Galaxy VL

UPS

Installation

200-500 kW 380/400/415/440/480 V

Latest updates are available on the Schneider Electric website
10/2022

Legal Information

Find the manuals here:
Trouvez les manuels ici:
在这里找到手册
Hier finden Sie die Handbücher:
Encuentre los manuales aquí:
Encontre os manuais aqui:

IEC **UL**

IEC: *https://www.productinfo.schneider-electric.com/galaxyvl_iec/*
UL: *https://www.productinfo.schneider-electric.com/galaxyvl_ul/*

Table of Contents

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.

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.

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

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

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

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠WARNING

HAZARD OF ARC FLASH

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

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

NOTICE

RISK OF OVERHEATING

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

Failure to follow these instructions can result in equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

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

Failure to follow these instructions can result in equipment damage.

Additional Safety Precautions After Installation

⚠⚠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 this product has been installed, turn off the product and cover the product with the protective packaging bag the product was delivered in.

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

Electrical Safety

This manual contains important safety instructions that should be followed during the installation and maintenance of the UPS system.

⚠⚠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.
- Disconnection devices for AC and DC must be provided by others, be readily accessible, and the function of the disconnect device marked for its function.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

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

The label below must be added if:

1. The UPS input is connected through external isolators that, when opened, isolate the neutral, OR
2. The UPS input is connected via an IT power system.

The label must be placed adjacent to all upstream power disconnection devices that isolate the neutral.

The label below must be also added if backfeed protection is provided external to the equipment. See Backfeed Protection, page 86 for more details. The label must be placed adjacent to all upstream power disconnection devices.

⚠⚠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.

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.

NOTE: Always follow the battery manufacturer's installation manual for battery installation and maintenance instructions.

Specifications

Specifications for 200 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[1] (L1, L2, L3, N, G) or 3-wire[1] (L1, L2, L3, G) Dual mains: 3-wire[1] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	316	299	288	272	249
	Maximum input current (A)	364	359	346	326	298
	Input current limitation (A)	364	364	360	336	308
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	307	292	281	265	243
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

1. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[2]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[3])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[4]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[4]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	304	289	278	262	241
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 160 100% load: 30	0-40% load: 160 100% load: 40			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	434				
	Battery current at full load and minimum battery voltage (A)	543				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

2. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
3. Per NEC 250.30.
4. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 250 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[5] (L1, L2, L3, N, G) or 3-wire[5] (L1, L2, L3, G) Dual mains: 3-wire[5] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	395	374	360	340	311
	Maximum input current (A)	455	449	432	408	373
	Input current limitation (A)	455	455	450	420	385
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	384	364	351	331	304
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

5. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[6]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[7])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[8]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[8]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	380	361	348	328	301
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 200 100% load: 37.5	0-40% load: 200 100% load: 50			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	543				
	Battery current at full load and minimum battery voltage (A)	678				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

6. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
7. Per NEC 250.30.
8. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 300 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[9] (L1, L2, L3, N, G) or 3-wire[9] (L1, L2, L3, G) Dual mains: 3-wire[9] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	474	449	432	408	373
	Maximum input current (A)	546	539	519	490	447
	Input current limitation (A)	546	546	540	504	462
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	460	437	422	398	364
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

9. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[10]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[11])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[12]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[12]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	456	433	417	394	361
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 240 100% load: 45	0-40% load: 240 100% load: 60			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	651				
	Battery current at full load and minimum battery voltage (A)	814				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

10. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
11. Per NEC 250.30.
12. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 350 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[13] (L1, L2, L3, N, G) or 3-wire[13] (L1, L2, L3, G) Dual mains: 3-wire[13] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	553	524	505	476	435
	Maximum input current (A)	637	629	605	571	522
	Input current limitation (A)	637	637	630	588	539
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	537	510	492	464	425
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

13. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[14]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[15])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[16]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[16]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	532	505	487	459	421
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 280 100% load: 52.5	0-40% load: 280 100% load: 70			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	760				
	Battery current at full load and minimum battery voltage (A)	949				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

14. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
15. Per NEC 250.30.
16. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 400 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[17] (L1, L2, L3, N, G) or 3-wire[17] (L1, L2, L3, G) Dual mains: 3-wire[17] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	632	599	577	544	497
	Maximum input current (A)	728	719	692	653	596
	Input current limitation (A)	728	728	720	672	616
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	614	583	562	530	486
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

17. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[18]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[19])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[20]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[20]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	608	577	556	525	481
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 320 100% load: 60	0-40% load: 320 100% load: 80			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	868				
	Battery current at full load and minimum battery voltage (A)	1085				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

18. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
19. Per NEC 250.30.
20. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 450 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[21] (L1, L2, L3, N, G) or 3-wire[21] (L1, L2, L3, G) Dual mains: 3-wire[21] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	711	674	649	612	559
	Maximum input current (A)	819	809	778	734	671
	Input current limitation (A)	819	819	810	756	693
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	691	656	632	596	547
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

21. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[22]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[23])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[24]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[24]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	684	650	626	590	541
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 360 100% load: 67.5	0-40% load: 360 100% load: 90			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	977				
	Battery current at full load and minimum battery voltage (A)	1221				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

22. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
23. Per NEC 250.30.
24. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Specifications for 500 kW UPS

	Voltage (V)	380	400	415	440	480
Input	Connections	Single mains: 4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE) Dual mains: 3-wire (L1, L2, L3, PE)				Single mains: 4-wire[25] (L1, L2, L3, N, G) or 3-wire[25] (L1, L2, L3, G) Dual mains: 3-wire[25] (L1, L2, L3, G)
	Input voltage range (V)	331-437	340-460	353-477	374-506	408-552
	Frequency (Hz)	40-70				
	Nominal input current (A)	790	749	721	680	621
	Maximum input current (A)	910	898	865	816	746
	Input current limitation (A)	910	910	900	840	770
	Total harmonic distortion (THDI)	<3% at 100% load				
	Input power factor	>0.99 at load >25%, 0.95 at >15% load				
	Protection	Built-in backfeed protection and fuses				
	Ramp-in	Adaptive 1-300 seconds				
Bypass	Connections	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G)
	Bypass voltage range (V)	342-418	360-440	374-457	396-484	432-528
	Frequency (Hz)	50 or 60				
	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.				
	Nominal bypass current (A)	767	729	703	663	607
	Maximum input short circuit level (three cycles)	65 kA Icw 25 kA Icw with maintenance bypass cabinet 45 kA Icw with bottom entry cabinet 45 kA Icc with backfeed breaker kit installed in the UPS				65 kAIC 65 kAIC with maintenance bypass cabinet 45 kAIC with bottom entry cabinet 45 kAIC with backfeed breaker kit installed in the UPS
	I^2t thyristor value (A^2s)	3.1 MA^2s				
	Bypass backfeed protection options	1: Upstream installation of breaker with shunt trip connected to the UPS, OR 2: Installation with maintenance bypass cabinet, OR 3: Installation of backfeed breaker kit in the UPS.				

25. WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not supported.

	Voltage (V)	380	400	415	440	480
Output	Connections[26]	4-wire (L1, L2, L3, N, PE) or 3-wire (L1, L2, L3, PE)				4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC[27])
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%				
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[28]) Battery operation: 125% for 1 minute Bypass operation: 110% continuous, 1600% for 100 milliseconds				Normal operation: 150% for 1 minute, 125% for 10 minutes, (110% continuous[28]) Battery operation: 125% for 1 minute Bypass operation: 125% continuous, 1600% for 100 milliseconds
	Dynamic load response	± 5% after 2 ms, ± 1% after 50 ms				
	Output power factor	1				
	Nominal output current (A)	760	722	696	656	601
	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (free-running)				
	Synchronized slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6				
	Total harmonic distortion (THDU)	<1% for linear load, <5% for non-linear load				
	Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111				
	Load crest factor	3				
	Load power factor	0.5 leading to 0.5 lagging without derating				
Battery	Charging power in % of output power	0-40% load: 80% 100% load: 15%	0-40% load: 80% 100% load: 20%			
	Maximum charging power (kW)	0-40% load: 400 100% load: 75	0-40% load: 400 100% load: 100			
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks				
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks				
	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks				
	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				
	End of discharge voltage (no load) (VDC)	420				
	Battery current at full load and nominal battery voltage (A)	1085				
	Battery current at full load and minimum battery voltage (A)	1356				
	Ripple current	< 5% C20 (5 minute runtime)				
	Battery test	Manual/automatic (selectable)				
	Maximum short circuit rating	30 kA				

NOTE: Battery specifications are based on VRLA batteries.

26. The number of output connections must match the number of input connections in a single mains system or the number of bypass connections in a dual mains system.
27. Per NEC 250.30.
28. 110% continuous overload in normal operation at nominal mains voltage and at maximum 40 °C (104 °F) ambient temperature. Contact Schneider Electric to enable this function.

