 m (0-10000 feet) elevation. Power derating required from 1000-3000 m (3300-10000 feet): Up to 1000 m (3300 feet): 1.000 Up to 1500 m (5000 feet): 0.975 Up to 2000 m (6600 feet): 0.950 Up to 2500 m (8300 feet): 0.925 Up to 3000 m (10000 feet): 0.900	
Audible noise one meter (three feet) from unit	400 V 20-60 kW: 49 dB at 70% load, 54 dB at 100% load 400 V 80-100 kW: 57 dB at 70% load, 65 dB at 100% load 480 V 20-60 kW: 49 dB at 70% load, 54 dB at 100% load 480 V 80-100 kW: 57 dB at 70% load, 65 dB at 100% load 208 V 10-30 kW: 49 dB at 70% load, 54 dB at 100% load 208 V 40-50 kW: 57 dB at 70% load, 65 dB at 100% load	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

Compliance

Safety	IEC 62040-1: 2017, Edition 2.0, Uninterruptible Power Systems (UPS) - Part 1: Safety requirements UL 1778 5th edition
EMC/EMI/RFI	IEC 62040-2: 2016, 3rd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements C2 FCC Part 15 Subpart B, Class A IEEE C62.41-1991 Location Category B2, IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
Transportation	IEC 60721-4-2 Level 2M1
Seismic	ICC-ES AC 156 (2015): OHSPD Pre-approved; Sds=1.33 g for z/h=1 and Sds=1.63 g for z/h=0; Ip= 1.5
Earthing system	TN-C, TN-S, TT, IT
Overvoltage category	This UPS is OVCII compliant. If the UPS is installed in an environment with an OVC rating higher than II, an SPD (surge protection device) must be installed upstream of the UPS to reduce the overvoltage category to OVCII.
Protective class	I
Pollution degree	2

Performance

Performance in accordance with: IEC 62040-3: 2021, 3rd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements.

Output performance classification (according to IEC 62040-3, Clause 5.3.4): VFI-SS-11

UPS Weights and Dimensions

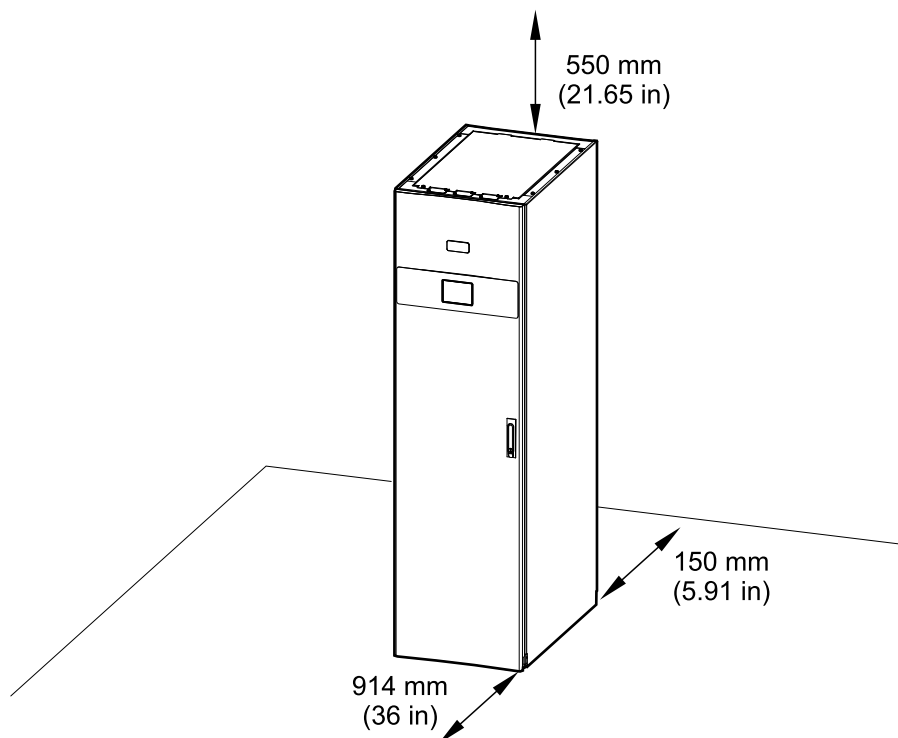
UPS rating	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
20 kW UPS 400 V with three battery strings ¹⁵	650 (1433)	1970 (77.56)	550 (21.65)	847 (33.35)
30-50 kW UPS 400 V with three battery strings ¹⁵	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)
60 kW UPS 400 V with three battery strings	665 (1466)	1970 (77.56)	550 (21.65)	847 (33.35)
80-100 kW UPS 400 V with three battery strings	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)
20 kW UPS 480 V with three battery strings ¹⁵	650 (1433)	1970 (77.56)	550 (21.65)	847 (33.35)
30-50 kW UPS 480 V with three battery strings ¹⁵	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)
60 kW UPS 480 V with three battery strings	665 (1466)	1970 (77.56)	550 (21.65)	847 (33.35)
80-100 kW UPS 480 V with three battery strings	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)
10 kW UPS 208 V with three battery strings ¹⁵	650 (1433)	1970 (77.56)	550 (21.65)	847 (33.35)
15-25 kW UPS 208 V with three battery strings ¹⁵	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)
30 kW UPS 208 V with three battery strings	665 (1466)	1970 (77.56)	550 (21.65)	847 (33.35)
40-50 kW UPS 208 V with three battery strings	680 (1500)	1970 (77.56)	550 (21.65)	847 (33.35)

NOTE: One battery module weighs approximately 32 kg (70.5 lbs).

¹⁵ UPS model with N+1 power module.

Clearance

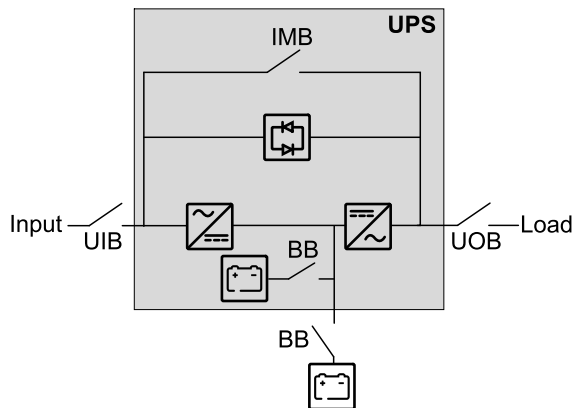
NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.



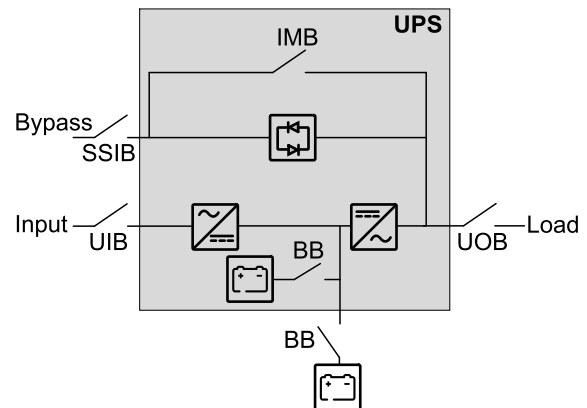
Single System Overview

UIB	Unit input breaker
SSIB	Static switch input breaker
IMB	Internal maintenance breaker
UOB	Unit output breaker
BB	Battery breaker in UPS for internal batteries and in external battery solution (if present)

Single System – Single Mains



Single System – Dual Mains



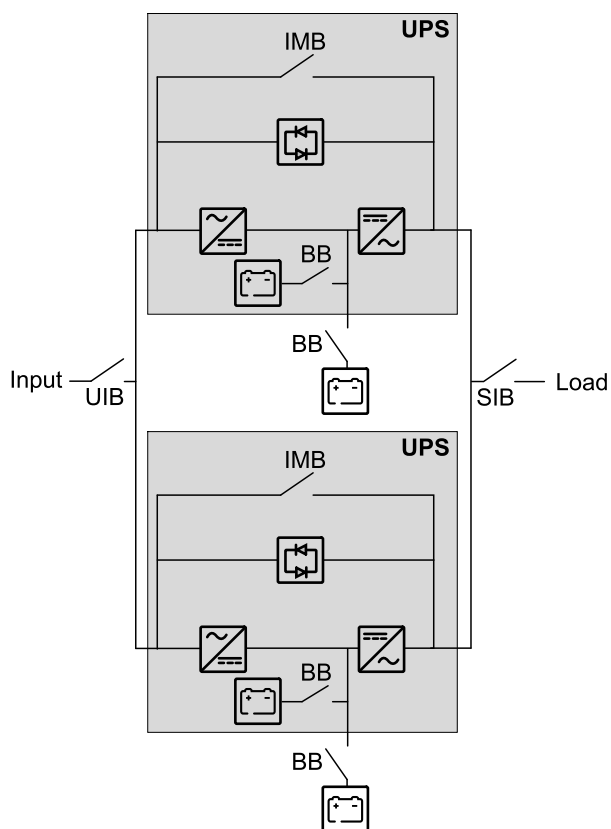
Parallel System Overview

UIB	Unit input breaker
SSIB	Static switch input breaker
IMB	Internal maintenance breaker
UOB	Unit output breaker
SIB	System isolation breaker
BB	Battery breaker in UPS for internal batteries and in external battery solution (if present)
MBB	External maintenance bypass breaker

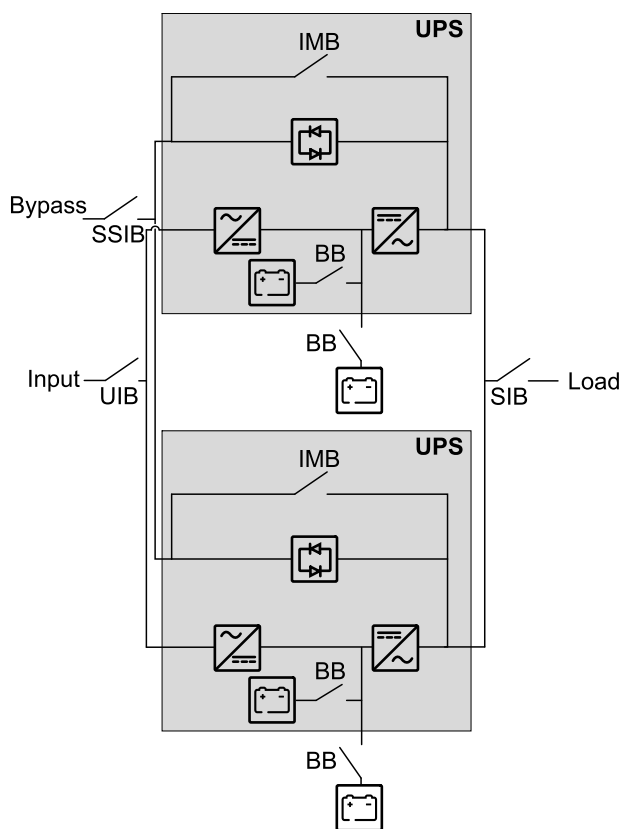
Simplified 1+1 Parallel Systems

Galaxy VS can support 2 UPSs in a simplified 1+1 parallel system for redundancy with shared unit input breaker UIB and static switch input breaker SSIB.

Simplified 1+1 Parallel System – Single Mains



Simplified 1+1 Parallel System – Dual Mains

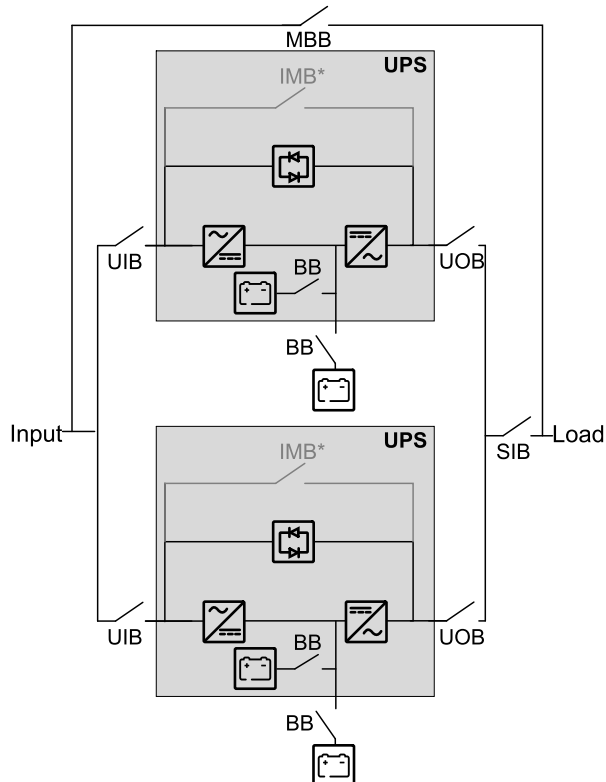


Parallel Systems with Individual Unit Input Breaker UIB and Static Switch Input Breaker SSIB

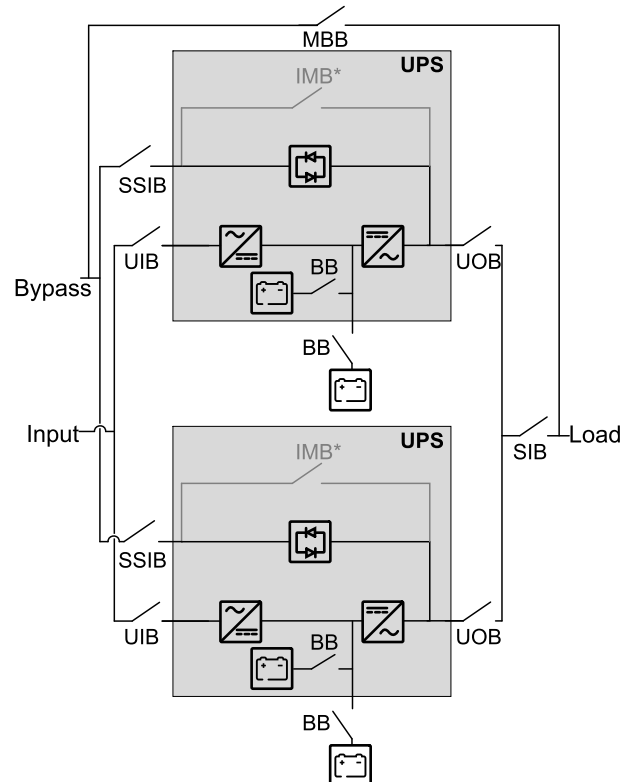
Galaxy VS can support up to 4 UPSs in parallel for capacity and up to 3+1 UPSs in parallel for redundancy with individual unit input breaker UIB and static switch input breaker SSIB.

NOTE: The internal maintenance breaker IMB can only be used in a simplified 1+1 parallel system. In any other parallel system, an external maintenance bypass breaker MBB must be provided and the internal maintenance breaker IMB* must be padlocked in the open position.