Upstream and Downstream Protection for IEC

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Circuit breakers must have instantaneous trip time of maximum 60 ms.
- Circuit breakers must have instantaneous override values set according to the table below.
- Circuit breakers must be installed for input (unit input breaker UIB) and bypass (static switch input breaker SSIB).
- For parallel system with three or more UPSs: Circuit breakers must be installed for the output (unit output breaker UOB) of each UPS. The unit output breaker (UOB) is sized as the static switch input breaker (SSIB).
- Live Swap is not supported for >65kA_{bf} installations where current limiting disconnect devices are used to protect the UPS.

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

Schneider Electric reserves the right to remove the Live Swap label from the product front if the conditions are not met.

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.

The bypass/output breakers are sized for low grid voltage UN -10%. The battery breakers are sized and trimmed for kW rating at end of discharge voltage but does not necessarily offer overload protection as the cables are sized for kW rating at end of discharge voltage in accordance with IEC 60364 433.3 Omission of devices for protection against overload.

Recommended Upstream Protection for IEC

UPS rating	**200 kW**								
	Input				**Bypass/Output**				**Battery**
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380-440**
Breaker type	ComPacT NSX 400H MicroLogic 2.0 (3P: C4032D400, 4P: C4042D400)								ComPacT NS 630S DC TM-D (C634TM630D)
In/trip unit	400	400	400	400	400	400	400	400	360
Io	400	360	360	360	360	360	320	320	–
Ir setting	0.92	1	0.97	0.94	0.95	0.9	0.98	0.93	0.9
Ir	368	360	349	338	342	324	314	298	567
Isd	<10 x Ir	<10 x Ir	<10 x Ir	<10 x Ir	10 x Ir	10 x Ir	10 x Ir	10 x Ir	<10 x Ir

UPS rating	**250 kW**								
	Input				**Bypass/Output**				**Battery**
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380-440**
Breaker type	ComPacT NSX 630H MicroLogic 2.0 (3P: C6332D630, 4P: C6342D630)						ComPacT NSX 400H MicroLogic 2.0 (3P: C4032D400, 4P: C4042D400)		MasterPacT NW10HDC-D MicroLogic 1.0 DC (48649+65272)
In/trip unit	630	630	630	630	630	630	400	400	1000
Io	500	450	450	450	450	450	400	400	–
Ir setting	0.92	1	0.97	0.94	0.95	0.9	0.98	0.93	–

UPS rating	250 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Ir	460	450	436	423	428	405	392	372	1000
Isd	<10 x Ir	<10 x Ir	<10 x Ir	<10 x Ir	10 x Ir	10 x Ir	10 x Ir	10 x Ir	1500

UPS rating	300 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Breaker type	ComPacT NSX 630H MicroLogic 2.0 (3P: C6332D630, 4P: C6342D630)								MasterPacT NW10HDC-D MicroLogic 1.0 DC (48649+65272)
In/trip unit	630	630	630	630	630	630	630	630	1000
Io	570	570	570	570	570	500	500	450	–
Ir setting	0.96	0.95	0.92	0.9	0.9	0.98	0.94	1	–
Ir	547	542	524	513	513	490	470	450	1000
Isd	<10 x Ir	<10 x Ir	<10 x Ir	<10 x Ir	10 x Ir	10 x Ir	10 x Ir	10 x Ir	<10 x Ir

UPS rating	350 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Breaker type	ComPacT NS800H MicroLogic 5.0 (3P: 33553, 4P: 33556)	ComPacT NSX 630H MicroLogic 2.0 (3P: C6332D630, 4P: C6342D630)							MasterPacT NW10HDC-D MicroLogic 1.0 DC (48649+65272)
In/trip unit	800	630	630	630	630	630	630	630	1000
Io	–	630	630	630	630	570	570	570	–
Ir setting	0.8	1	0.97	0.94	0.95	1	0.96	0.92	–
Ir	640	630	611	592	598	570	547	524	1000
Isd/ii[29]	<10 x Ir	<10 x Ir	<10 x Ir	<10 x Ir	10 x Ir	10 x Ir	10 x Ir	10 x Ir	<10 x Ir

UPS rating	400 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Breaker type	ComPacT NS800H MicroLogic 5.0 (3P: 33553, 4P: 33556)						ComPacT NSX 630H MicroLogic 2.0 (3P: C6332D630, 4P: C6342D630)		MasterPacT NW20HDC-D MicroLogic 1.0 DC (48652+65273)
In/trip unit	800	800	800	800	800	800	630	630	2000
Io	–	–	–	–	–	–	630	630	–
Ir setting	0.95	0.9	0.9	0.9	0.9	0.9	1	0.94	–
Ir	760	720	720	720	720	720	630	592	2000
Isd/ii[29]	<10 x In	<10 x In	<10 x In	<10 x In	10 x In	10 x In	10 x Ir	10 x Ir	<10 x Ir

29. Only applicable for MicroLogic 5.0.

UPS rating	450 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Breaker type	ComPacT NS1000H MicroLogic 5.0 (3P: 33559, 4P: 33562)		ComPacT NS800H MicroLogic 5.0 (3P: 33553, 4P: 33556)		ComPacT NS800H MicroLogic 5.0 (3P: 33553, 4P: 33556)				MasterPacT NW20HDC-D MicroLogic 1.0 DC (48652+65273)
In/trip unit	1000	1000	800	800	800	800	800	800	2000
Io	–	–	–	–	–	–	–	–	–
Ir setting	0.9	0.9	0.98	0.95	0.98	0.95	0.9	0.9	–
Ir	900	900	784	760	784	760	720	720	2000
Isd/ii[30]	<8 x In	<8 x In	<10 x In	<10 x In	10 x In	10 x In	10 x In	10 x In	2500

UPS rating	500 kW								
	Input				Bypass/Output				Battery
Voltage (V)	380	400	415	440	380	400	415	440	380-440
Breaker type	ComPacT NS1000H MicroLogic 5.0 (3P: 33559, 4P: 33562)						ComPacT NS800H MicroLogic 5.0 (3P: 33553, 4P: 33556)		MasterPacT NW20HDC-D MicroLogic 1.0 DC (48652+65273)
In/trip unit	1000	1000	1000	1000	1000	1000	800	800	2000
Io	–	–	–	–	–	–	–	–	–
Ir setting	0.95	0.9	0.9	0.9	0.9	0.9	0.98	0.95	–
Ir	950	900	900	900	900	900	784	760	2000
Isd/ii[30]	<8 x In	<8 x In	<8 x In	<8 x In	8 x In	8 x In	10 x In	10 x In	2500

Recommended Downstream Protection for Distribution Circuit Breakers for IEC

NOTE: The recommended downstream protection for distribution circuit breakers is sized for protection of the SCRs in the static bypass switch and for coordination with the unit input breaker (UIB)/static switch input breaker (SSIB) when external backfeed protection is used.

UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
Breaker type	NSX160		NSX250			NSX400	
Trip module type	TM-D or Micrologic		TM-D or Micrologic			Micrologic	
In/trip module rating	≤160		≤250			≤400	

30. Only applicable for MicroLogic 5.0.

Recommended Cable Sizes for IEC

⚠⚠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 240 mm^2.
- Shrink sleeve must be fitted over cable lug crimped zone and must overlap with the cable insulation on all power cables.

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

The maximum number of cable connections per busbar:

- 4 on input/output/bypass busbars
- 4 x 240 mm^2 on input/output/bypass busbars
- 4 x 240 mm^2 or 8 x 150 mm^2 on DC+/DC- busbars
- 8 on N busbar
- 16 on PE busbar

NOTE: Overcurrent protection is to be provided by others.

Cable sizes in this manual are based on the minimum requirements in table B.52.3 and table B.52.5 of IEC 60364-5-52 with the following assertions[31]:

- 90 °C conductors
- An ambient temperature of 30 °C
- Use of copper or aluminum conductors
- Installation method F
- Single layer on a perforated cable tray

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.

The DC cables are sized for the kW rating at end of discharge voltage and not the upstream breaker in accordance with IEC 60364 433.3 Omission of devices for protection against overload.