Parallel System – Single Mains



Parallel System – Dual Mains

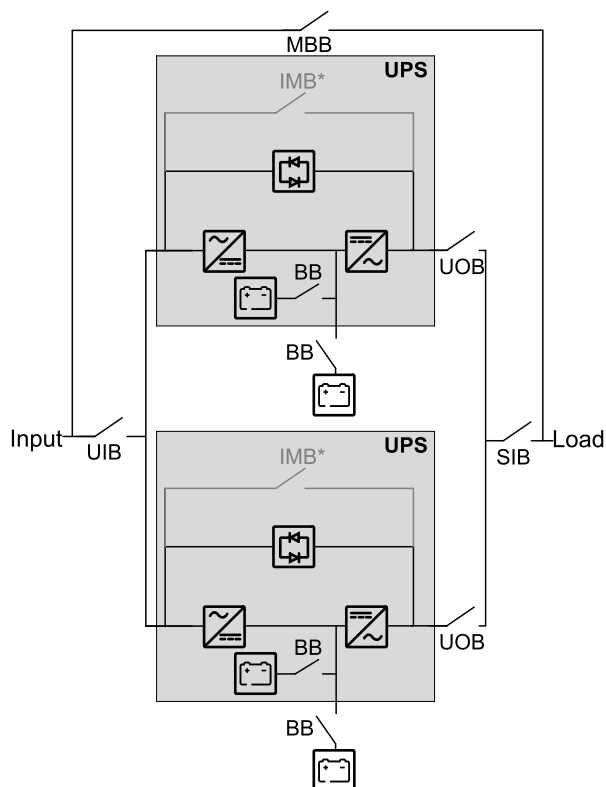


Parallel Systems with Shared Unit Input Breaker UIB and Static Switch Input Breaker SSIB

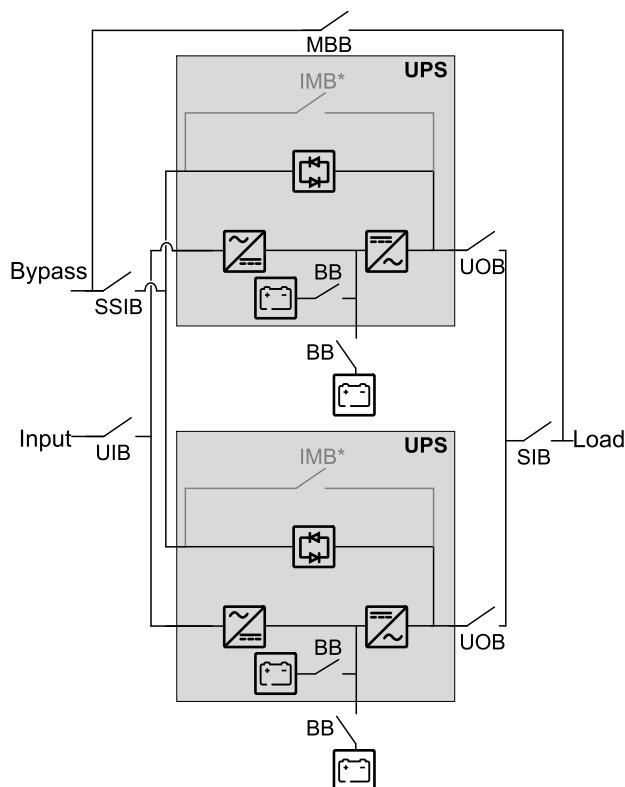
Galaxy VS can support up to 4 UPSs in parallel for capacity and up to 3+1 UPSs in parallel for redundancy with shared unit input breaker UIB and static switch input breaker SSIB.

NOTE: The internal maintenance breaker IMB can only be used in a simplified 1+1 parallel system. In any other parallel system, an external maintenance bypass breaker MBB must be provided and the internal maintenance breaker IMB* must be padlocked in the open position.

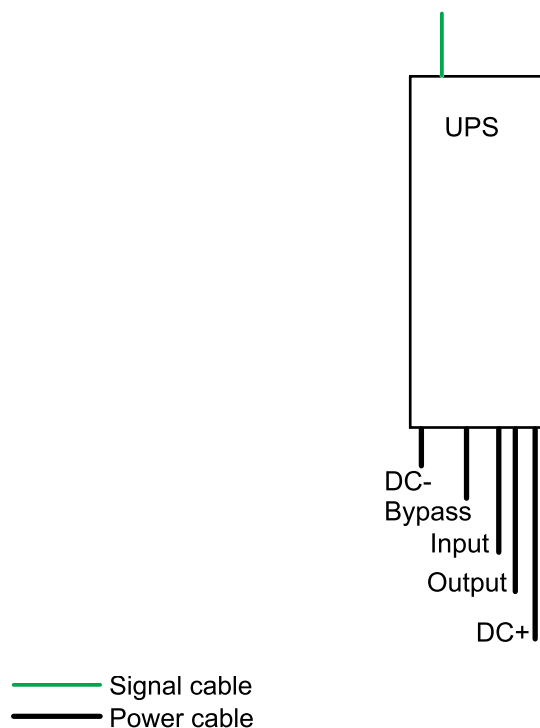
Parallel System – Single Mains



Parallel System – Dual Mains



Installation Procedure for Single Systems

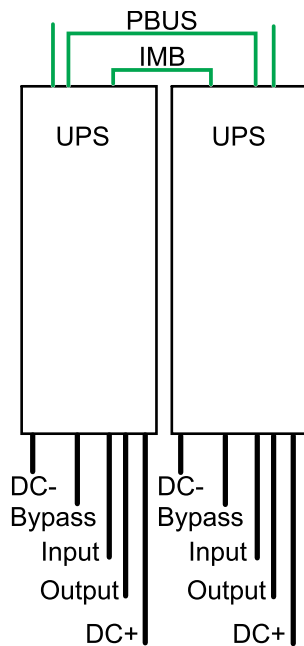


1. Install the Seismic Anchoring (Option), page 52.
2. Prepare for Installation, page 54.
3. Convert to a Dual Mains System, page 58.
4. Connect the Power Cables, page 59.
5. Connect the Power Cables from an Adjacent Modular Battery Cabinet, page 61.
6. Prepare for Signal Cables, page 62.
7. Connect the Signal Cables, page 63.
8. Connect the Signal Cables from a Modular Battery Cabinet, page 65.
9. Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 68.
10. Connect the External Communication Cables, page 74.
11. Connect the Modbus Cables, page 74.
12. Add Translated Safety Labels to Your Product, page 76.
13. Final Installation, page 77.

For moving or decommissioning the UPS after installation has been completed, see Decommission or Move the UPS to a New Location, page 80.

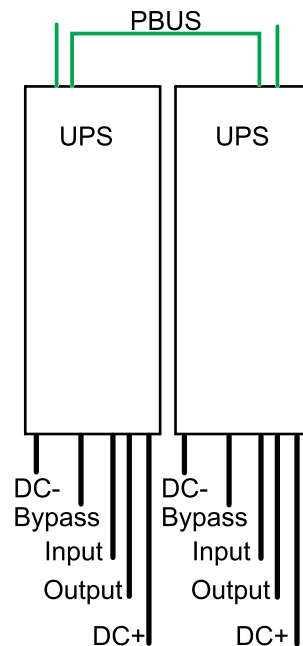
Installation Procedure for Parallel Systems

Simplified 1+1 Parallel System



— Signal cable
— Power cable

Parallel System



1. Install the Seismic Anchoring (Option), page 52.
2. Prepare for Installation, page 54.
3. Convert to a Dual Mains System, page 58.
4. Connect the Power Cables, page 59.
5. Connect the Power Cables from an Adjacent Modular Battery Cabinet, page 61.
6. Prepare for Signal Cables, page 62.
7. Connect the Signal Cables, page 63.
8. Connect the Signal Cables from a Modular Battery Cabinet, page 65.
9. Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 68.
10. Perform one of the following:
 - **For simplified 1+1 parallel system:** Connect the IMB Signal Cables in a Simplified 1+1 Parallel System, page 70.
 - **For parallel system:** Lock the internal maintenance bypass breaker IMB in the open position on all UPSs in the parallel system with a padlock.
11. Connect the PBUS Cables, page 73.
12. Connect the External Communication Cables, page 74.
13. Connect the Modbus Cables, page 74.
14. Add Translated Safety Labels to Your Product, page 76.
15. Final Installation, page 77.

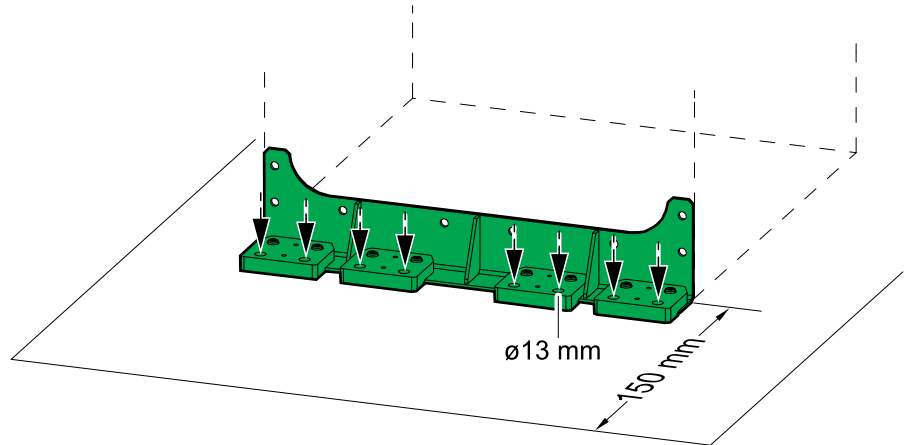
For moving or decommissioning the UPS after installation has been completed, see [Decommission or Move the UPS to a New Location](#), page 80.

Install the Seismic Anchoring (Option)

Use the optional seismic kit GVSOPT016 for this procedure.

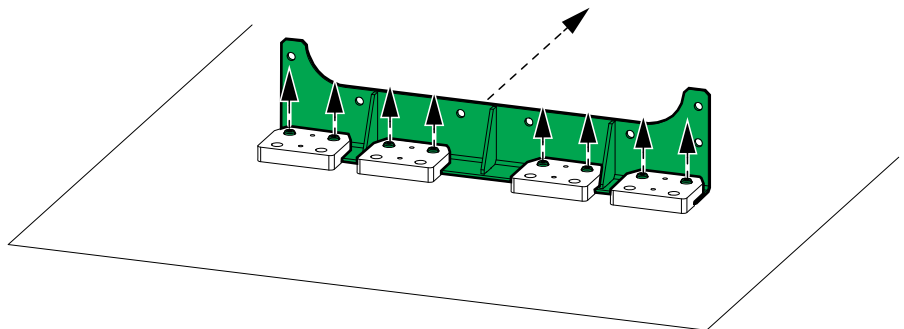
1. Mount the rear anchor assembly to the floor. Use appropriate hardware for the floor type – the hole diameter in the rear anchors is $\varnothing 13$ mm. Minimum requirement is M12 grade 8.8 hardware.

Rear View



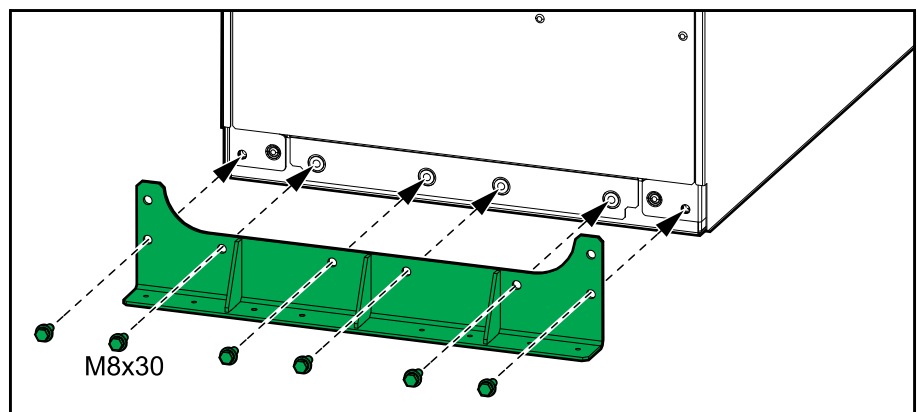
2. Remove the bolts and remove the rear anchoring bracket. Save the bolts for adjacent installation of cabinets.

Rear View



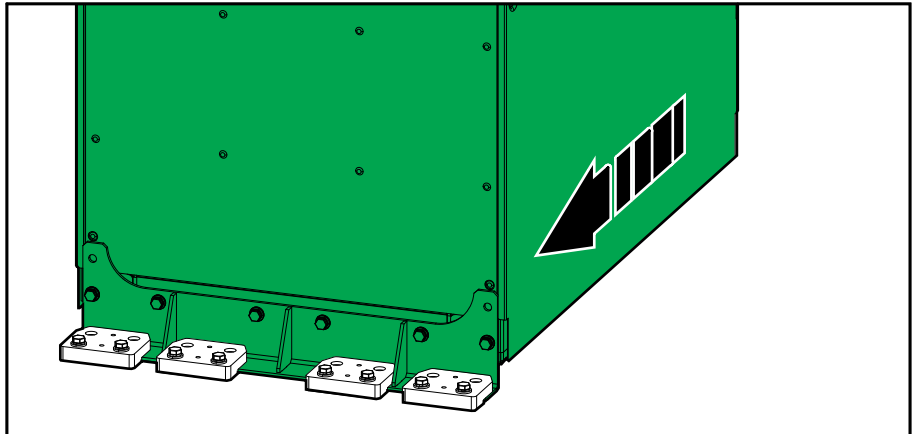
3. Install the rear anchoring bracket on the UPS with the provided M8 bolts.

Rear View of the UPS



4. Push the UPS into position so the rear anchoring bracket connects to the rear anchors. The front anchoring bracket is installed in the final installation steps.

Rear View of the UPS



Prepare for Installation

⚡ ⚠ DANGER

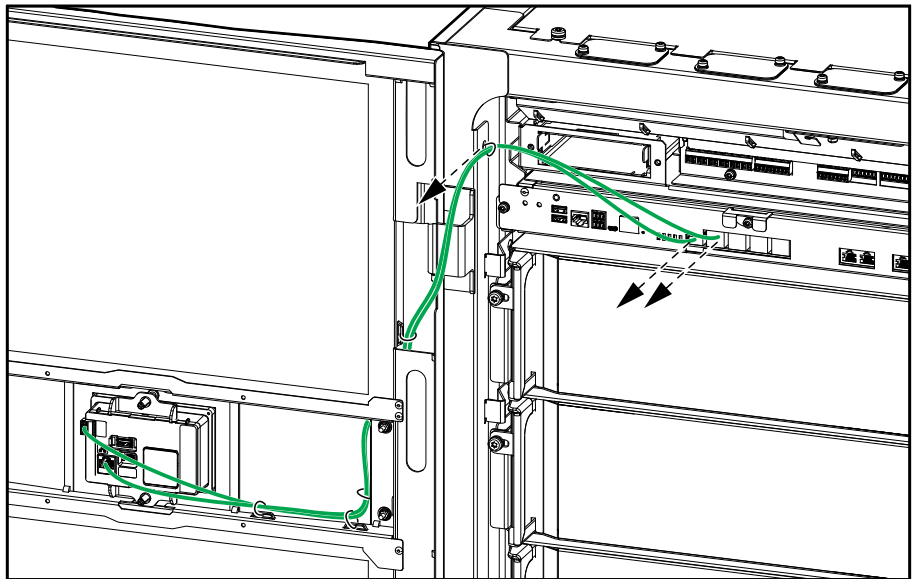
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables.

1. Disconnect the two signal cables from the display on the UPS and remove the front door.



2. **For UPS without preinstalled power modules:** Install the power modules starting with the bottom shelf:
- Remove the screw in each side of the empty power module shelf.
 - Push the power module onto the shelf.
 - Reinstall the screw in each side of the shelf.