Copper

UPS rating	**200 kW**				**250 kW**			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	1 x 150	1 x 150
Input PE (mm^2)	1 x 70	1 x 70	1 x 70	1 x 70	1 x 95	1 x 95	1 x 95	1 x 95
Bypass/output phases (mm^2)	1 x 120	1 x 95	1 x 95	1 x 95	1 x 150	1 x 150	1 x 150	1 x 120
Bypass PE/output PE (mm^2)	1 x 70	1 x 50	1 x 50	1 x 50	1 x 95	1 x 95	1 x 95	1 x 70
Neutral (mm^2)	1 x 120	1 x 95	1 x 95	1 x 95	1 x 150	1 x 150	1 x 150	1 x 120
DC+/DC- (mm^2)	1 x 185				1 x 240			
DC PE (mm^2)	1 x 95				1 x 120			
Inverter midpoint cable for 3-wire parallel (mm^2)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 185	1 x 185	1 x 150	1 x 150

31. Using non-recommended cable sizes will affect the eConversion limits for parallel UPS systems. For this installation scenario, refer to the table: Standard eConversion Limits Based on Non-recommended Cable Sizes, page 33

Copper

UPS rating	300 kW				350 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	1 x 240	1 x 240	1 x 240	1 x 240	2 x 120	2 x 120	2 x 120	1 x 240
Input PE (mm^2)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 120	1 x 120	1 x 120	1 x 120
Bypass/output phases (mm^2)	1 x 240	1 x 185	1 x 185	1 x 185	1 x 240	1 x 240	1 x 240	1 x 240
Bypass PE/output PE (mm^2)	1 x 120	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 120	1 x 120
Neutral (mm^2)	1 x 240	1 x 185	1 x 185	1 x 185	1 x 240	1 x 240	1 x 240	1 x 240
DC+/DC- (mm^2)	2 x 150				2 x 185			
DC PE (mm^2)	1 x 150				1 x 185			
Inverter midpoint cable for 3-wire parallel (mm^2)	1 x 240	1 x 240	1 x 240	1 x 240	2 x 120	2 x 120	2 x 120	1 x 240

Copper

UPS rating	400 kW				450 kW				500 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	2 x 150	2 x 150	2 x 150	2 x 150	2 x 240	2 x 240	2 x 185	2 x 150	2 x 240	2 x 240	2 x 240	2 x 240
Input PE (mm^2)	1 x 150	1 x 150	1 x 150	1 x 150	1 x 240	1 x 240	1 x 185	1 x 150	1 x 240	1 x 240	1 x 240	1 x 240
Bypass/output phases (mm^2)	2 x 150	2 x 150	2 x 120	1 x 240	2 x 185	2 x 150	2 x 150	2 x 150	2 x 240	2 x 240	2 x 185	2 x 150
Bypass PE/output PE (mm^2)	1 x 150	1 x 150	1 x 120	1 x 120	1 x 185	1 x 150	1 x 150	1 x 150	1 x 240	1 x 240	1 x 185	1 x 150
Neutral (mm^2)	2 x 150	2 x 150	2 x 120	1 x 240	2 x 185	2 x 150	2 x 150	2 x 150	2 x 240	2 x 240	2 x 185	2 x 150
DC+/DC- (mm^2)	2 x 240				3 x 150				3 x 185			
DC PE (mm^2)	1 x 240				2 x 120				2 x 150			
Inverter midpoint cable for 3-wire parallel (mm^2)	2 x 150	2 x 150	2 x 150	2 x 150	2 x 240	2 x 240	2 x 185	2 x 150	2 x 240	2 x 240	2 x 240	2 x 240

Aluminum

UPS rating	200 kW				250 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	1 x 185	1 x 185	1 x 185	1 x 150	1 x 240	1 x 240	1 x 240	1 x 240
Input PE (mm^2)	1 x 95	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 120	1 x 120
Bypass/output phases (mm^2)	1 x 150	1 x 150	1 x 150	1 x 150	1 x 240	1 x 240	1 x 185	1 x 185
Bypass PE/output PE (mm^2)	1 x 95	1 x 95	1 x 95	1 x 95	1 x 120	1 x 120	1 x 95	1 x 95
Neutral (mm^2)	1 x 150	1 x 150	1 x 150	1 x 150	1 x 240	1 x 240	1 x 185	1 x 185
DC+/DC- (mm^2)	2 x 120				2 x 150			
DC PE (mm^2)	1 x 120				1 x 150			
Inverter midpoint cable for 3-wire parallel (mm^2)	1 x 185	1 x 185	1 x 185	1 x 150	1 x 240	1 x 240	1 x 240	1 x 240