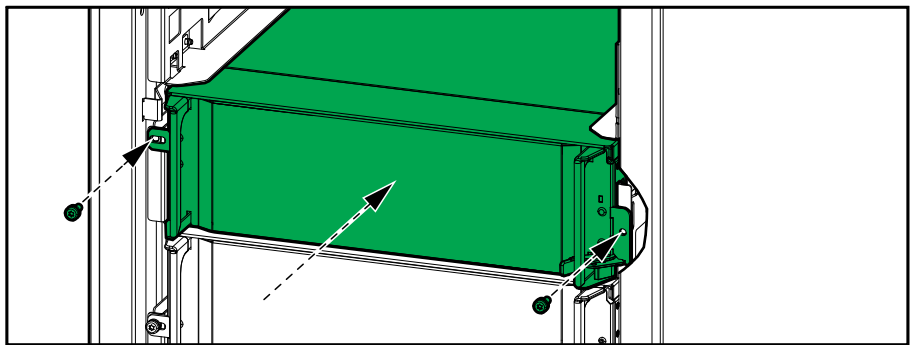
⚠ CAUTION

HEAVY LOAD

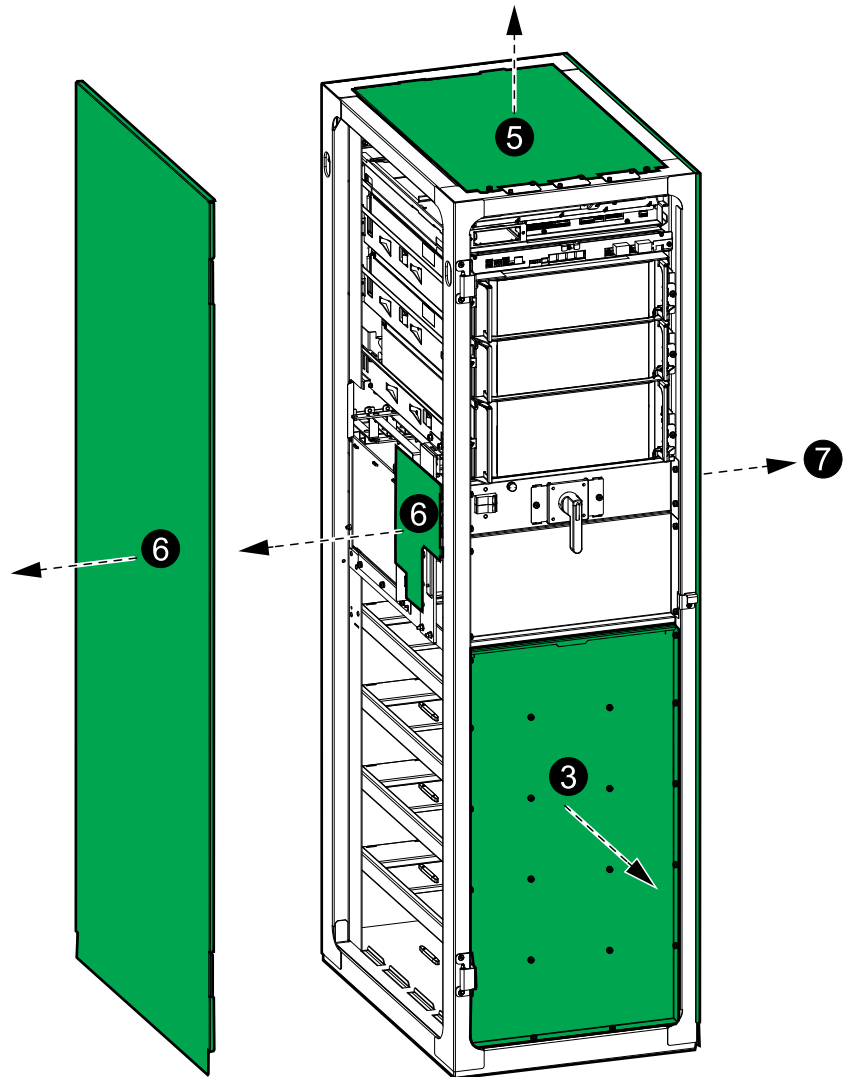
Power modules are heavy and require two persons to lift.

- 20 kW power module weighs 25 kg (55 lbs).
- 50 kW power module weighs 38 kg (84 lbs).

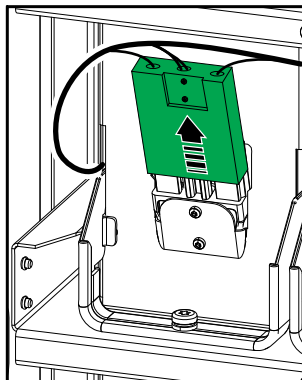
Failure to follow these instructions can result in injury or equipment damage.



3. Remove the battery cover.



4. Disconnect the battery terminals from the front of any preinstalled battery modules.

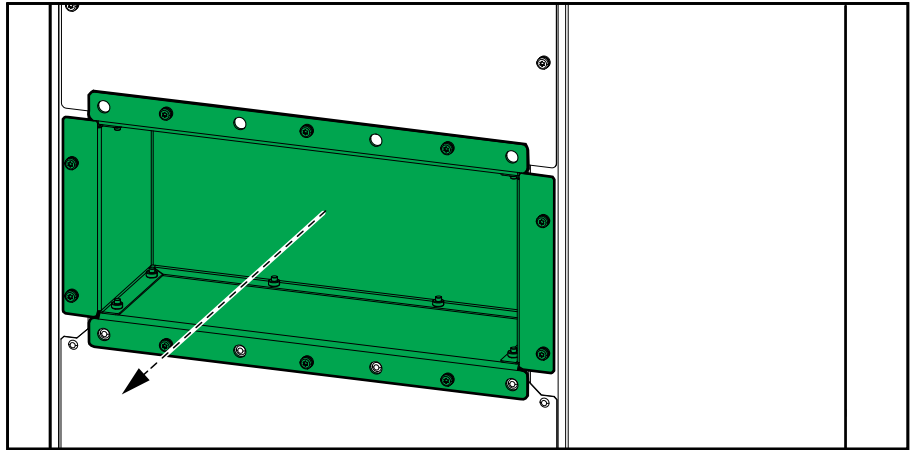
5. **For installation with a modular battery cabinet:** Remove the top plate:

- a. Remove the screws and tilt the front of the top plate upwards.
- b. Slide the top plate towards the front to remove it. Taps in the rear of the top plate must disconnect from the slots in the rear of the UPS.

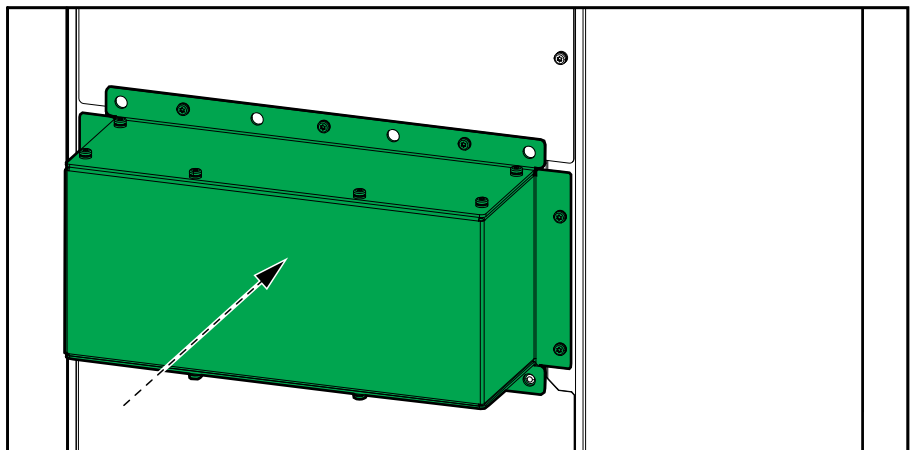
6. **For installation with an adjacent modular battery cabinet:** Remove the left side panel and the plate. Discard the plate.7. **For installation with a maintenance bypass cabinet or simplified 1+1 parallel installation:** Remove the right side panel. Save the right side panel.

8. Remove the conduit box from the rear of the UPS.

Rear View of the UPS

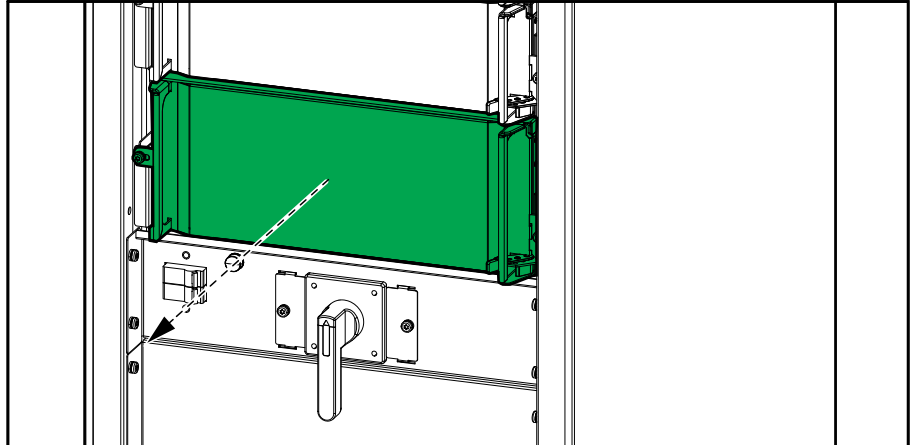


9. Remove the top or bottom gland plate from the conduit box.
10. Drill/punch holes for power cables/conduits in the top or bottom gland plate. Install conduits (not provided), if applicable.
11. Reinstall the top or bottom gland plate on the conduit box.
12. Install the conduit box on the UPS. Note that the conduit box is installed in the reverse position.

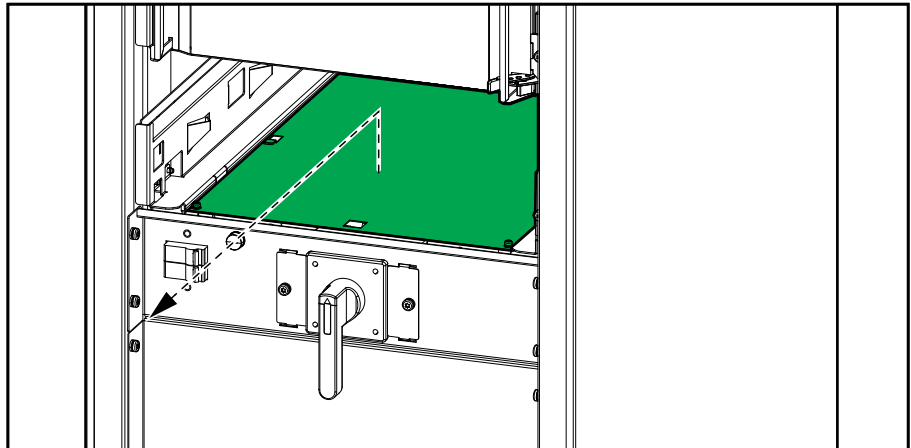


Convert to a Dual Mains System

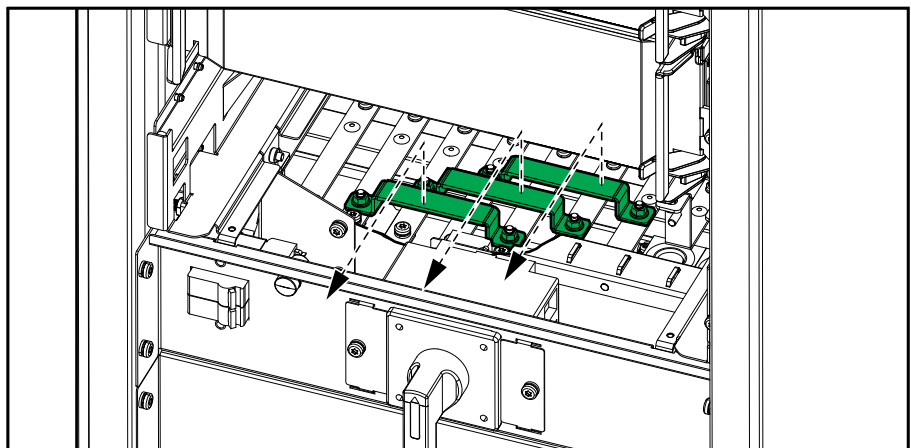
1. Remove the static switch module.



2. Remove the indicated plate.



3. Remove the three single mains jumper busbars.



4. Reinstall the plate and the static switch module.

Connect the Power Cables

NOTICE

RISK OF EQUIPMENT DAMAGE

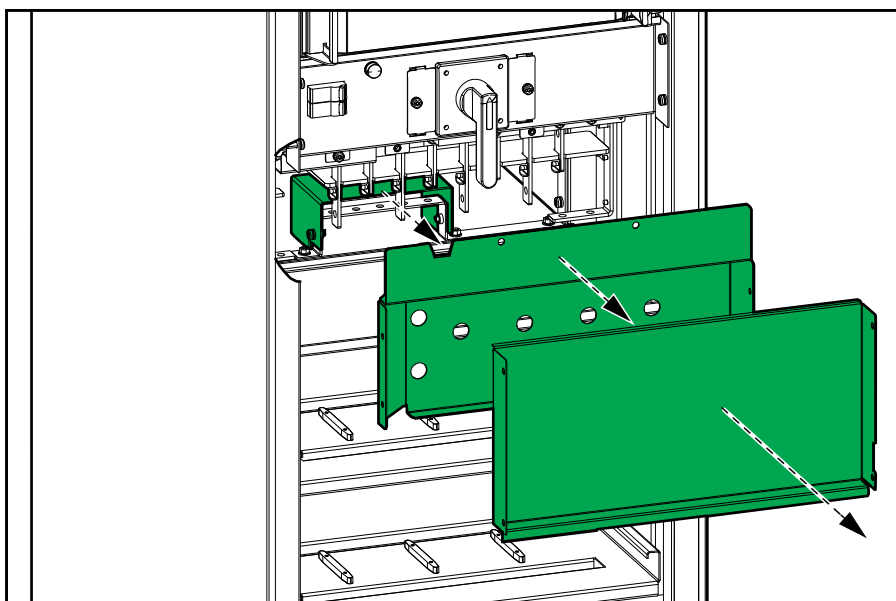
To ensure correct load sharing in bypass operation in a parallel system:

- All bypass cables must be the same length for all UPSs.
- All output cables must be the same length for all UPSs.
- All input cables must be the same length for all UPSs (only required in single mains system).

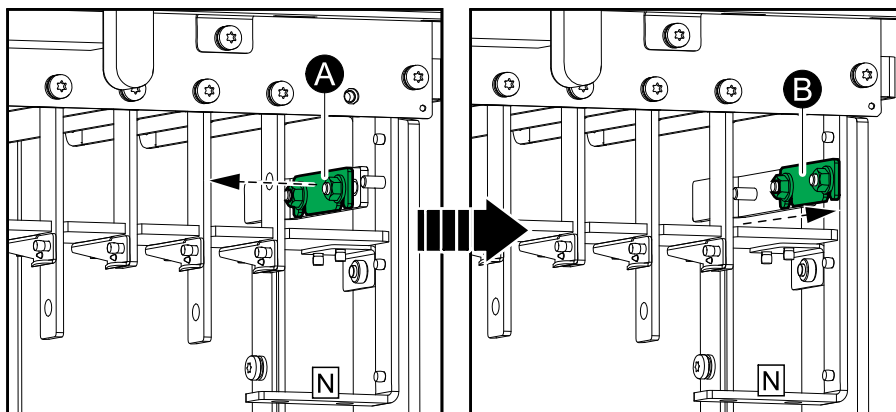
Failure to follow these instructions can result in equipment damage.

NOTE: The UPS is preconfigured for TNS earthing system. 3-wire installation using a bonding busbar will result in a higher leakage current.

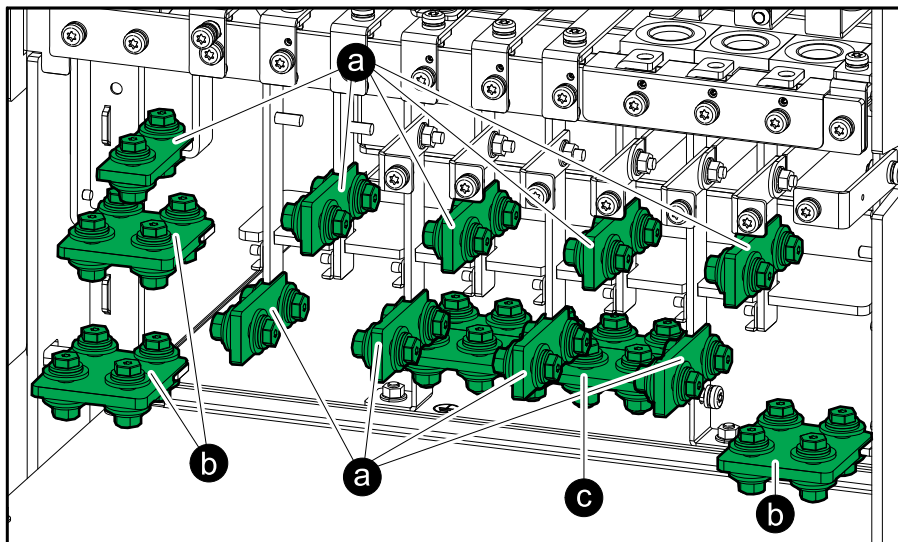
1. Remove the indicated plates.



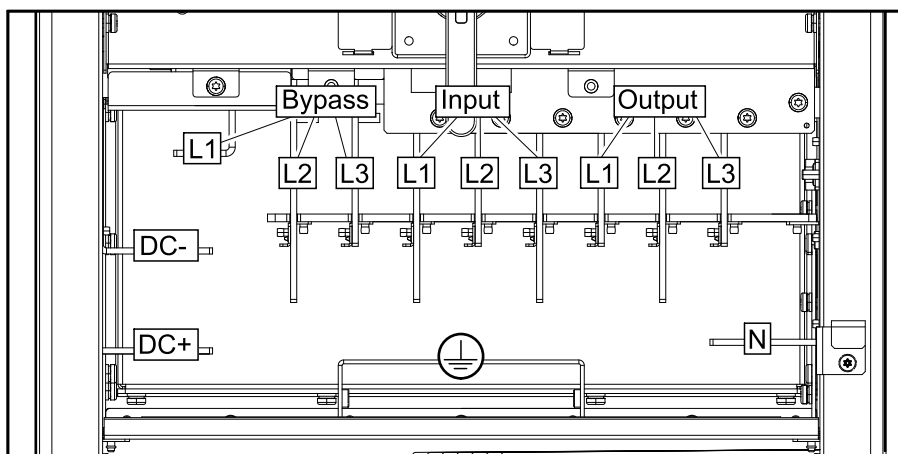
2. **Only for TN-C/3-wire earthing system:** Move the bonding busbar from position (A) to position (B) to connect the N busbar to the G/PE busbar.



3. **Only for NEMA 2 hole plates:** Install the optional kit GVSOPT020 for NEMA 2 hole plates:
 - a. Install the nine NEMA 2 hole plates for input/bypass/output (part number 880-5803) as indicated.
 - b. Install the three NEMA 2 hole plates for DC and N (part number 880-5802) as indicated.
 - c. Install the NEMA 2 hole plate for equipment grounding conductor/PE (part number 880-5801) as indicated.



4. Route the power cables in through the conduit box and to the front of the UPS.
5. Connect the equipment grounding conductor/PE cables.
6. Connect the input cables.
7. **For dual mains system:** Connect the bypass cables.
8. Connect the output cables.
9. **For installation with a remote modular battery cabinet:** Connect the DC cables to the DC busbars.
10. **For installation with an adjacent modular battery cabinet:** See [Connect the Power Cables from an Adjacent Modular Battery Cabinet](#), page 61.



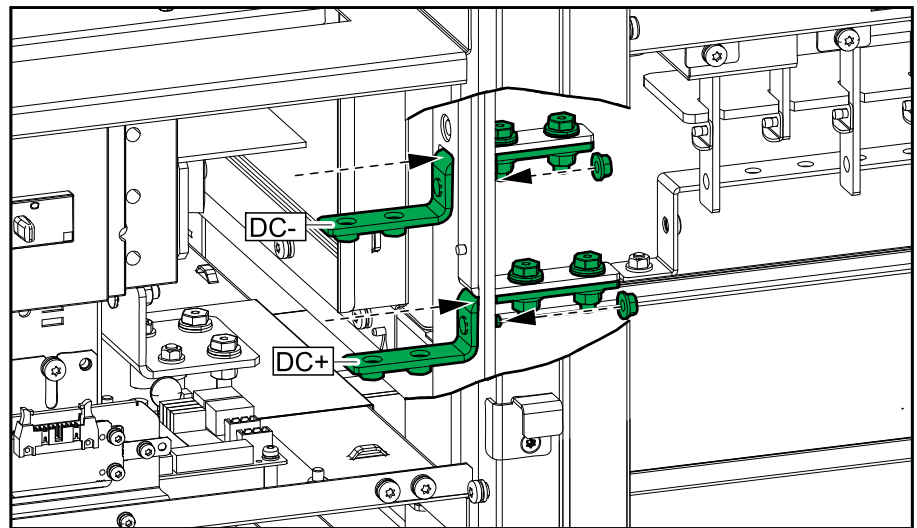
11. Reinstall the three plates removed in step 1.

Connect the Power Cables from an Adjacent Modular Battery Cabinet

Use installation kit 0H-220042 from the modular battery cabinet for this procedure.

1. Set the battery breakers BB to the open (OFF) position and disconnect the battery terminals from the front of any preinstalled battery modules in the modular battery cabinet(s) and the UPS.
2. Connect the preinstalled equipment grounding conductor/PE cable from modular battery cabinet 1 to the G/PE busbar in the UPS.
3. Install the provided DC extension busbars in the UPS.

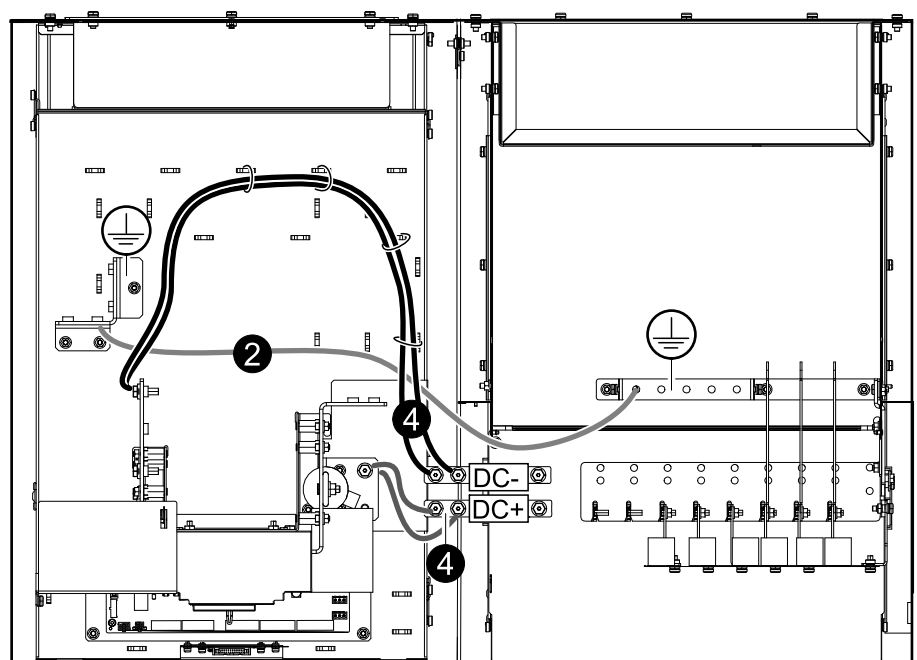
Front View of Modular Battery Cabinet 1 and the UPS



4. Connect the preinstalled DC cables from modular battery cabinet 1 to the DC extension busbars in the UPS.

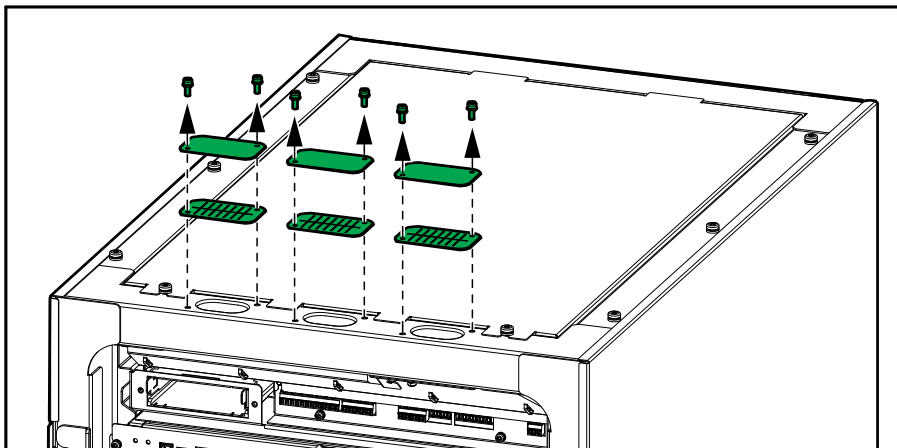
NOTE: The preinstalled DC cables come in pairs: Two cables for DC- connection and two cables for DC+ connection. Ensure to connect all pairs between modular battery cabinet 1 and the UPS.

Top View of Modular Battery Cabinet 1 and the UPS

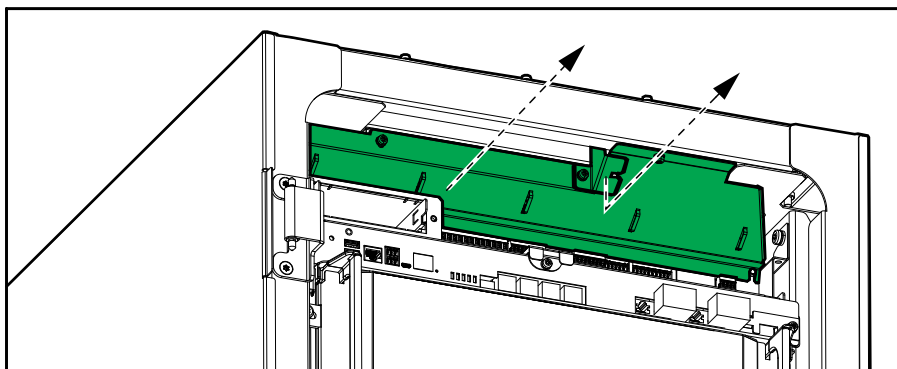


Prepare for Signal Cables

1. Remove the top gland plates and the top brush plates from the UPS. These are for signal cable routing.

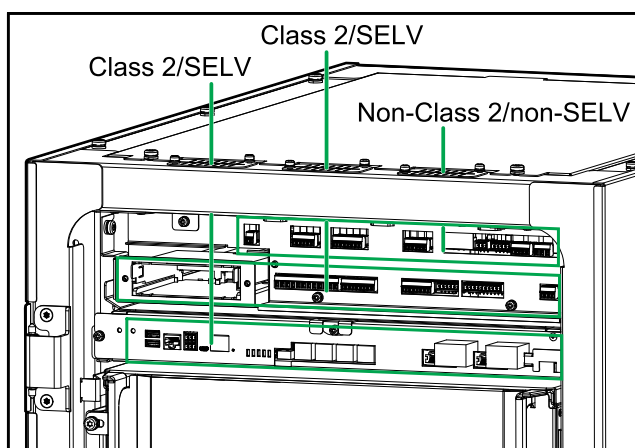


2. Perform one of the following:
 - **For installation without conduits:** Reinstall the brush plates.
 - **For installation with conduits:** Drill a hole in the gland plates for conduits, install conduits, and reinstall the gland plates.
3. Remove the indicated covers.

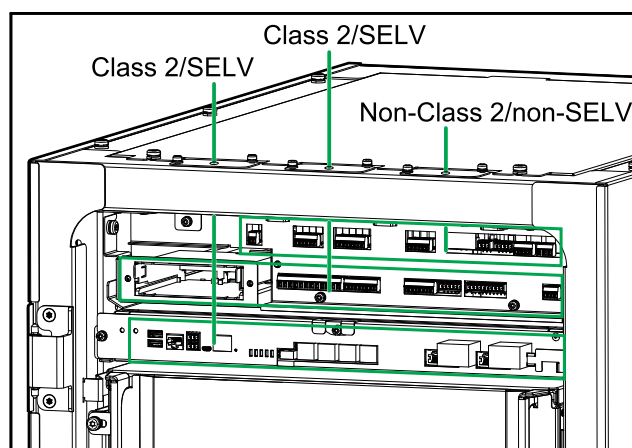


4. Route the non-Class 2/non-SELV signal cables through the right brush/gland plate.
5. Route the Class 2/SELV signal cables through the left and middle brush/gland plate.

UPS without Conduits



UPS with Conduits



Connect the Signal Cables

⚠ CAUTION

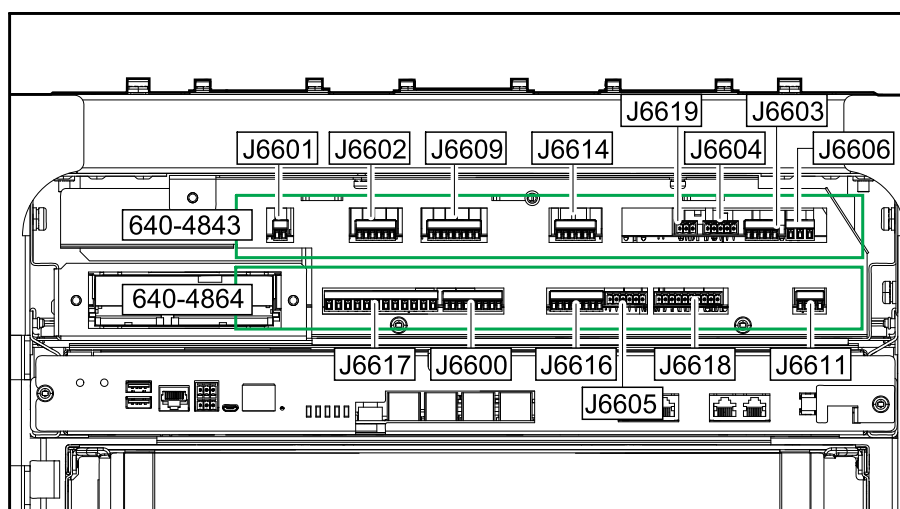
RISK OF EQUIPMENT DAMAGE

All Class 2/SELV signal cables shall be double insulated/jacket cable and minimum rated for 30 VDC. All non-Class 2/non-SELV signal cables shall be double insulated/jacket cable and minimum rated for 600 VAC.

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

NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables.

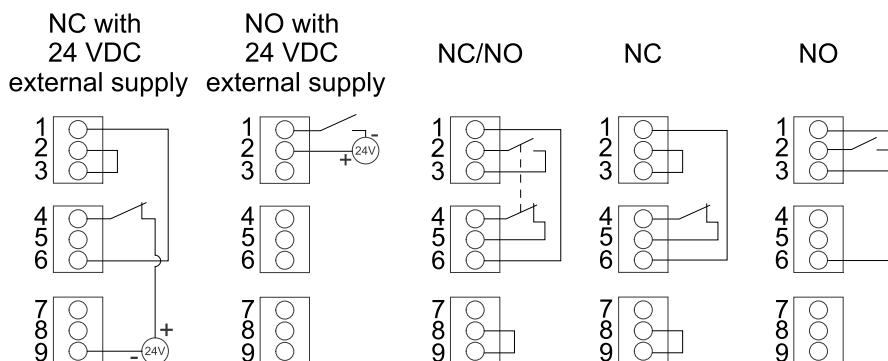
Front View of the UPS – Board 640-4843 and 640-4864



1. Connect the Class 2/SELV signal cables from the building EPO to board 640-4864 terminal J6600 in the UPS according to one of the options below.

The EPO circuit is considered Class 2/SELV. Class 2/SELV circuits must be isolated from the primary circuitry. Do not connect any circuit to the EPO terminal block unless it can be confirmed that the circuit is Class 2/SELV.

EPO Configurations (640-4864 terminal J6600, 1-9)



The EPO input supports 24 VDC.

NOTE: The default setting for the EPO activation is to turn off the inverter.

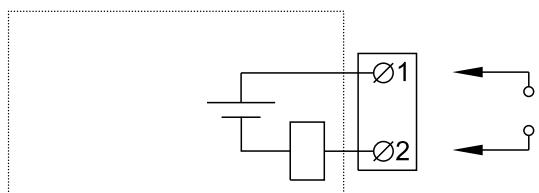
If you want the EPO activation to transfer the UPS into forced static bypass operation instead, please contact Schneider Electric.