Aluminum

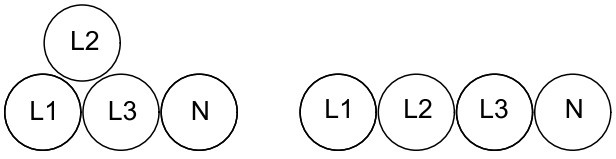
UPS rating	300 kW				350 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	2 x 150	2 x 150	2 x 150	2 x 120	2 x 185	2 x 185	2 x 185	2 x 150
Input PE (mm^2)	1 x 150	1 x 150	1 x 150	1 x 120	1 x 185	1 x 185	1 x 185	1 x 150
Bypass/output phases (mm^2)	2 x 120	2 x 120	1 x 240	1 x 240	2 x 150	2 x 150	2 x 150	2 x 150
Bypass PE/output PE (mm^2)	1 x 120	1 x 120	1 x 120	1 x 120	1 x 150	1 x 150	1 x 150	1 x 150
Neutral (mm^2)	2 x 120	2 x 120	1 x 240	1 x 240	2 x 150	2 x 150	2 x 150	2 x 150
DC+/DC- (mm^2)	2 x 240				3 x 150			
DC PE (mm^2)	1 x 240				2 x 120			
Inverter midpoint cable for 3-wire parallel (mm^2)	2 x 150	2 x 150	2 x 150	2 x 120	2 x 185	2 x 185	2 x 185	2 x 150

Aluminum

UPS rating	400 kW				450 kW				500 kW			
Voltage (V)	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**	**380**	**400**	**415**	**440**
Input phases (mm^2)	2 x 240	2 x 240	2 x 240	2 x 240	(3 x 185)[32]	(3 x 185)[32]	2 x 240	2 x 240	(3 x 185)[32]	(3 x 185)[32]	(3 x 185)[32]	(3 x 185)[32]
Input PE (mm^2)	1 x 240	1 x 240	1 x 240	1 x 240	2 x 150	2 x 150	1 x 240	1 x 240	2 x 150	2 x 150	2 x 150	2 x 150
Bypass/output phases (mm^2)	2 x 240	2 x 240	2 x 185	2 x 150	2 x 240	2 x 240	2 x 240	2 x 240	(3 x 185)[32]	(3 x 185)[32]	2 x 240	2 x 240
Bypass PE/output PE (mm^2)	1 x 240	1 x 240	1 x 185	1 x 150	1 x 240	1 x 240	1 x 240	1 x 240	2 x 150	2 x 150	1 x 240	1 x 240
Neutral (mm^2)	2 x 240	2 x 240	2 x 185	2 x 150	2 x 240	2 x 240	2 x 240	2 x 240	(3 x 185)[32]	(3 x 185)[32]	2 x 240	2 x 240
DC+/DC- (mm^2)	3 x 185				3 x 240				4x185			
DC PE (mm^2)	2 x 150				2 x 185				2 x 185			
Inverter midpoint cable for 3-wire parallel (mm^2)	2 x 240	2 x 240	2 x 240	2 x 240	(3 x 185)	(3 x 185)	2 x 240	2 x 240	(3 x 185)	(3 x 185)	(3 x 185)	(3 x 185)

Guidance for Organizing Input, Bypass, And Output Cables

The input, bypass, and output cables must be grouped in circuits. On raceways, use one of the two shown cable formations.