2. Connect the Class 2/SELV signal cables from the auxiliary products to board 640-4864 in the UPS. Follow the instructions in the auxiliary product manuals.

3. Connect the Class 2/SELV signal cables to the input contacts and output relays on board 640-4864 in the UPS.

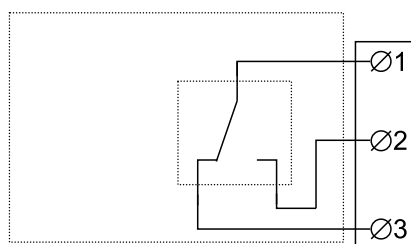
Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.

The input contacts support 24 VDC 10 mA. All circuits connected must have the same 0 V reference.



Name	Description	Location
IN _1 (input contact 1)	Configurable input contact	640-4864 terminal J6616, 1-2
IN _2 (input contact 2)	Configurable input contact	640-4864 terminal J6616, 3-4
IN _3 (input contact 3)	Configurable input contact	640-4864 terminal J6616, 5-6
IN _4 (input contact 4)	Configurable input contact	640-4864 terminal J6616, 7-8

The output relays support 24 VAC/VDC 1 A. All external circuitry must be fused with maximum 1 A fast acting fuses.



Name	Description	Location
OUT _1 (output relay 1)	Configurable output relay	640-4864 terminal J6617, 1-3
OUT _2 (output relay 2)	Configurable output relay	640-4864 terminal J6617, 4-6
OUT _3 (output relay 3)	Configurable output relay	640-4864 terminal J6617, 7-9
OUT _4 (output relay 4)	Configurable output relay	640-4864 terminal J6617, 10-12

4. Connect the non-Class 2/non-SELV signal cables from the auxiliary products to board 640-4843 in the UPS. Follow the instructions in the auxiliary product manuals.

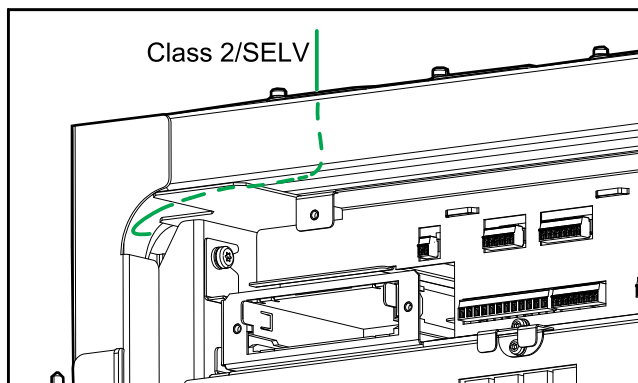
Connect the Signal Cables from a Modular Battery Cabinet

NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables.

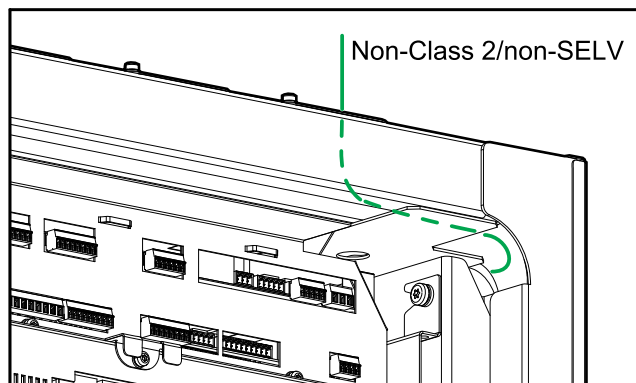
1. Only for remote modular battery cabinet:

- a. Route the Class 2/SELV cables and non-Class 2/non-SELV cables into the UPS as shown.

Class 2/SELV

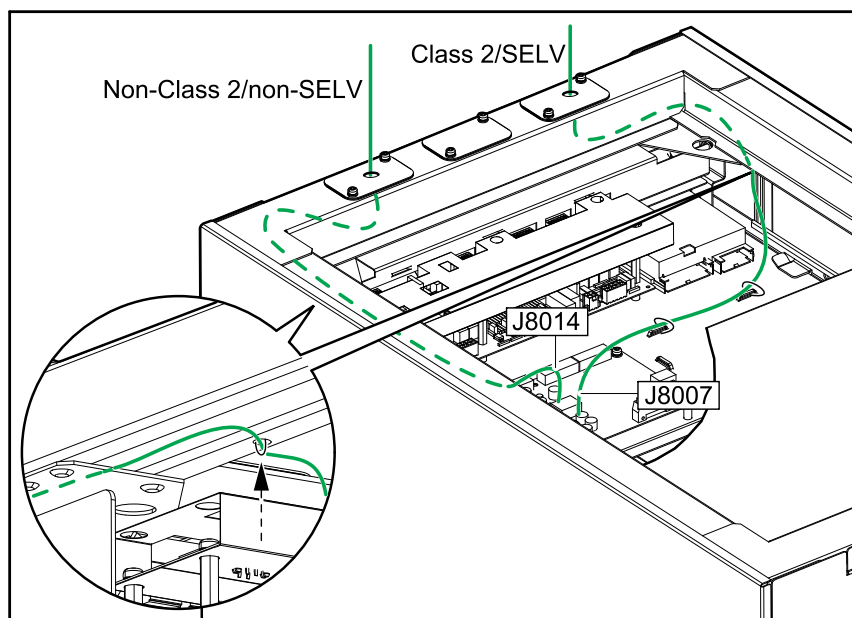


Non-Class 2/non-SELV



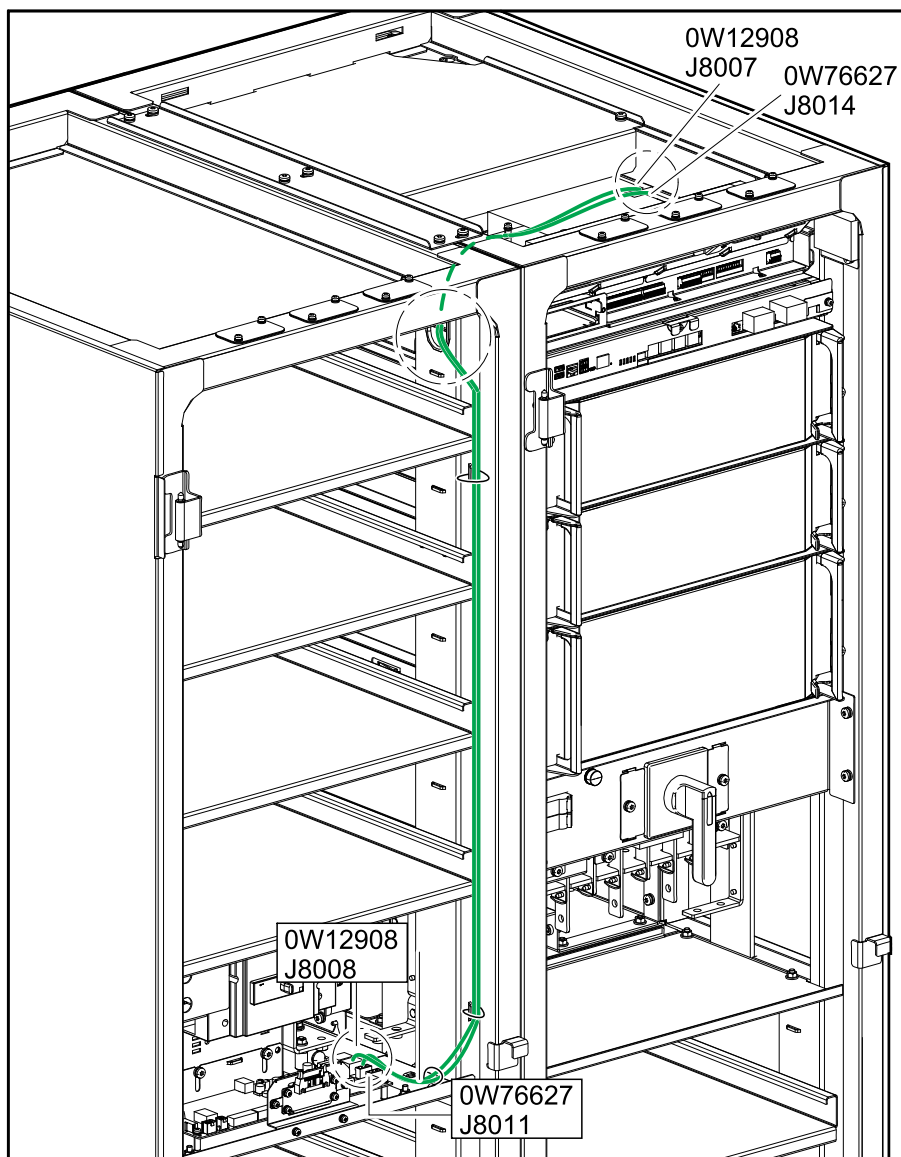
- b. Route the Class 2/SELV cables and non-Class 2/non-SELV cables to board 640-7552 in the UPS.

Top View of the UPS



2. **Only for adjacent modular battery cabinet:** Route the provided signal cables 0W76627 and 0W12908 to board 640-7552 in the UPS.

Front View of Adjacent Modular Battery Cabinet 1 and the UPS

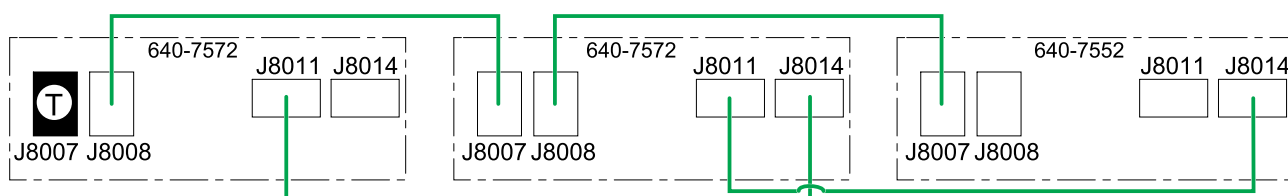


3. Connect the signal cables from modular battery cabinet 1 to the UPS:
- Disconnect the termination plug from J8007 on board 640-7552 in the UPS.
 - Mount the termination plug in J8007 on board 640-7572 in the last modular battery cabinet (T).
 - Connect the signal cable from J8011 on board 640-7572 in modular battery cabinet 1 to J8014 on board 640-7552 in the UPS.
 - Connect the signal cable from J8008 on board 640-7572 in modular battery cabinet 1 to J8007 on board 640-7552 in the UPS.

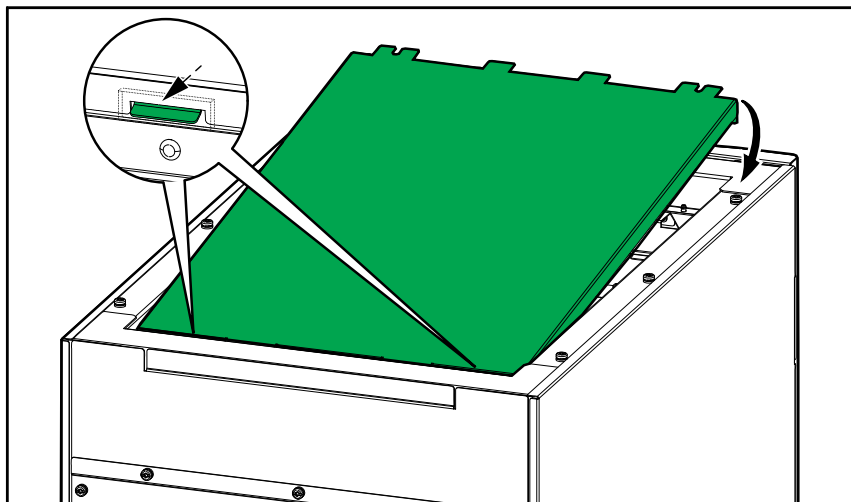
Modular Battery Cabinet 2,3,4

Modular Battery Cabinet 1

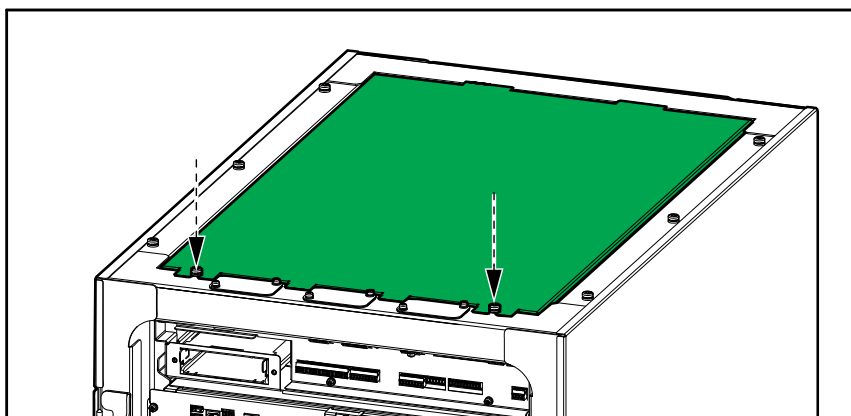
UPS



4. Reinstall the top plate on the UPS.
 - a. Tilt the top plate and slide it onto the UPS from the rear. Tabs in the rear of the top plate must connect to slots in the rear of the UPS.

Rear View of the UPS

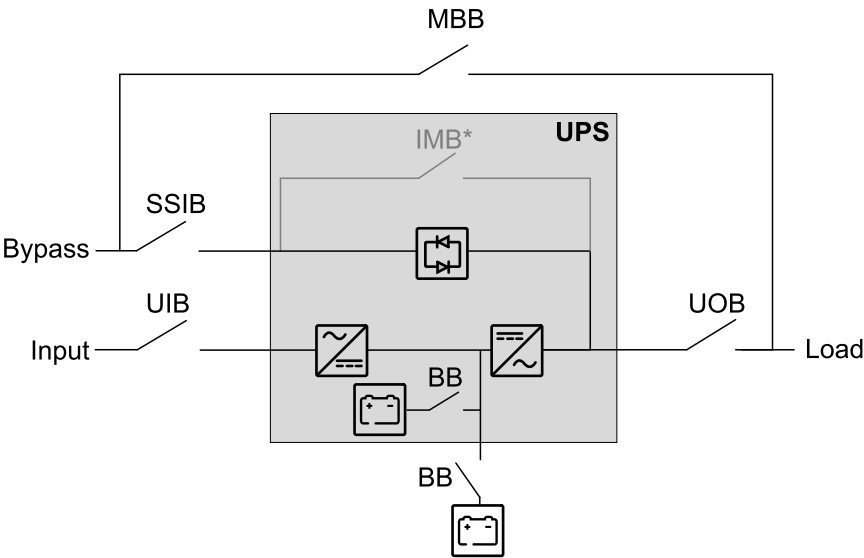
- b. Push the top plate down in the front and reinstall the screws.



Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products

NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables.

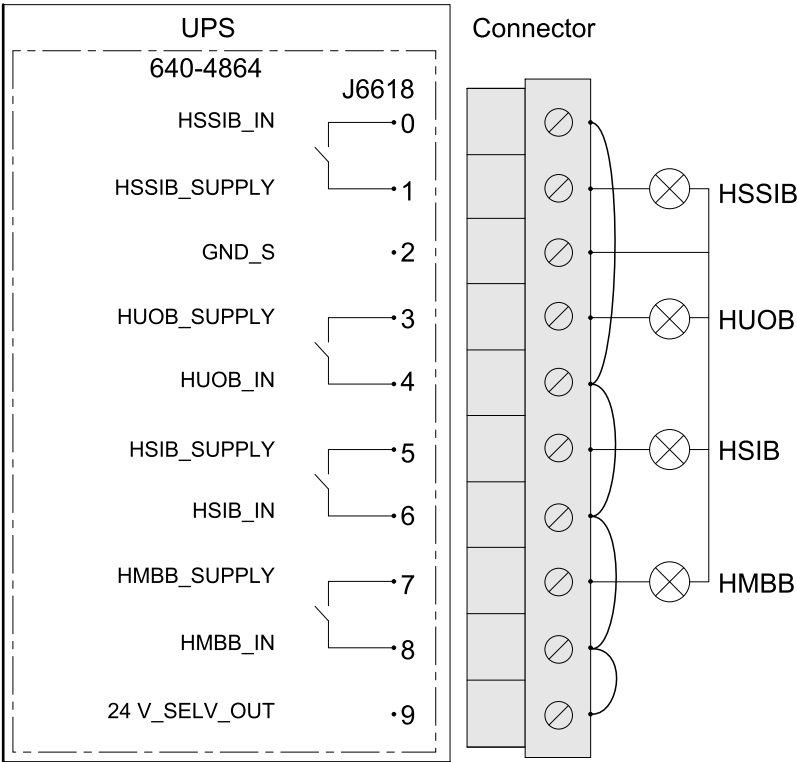
Example of Single System with Third-Party Switchgear



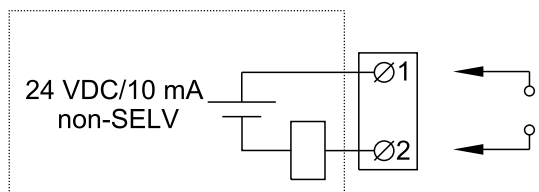
NOTE: The internal maintenance breaker IMB* cannot be used in a system with an external maintenance bypass breaker MBB and the internal maintenance breaker IMB* must be padlocked in the open position.

1. Connect signal cables from the breaker indicator lights in your switchgear to board 640-4864 terminal J6618 in the top of the UPS. If an external supply is used, remove jumper from J6618 pin 8 and 9.

NOTE: The breaker indicator light circuit is considered Class 2/SELV. Class 2/SELV circuits must be isolated from the primary circuitry. Do not connect any circuit to the breaker indicator light terminals unless it can be confirmed that the circuit is Class 2/SELV.



2. Connect signal cables from AUX switches in your switchgear to board 640-4843 in the top of the UPS.



		Non-SELV 640-4843	
J6601	○ 1 24V_LIMITED_13 ○ 2 UOB_AUX_RED	J6609	○ 1 24V_LIMITED_8 ○ 2 LBB_AUX ○ 3 24V_LIMITED_7 ○ 4 EUOB_AUX ○ 5 24V_LIMITED_6 ○ 6 UOB_AUX ○ 7 24V_LIMITED_5 ○ 8 SSIB_AUX
J6602	○ 1 24V_LIMITED_11 ○ 2 SIB_AUX ○ 3 24V_LIMITED_10 ○ 4 BB2_AUX ○ 5 24V_LIMITED_9 ○ 6 BB1_AUX	J6614	○ 1 24V_LIMITED_4 ○ 2 UIB_AUX ○ 3 24V_LIMITED_3 ○ 4 MBB_AUX ○ 5 24V_LIMITED_2 ○ 6 RIMB_AUX

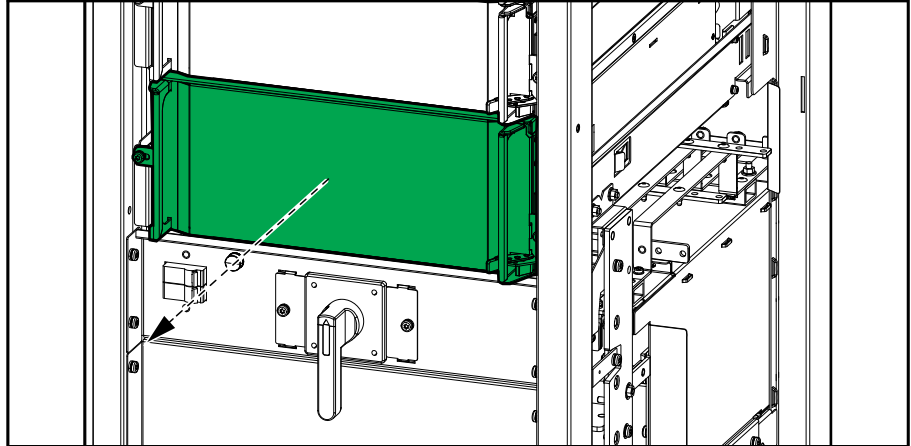
Terminal number	Function	Connection
J6601	UOB_RED (redundant AUX switch in unit output breaker)	Connect to redundant AUX switch in unit output breaker UOB.
J6602	SIB (system isolation breaker)	Connect to normally open (NO) AUX switch in system isolation breaker SIB for parallel system. SIB must contain an AUX switch for each connected UPS.
J6609	UOB (unit output breaker)	Connect to normally open (NO) AUX switch in unit output breaker UOB.
	SSIB (static switch input breaker)	Connect to normally open (NO) AUX switch in static switch input breaker SSIB. SSIB must contain an AUX switch for each connected UPS.
J6614	UIB (unit input breaker)	Connect to normally open (NO) AUX switch in unit input breaker UIB. UIB must contain an AUX switch for each connected UPS.
	MBB (maintenance bypass breaker)	Connect to normally closed (NC) AUX switch in maintenance bypass breaker MBB. MBB must contain an AUX switch for each connected UPS.

Connect the IMB Signal Cables in a Simplified 1+1 Parallel System

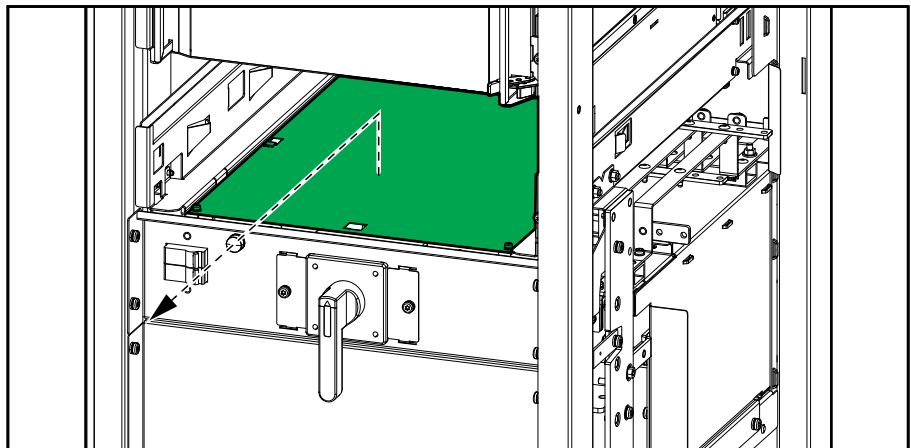
NOTE: Route the signal cables separately from the power cables to ensure sufficient isolation.

Use optional kit GVSOPT006 for this procedure.

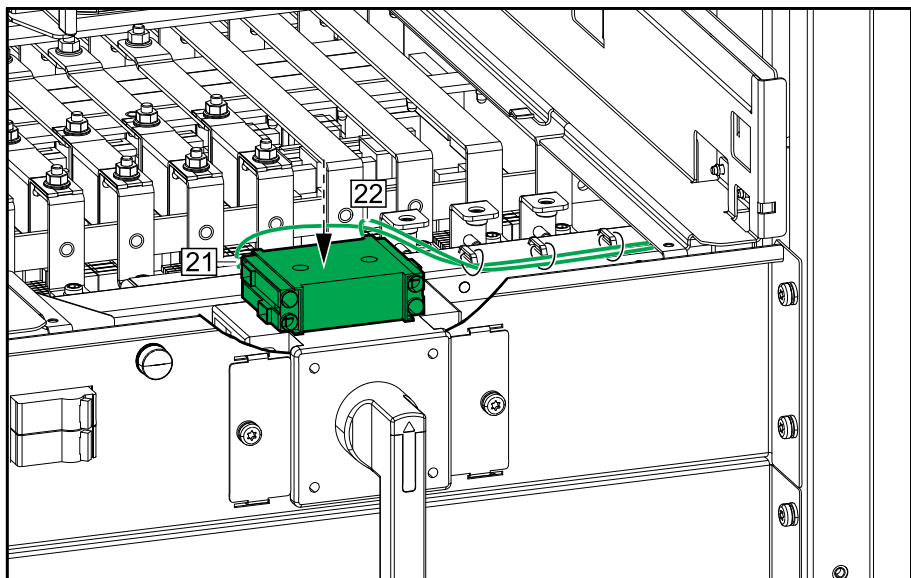
1. Remove the static switch module.



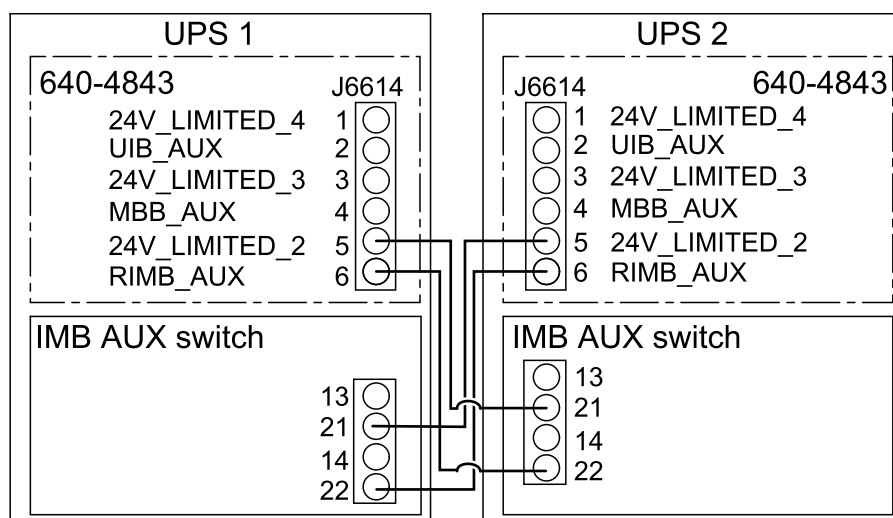
2. Remove the indicated plate.



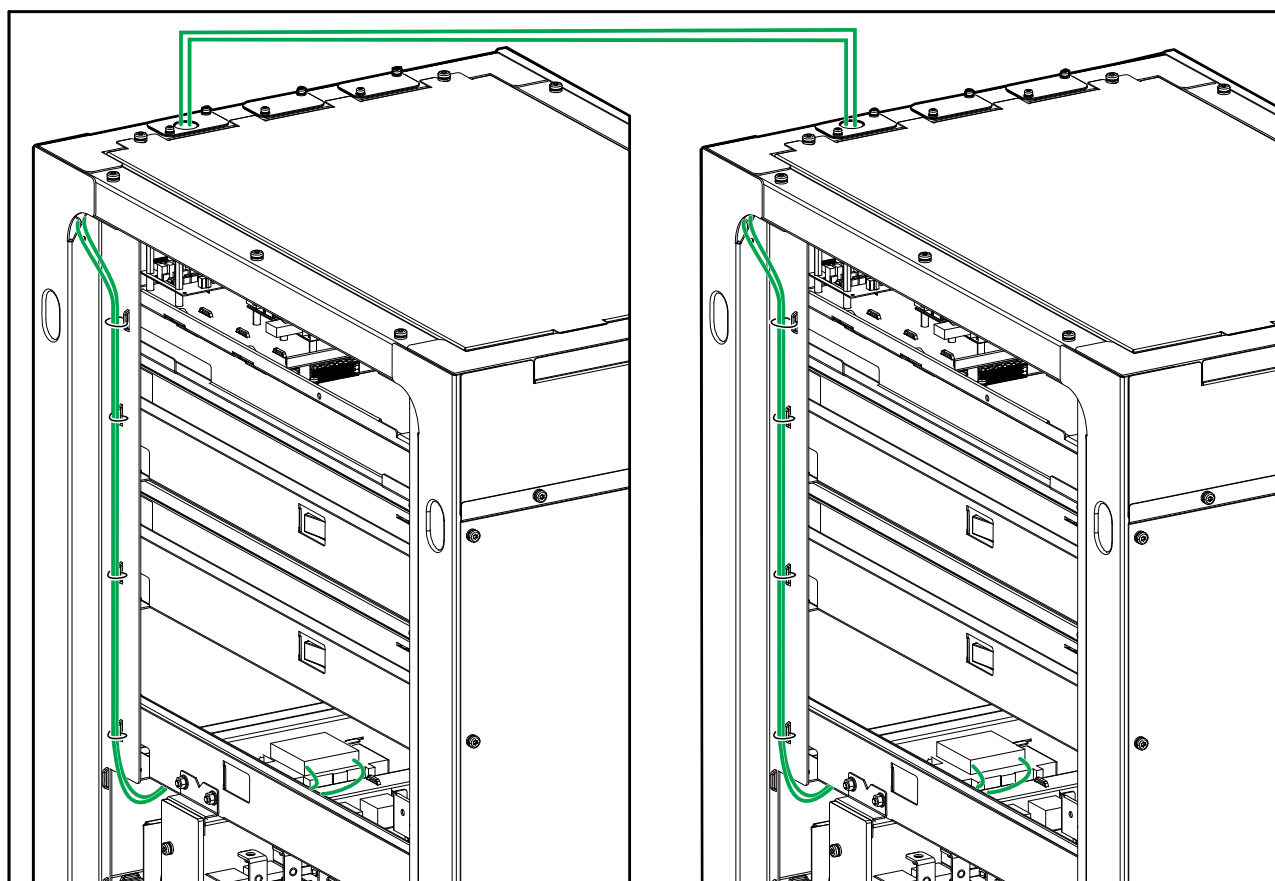
3. Install an additional AUX switch (provided) on the internal maintenance breaker IMB on both UPSs.



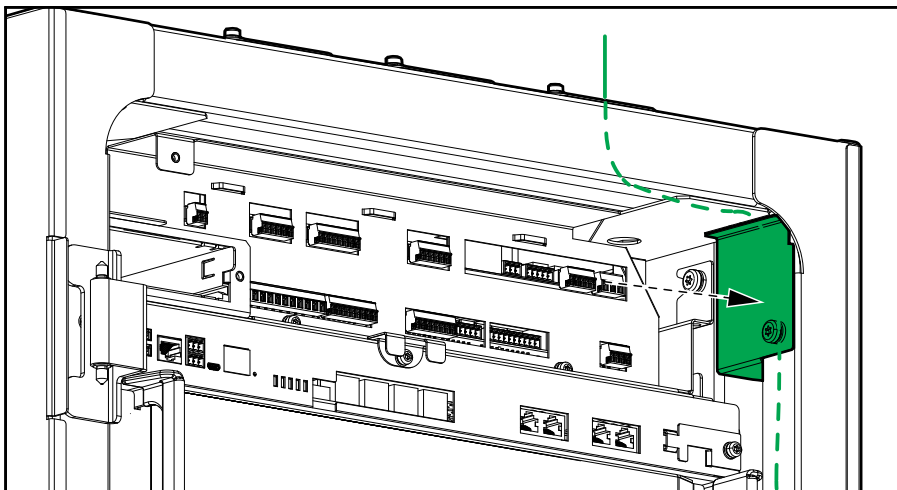
4. Connect the non-Class 2/non-SELV signal cables between the two UPSs.



Rear Right Side View of Simplified 1+1 Parallel System



5. Install the provided cover in the upper right corner.



6. Reinstall the plate and the static switch module.
7. Reinstall the right side panel.

Connect the PBUS Cables

⚠ CAUTION

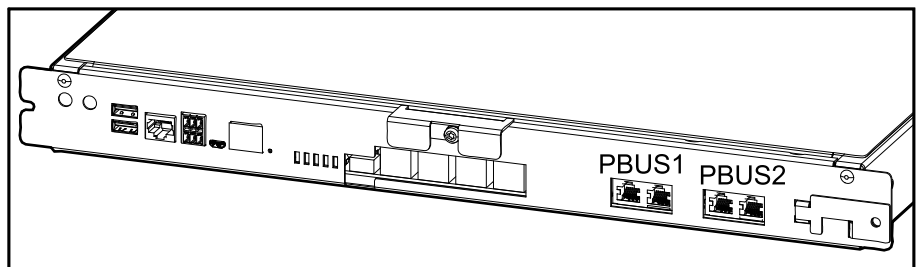
RISK OF EQUIPMENT DAMAGE

All PBUS cables shall be double insulated/jacket cable and minimum rated for 30 VDC. It is recommended to use the PBUS cables provided by Schneider Electric.