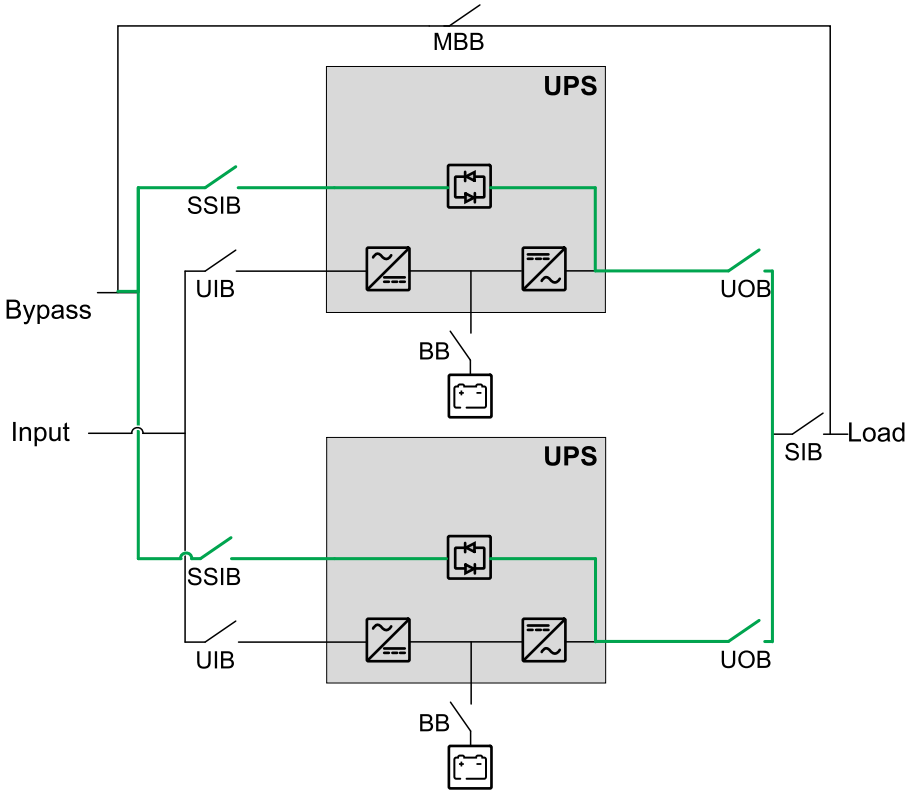


32. For parallel UPS systems, you must refer to this table: Standard eConversion Limits Based on Non-recommended Cable Sizes, page 33.

Load Sharing in Bypass Operation in a Parallel System

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

Parallel System – Dual Mains



NOTICE

RISK OF EQUIPMENT DAMAGE

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

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

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

Failure to follow these instructions can result in equipment damage.

eConversion Limits for Parallel UPS Systems

eConversion requires a minimum load percentage on the UPS for parallel UPS systems. The minimum required load percentages depend on the power cable sizes.

NOTE: For installations using the recommended cable sizes, refer to this table for the minimum load percentages: Standard eConversion Limits Based on Recommended Cable Sizes, page 33.

Standard eConversion Limits Based on Recommended Cable Sizes

UPS rating	Minimum load %
200 kW	34%
250 kW	27%
300 kW	23%
350 kW	19%
400 kW	17%
450 kW	15%
500 kW	14%

The other prerequisites to use this table include:

- The values are calculated based on the use of recommended cable sizes.
- Installations with maximum two cables on each phase are supported.
- The bypass and output cables must have equal length for all UPSs.

NOTE: For certain installations such as installations with 80% breakers or where other installation methods have been applied to comply with the IEC standard, it is possible that non-recommended cable sizes will be used. For installations using non-recommended cable sizes, refer to this table for the voltage rating percentages: Standard eConversion Limits Based on Non-recommended Cable Sizes, page 33.

Standard eConversion Limits Based on Non-recommended Cable Sizes

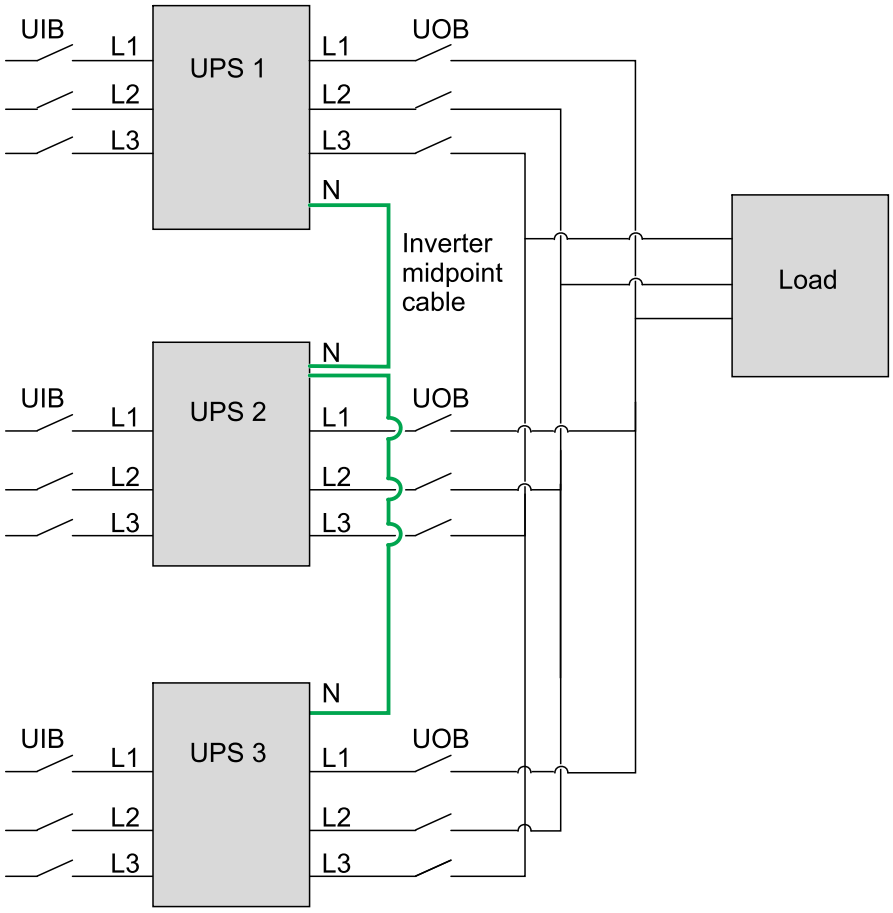
UPS rating	Minimum load %
200 kW	50%
250 kW	40%
300 kW	34%
350 kW	29%
400 kW	25%
450 kW	22%
500 kW	20%