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

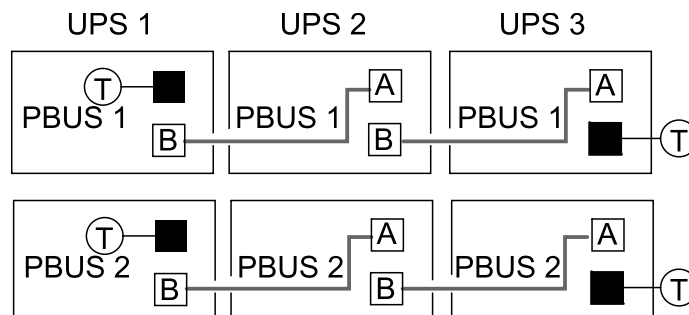
1. Connect the provided PBUS 1 (white) and PBUS 2 (red) cables to the PBUS ports in the UPS controller boxes. Route the PBUS cables through the cable channel in the UPSs.

Front View of Controller Box



2. Mount termination plugs (T) in the unused connectors.

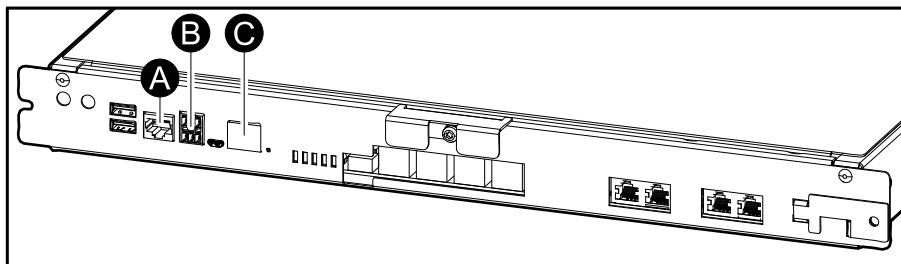
Example of System with Three UPSs in Parallel



Connect the External Communication Cables

1. Connect the external communication cables to the ports in the UPS controller box.

Front View of the Controller Box



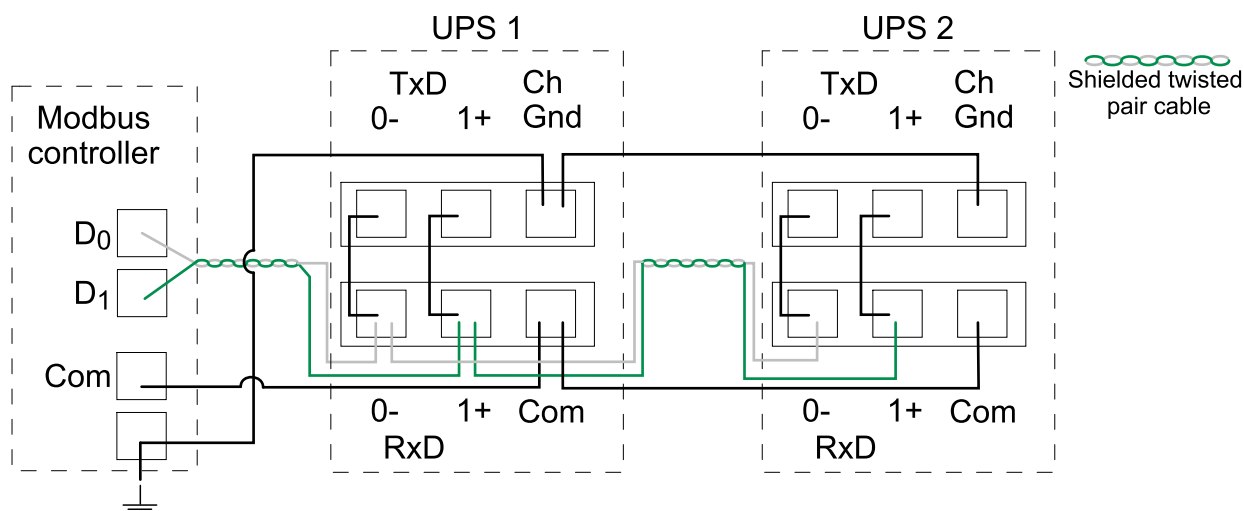
- A. Universal I/O port for built-in network management card.
- B. Modbus port for built-in network management card.
- C. Network port for built-in network management card. Use a shielded network cable.

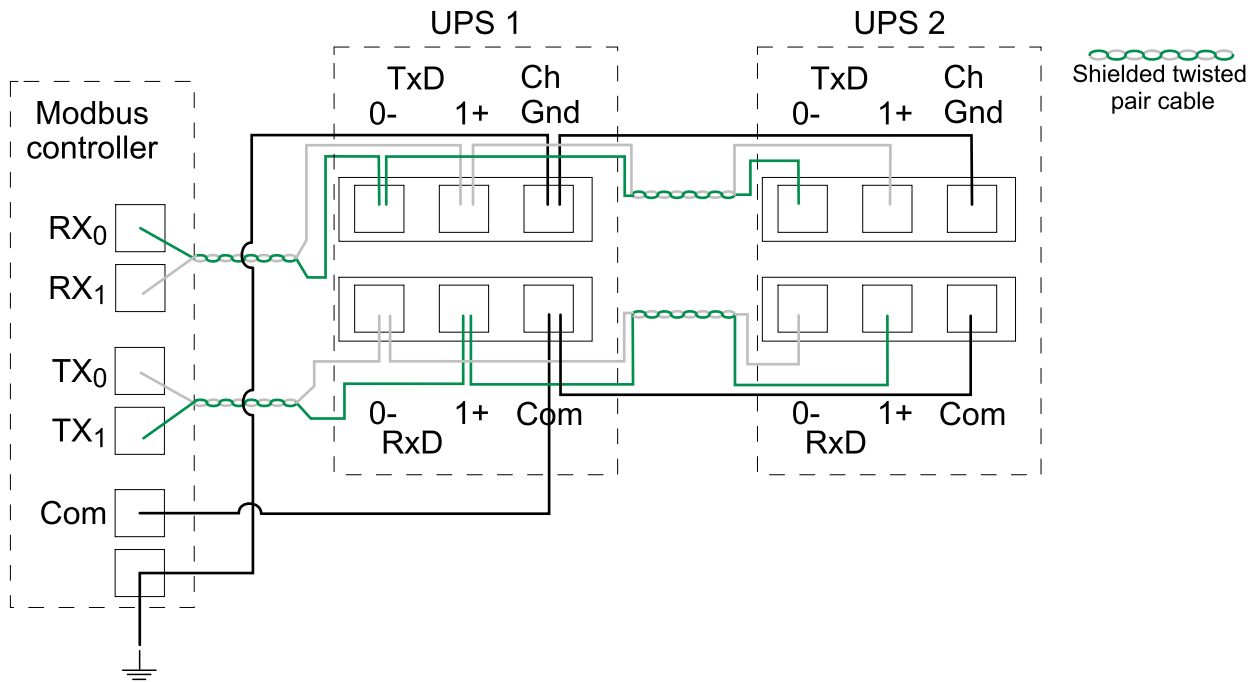
NOTE: Check that you are connecting to the correct port to avoid network communication conflicts.

Connect the Modbus Cables

1. Connect the Modbus cables to the UPS(s). Use either 2-wire or 4-wire connection.
 - All Modbus signal cables shall be double insulated/jacket cable and minimum rated for 30 VDC.
 - Shielded twisted pair cables must be used for Modbus connections. The shield connection to the ground must be as short as possible (ideally below 1 cm). The cable shield must be connected to the Ch Gnd pin on each device.
 - Wiring should be done in accordance with local wiring codes.
 - Route signal cables separately from power cables to ensure sufficient isolation.
 - The Modbus port is galvanically isolated with the Com pin as ground reference.

Example: 2-Wire Connection with Two UPSs



Example: 4-Wire Connection with Two UPSs

2. Install 150 Ohm termination resistors at each end of each bus if the buses are very long and operate at high data rates. Busses under 610 meters (2000 feet) at 9600 baud or under 305 meters (1000 feet) at 19.200 baud should not require termination resistors.

Add Translated Safety Labels to Your Product

The safety labels on your product are in English and French. Sheets with translated safety labels are provided with your product.

1. Find the sheets with translated safety labels provided with your product.
2. Check which 885-XXX numbers are on the sheet with translated safety labels.
3. Locate the safety labels on your product that match the translated safety labels on the sheet – look for the 885-XXX numbers.
4. Add the replacement safety label in your preferred language to your product on top of the existing French safety label.

Final Installation

⚡⚠ 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.

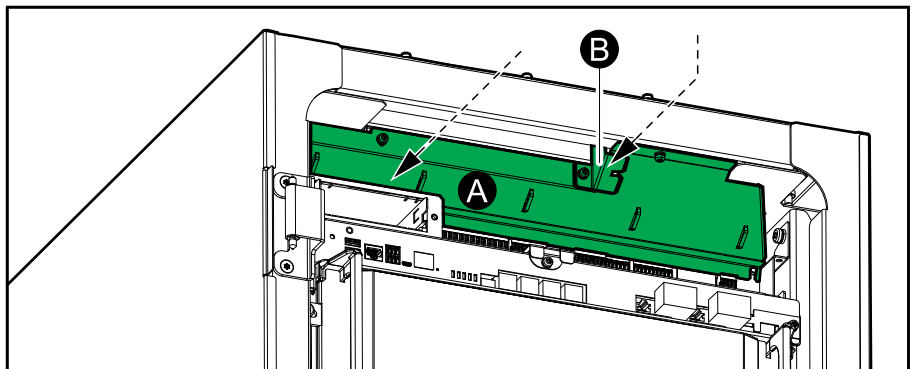
⚠ WARNING

RISK OF EQUIPMENT DAMAGE

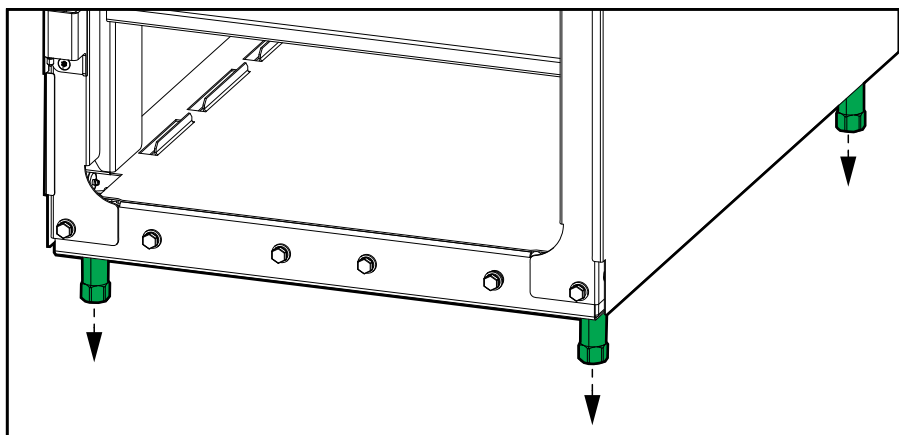
Wait until the system is ready to be powered up before installing batteries in the system. The time duration from battery installation until the UPS system is powered up must not exceed 72 hours or 3 days.

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

1. Reinstall the indicated covers (first A and then B). It may be necessary to disconnect the Class 2/SELV signal cables while fitting the covers in place. Fasten the Class 2/SELV signal cables to the bridges on the covers.



2. Lower the front and rear leveling feet on the UPS with a wrench until they connect with the floor. Use a bubble-leveler to check that the UPS is level.



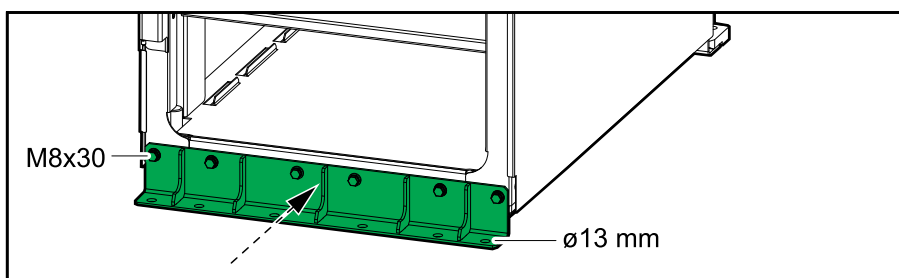
NOTICE

RISK OF EQUIPMENT DAMAGE

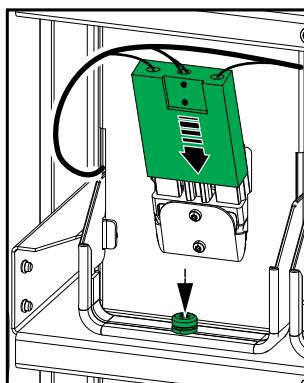
Do not move the cabinet after the leveling feet have been lowered.

Failure to follow these instructions can result in equipment damage.

3. **Only for seismic anchoring:** Mount the front anchoring bracket on the UPS and to the floor. Use appropriate hardware for the floor type – the hole diameter in the front anchoring bracket is $\varnothing 13$ mm. Minimum requirement is M12 grade 8.8 hardware.

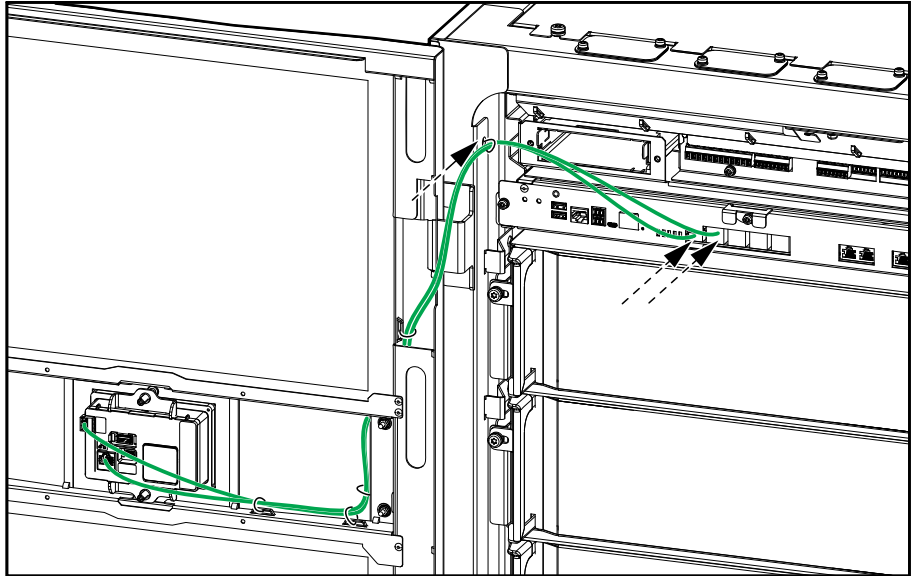


4. Set the battery breaker BB to the open (OFF) position.
5. Push the battery modules into the slot. Fill the shelves from the bottom and upwards. Always install a complete battery string (four battery modules) on each shelf.
6. Turn down the handle on the battery modules and fasten the handle to the shelf with the provided screw.
7. Connect the battery terminals to the front of the battery modules.



8. Reinstall the battery cover on the UPS.
9. Reinstall the front door.

10. Reconnect the two signal cables from the display. Fasten the signal cables with cable ties in the upper left corner.



Decommission or Move the UPS to a New Location

1. Shut down the UPS completely – follow the instructions in the UPS operation manual.
2. Lockout/Tagout the battery breaker BB to the open (OFF) position on the UPS.
3. Lockout/Tagout all breakers in the maintenance bypass cabinet/maintenance bypass panel/maintenance bypass panel/switchgear in the OFF (open) position.
4. Lockout/Tagout all battery breakers in the switchgear/battery solution in the OFF (open) position.
5. Open the front door of the UPS.
6. Lockout/Tagout the internal maintenance breaker IMB in the OFF (open) position.

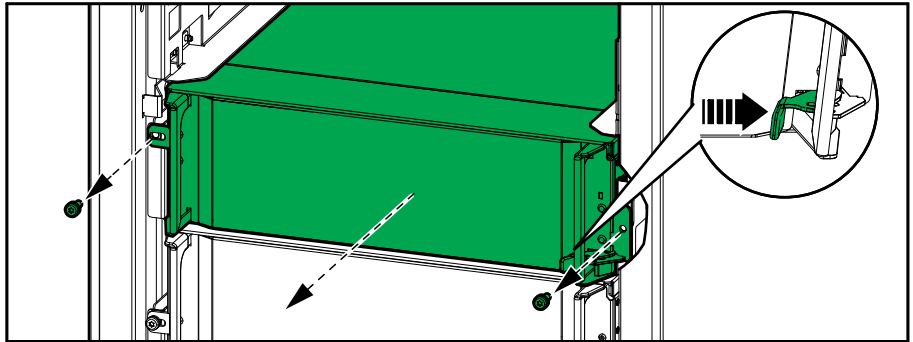
7. Remove the power modules from the UPS:

⚠ CAUTION**HEAVY LOAD**

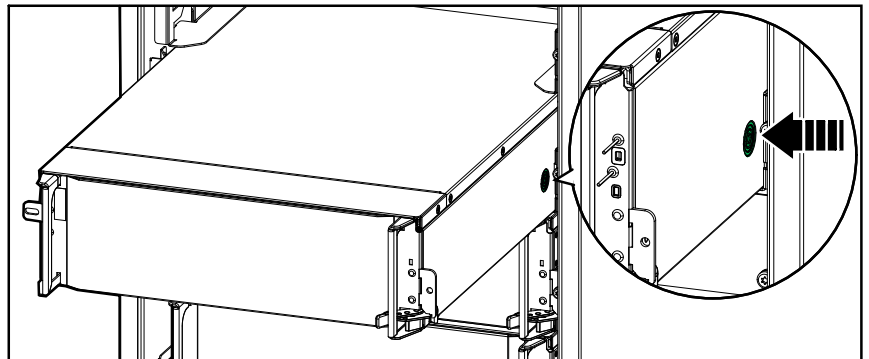
Power modules are heavy and require two persons to lift.

- 20 kW power module weighs 25 kg (55 lbs).
- 50 kW power module weighs 38 kg (84 lbs).

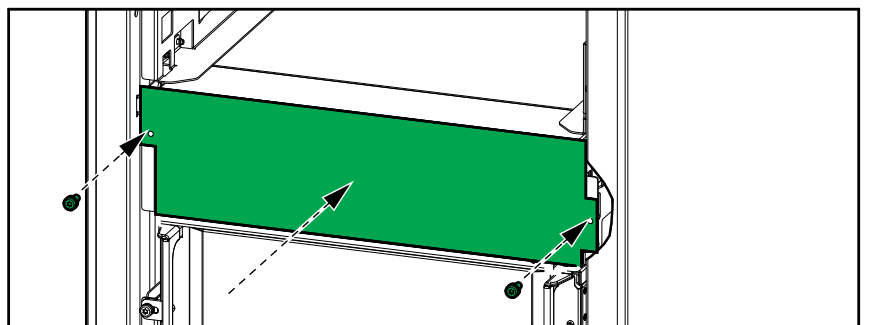
Failure to follow these instructions can result in injury or equipment damage.



- a. Pull the power module halfway out. A locking mechanism prevents the power module from being pulled all the way out.
- b. Release the lock by pressing the release button on both sides of the power module and remove the power module.



- c. Install a filler plate (if available) in front of the empty power module slot.



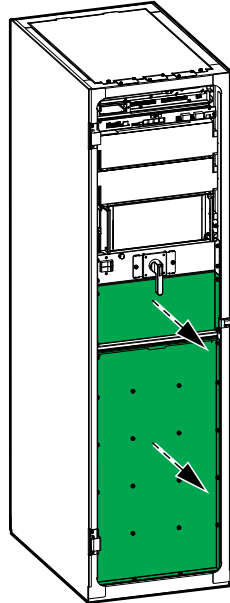
- d. Store the power modules safely until reinstallation.

⚠ WARNING**RISK OF EQUIPMENT DAMAGE**

- Store the power modules at an ambient temperature of -15 to 40 °C (5 to 104 °F), 10-80% non-condensing humidity.
- Store the power modules in their original protective packaging.

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

8. Remove the battery cover and the middle plate.



9. Disconnect the battery terminals from the front of all the battery modules.

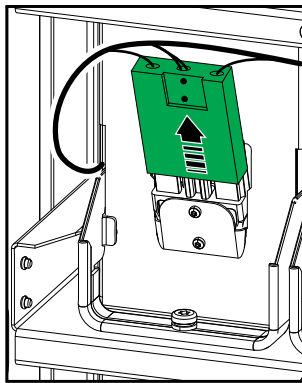
⚡ ⚠ DANGER

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:

- 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.
- 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.
- 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.
- Set the battery breaker BB to the open (OFF) position before starting this procedure.

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



10. Remove the battery modules from the three upper rows. Leave the battery modules in the two bottom rows to increase weight stability.

⚠ CAUTION

HEAVY LOAD

Battery modules are heavy and require two persons to lift.

- The battery module weighs 32 kg (71 lbs).

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

- Remove the screw from the battery module handle and turn the handle upwards.
- Pull the battery module carefully out of the slot.
- Store the battery modules correctly for reinstallation.

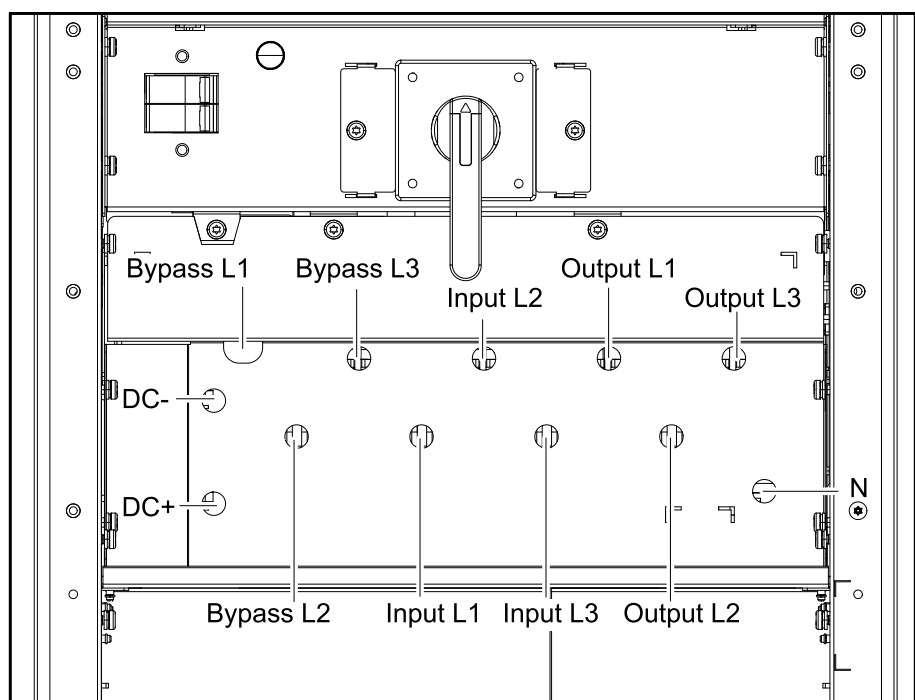
⚠ WARNING

RISK OF EQUIPMENT DAMAGE

- 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 installed battery modules, thus avoiding irreversible damage from deep discharging.
- Store the battery modules at an ambient temperature of -15 to 40 °C (5 to 104 °F).
- Store the battery modules in their original protective packaging.
- Battery modules stored at -15 to 25 °C (5 to 77 °F) must be recharged every six months to avoid damages from deep discharging. Battery modules stored at over 25 °C (77 °F) must be recharged at shorter intervals.

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

11. Measure for and verify ABSENCE of voltage with a multimeter probe through the holes in the transparent cover for input, bypass, output, neutral, and DC.



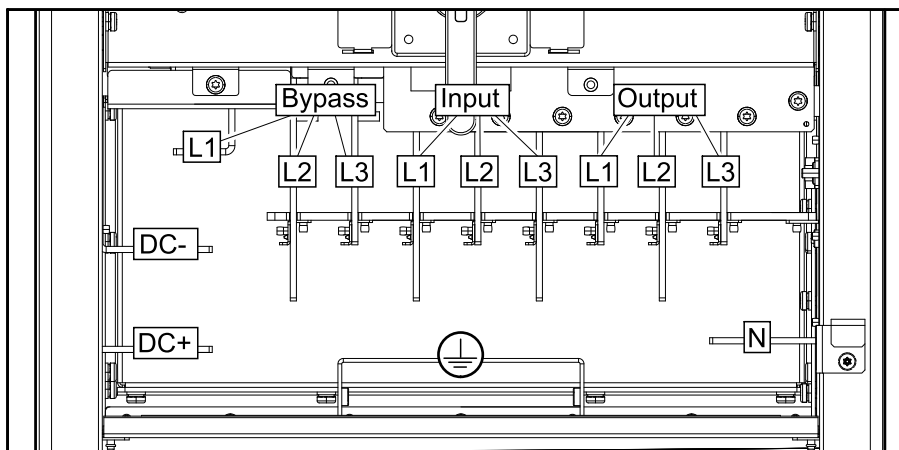
12. Remove the transparent cover.
13. Measure for and verify ABSENCE of voltage on each input/bypass/output terminal before continuing.

⚠️ DANGER

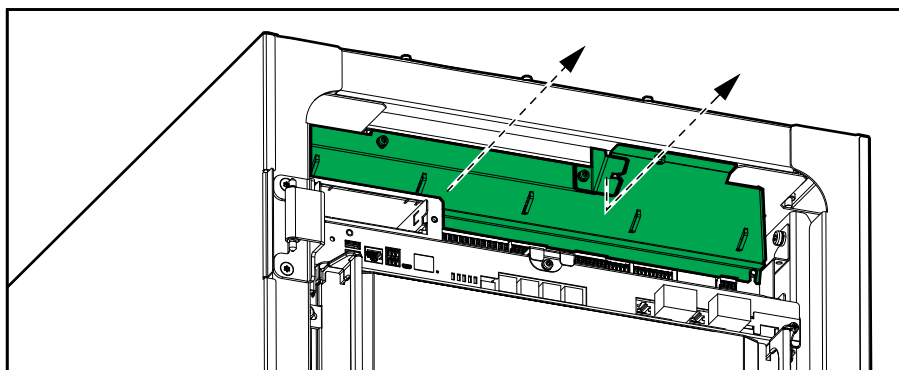
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Measure for and verify ABSENCE of voltage on each input/bypass/output terminal before continuing.

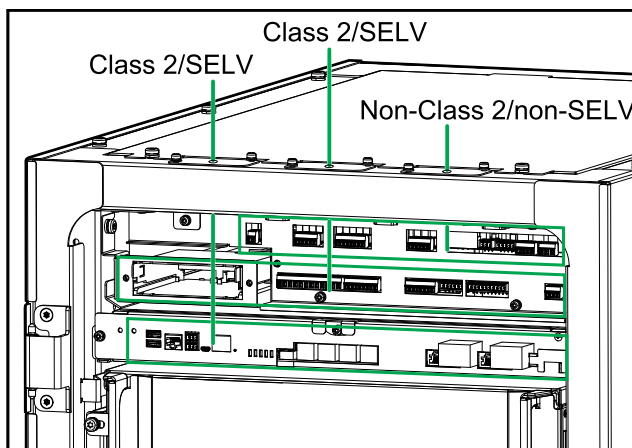
Failure to follow these instructions will result in death or serious injury.



14. Disconnect and remove all power cables from the UPS. See [Connect the Power Cables](#), page 59 for details.
15. **For UPS system with adjacent modular battery cabinet:** Disconnect and remove the DC extension busbars and the battery cables from the UPS. See [Connect the Power Cables from an Adjacent Modular Battery Cabinet](#), page 61 for details. Save the DC extension busbars and the battery cables for reinstallation.
16. Remove the indicated covers.



17. Disconnect and remove any signal cables from the front of the UPS. **For UPS system with modular battery cabinet(s):** See *Connect the Signal Cables from a Modular Battery Cabinet*, page 65 for details. **For simplified 1+1 parallel UPS system:** See *Connect the IMB Signal Cables in a Simplified 1+1 Parallel System*, page 70 for details.



18. **For UPS system with maintenance bypass cabinet:** Remove the interconnection hardware between the UPS and the maintenance bypass cabinet. See the installation manual provided with the maintenance bypass cabinet for details. Save all parts for reinstallation.
19. **For UPS with system adjacent modular battery cabinet:** Remove the interconnection hardware between the UPS and the adjacent battery cabinet. See the installation manual provided with the adjacent battery cabinet for details. Save all parts for reinstallation.
20. Reinstall all removed plates and covers. Close and lock the front door.
21. If present, remove the seismic front anchoring bracket from the UPS. Save for reinstallation.
22. Raise the feet of the UPS until the casters have full contact with the floor.
23. You can now move the UPS by rolling it over the floor on the casters.

⚠ WARNING

TIPPING HAZARD

- The casters of the UPS are exclusively for transport on flat, even, hard, and horizontal surfaces.
- The casters of the UPS are intended for transport over short distances (i.e. inside the same building).
- Move at a slow pace and pay close attention on the floor conditions and the balance of the UPS.

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

24. If present, remove the rear seismic anchoring bracket from the UPS and remove the seismic anchors from the floor. Save for reinstallation. See *Install the Seismic Anchoring (Option)*, page 52 for details.

25. **For transport over longer distances or in conditions that are not suitable for the casters of the UPS:**

⚠ WARNING
TIPPING HAZARD For transport over longer distances or in conditions that are not suitable for the casters of the UPS, ensure: • that personnel performing the transport have necessary skills and have received adequate training; • to use appropriate tools to safely lift and transport the UPS; • to protect the product against damage by using appropriate protection (like wrapping or packaging). Failure to follow these instructions can result in death, serious injury, or equipment damage.

Transportation requirements:

- Mount the UPS in a vertical position in the center of a suitable pallet with minimum pallet dimensions: 805 mm x 1060 mm (32 in x 42 in)). The pallet must be suitable for the weight of the UPS (496 kg (1094 lbs) with no power modules and two bottom rows of battery modules present inside the UPS).
- Use appropriate means of fixation to mount the UPS to the pallet.
- The original shipping pallet in combination with the original transportation brackets can be reused, if in undamaged condition.

⚠ DANGER
TIPPING HAZARD • The UPS must be appropriately fixed to the pallet immediately after being placed on the pallet. • The fixation hardware must be strong enough to withstand vibrations and shocks during loading, transport, and unloading. Failure to follow these instructions will result in death or serious injury.

⚠ WARNING
UNEXPECTED EQUIPMENT BEHAVIOR Do not lift the UPS with a forklift/pallet truck directly on the frame as it may bend or damage the frame. Failure to follow these instructions can result in death, serious injury, or equipment damage.

26. Perform one of the following:

- Decommission the UPS, OR
- Move the UPS to a new location to install it.

27. **Only for installing the UPS in a new location:** Follow the installation manual to install UPS in the new location. See Installation Procedure for Single Systems, page 49 or Installation Procedure for Parallel Systems, page 50 for installation overview. Startup must only be performed by Schneider Electric.

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

Startup must only be performed by Schneider Electric.

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

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

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