The other prerequisites to use this table include:

- The values are calculated based on the scenario of using non-recommended cable sizes.
- Installations with three or four cables on each phase are supported.
- The bypass and output cables must have equal length for all UPSs.

For 3-Wire Parallel Systems Only

In a parallel installation installed as a 3-wire AC configuration, the inverter midpoint of each UPS must be interconnected by cable in a daisy chain configuration. The inverter midpoint cable size can be found in the recommended cable sizes table.



When the inverter midpoint of the parallel UPSs is permanently connected, there is still potentially dangerous voltage present on the neutral busbar inside the UPS even after the UPS has been isolated from the parallel system for maintenance and has been completely shut down. Due to the dangerous voltages on the neutral busbar, all service activities that need access inside the I/O section by opening the inner door require full shutdown of the entire parallel system and transfer to maintenance bypass.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Hard-wired inverter midpoint between the UPS systems is energized even when the UPS is isolated from the parallel system and completely shut down.
- Even if absence of voltage is measured, there can still be dangerous voltage transients on the neutral busbar.
- Entering the I/O terminal area requires full shutdown or the entire parallel system and transfer to maintenance bypass.

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

NOTE: For 3-wire parallel systems that have neutral available from the input source, the parallel system can be installed as a 4-wire AC configuration, which does not require the inverter midpoint connection between each UPS. Contact Schneider Electric for more details.

Upstream and Downstream Protection for UL

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Circuit breakers must have instantaneous trip time of maximum 50 ms.
- Circuit breakers must have instantaneous override values set according to the table below.
- Circuit breakers must be installed for input (unit input breaker UIB) and bypass (static switch input breaker SSIB).
- For parallel system with three or more UPSs: Circuit breakers must be installed for the output (unit output breaker UOB) of each UPS. The unit output breaker (UOB) is sized as the static switch input breaker (SSIB).
- Live Swap is not supported for >65kA_{bf} installations where current limiting disconnect devices are used to protect the UPS.

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

Schneider Electric reserves the right to remove the Live Swap label from the product front if the conditions are not met.

⚠CAUTION

HAZARD OF FIRE

- Connect only to a circuit with the below specifications.
- Connect to a circuit provided with a maximum 1000 A branch circuit overcurrent protection 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.

Recommended Upstream Protection for UL

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

UPS rating	**200 kW**		**250 kW**	
	Input	**Bypass**	**Input**	**Bypass**
Breaker type	LJF36400CU31X	LJF36250CU31X	LJF36400CU31X	LJF36400CU31X
Ir	350	250	400	350
tr	≥4	≥4	≥4	≥4
Ii (x In)	≤12	≤12	≤12	≤12

UPS rating	**300 kW**		**350 kW**		**400 kW**	
	Input	**Bypass**	**Input**	**Bypass**	**Input**	**Bypass**
Breaker type	PJF36060CU31-A	LJF36400CU31X	PJF36060CU31A	PJF36060CU31A	PJF36080CU31A	PJF36060CU31A
Ir	500	400	600	450	700	500
tr	≥4	≥4	≥4	≥4	≥4	≥4
Ii (x In)	≤12	≤12	≤10	≤12	≤10	≤12

UPS rating	450 kW		500 kW	
	Input	Bypass	Input	Bypass
Breaker type	PJF36080CU31A	PJF36060CU31A	PJF36080CU31A	PJF36080CU31A
Ir	700	600	800	700
tr	≥4	≥4	≥4	≥4
Ii (x In)	≤8	≤10	≤8	≤10

Recommended Cable Sizes for UL

⚠⚠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 500 kcmil.
- Shrink sleeve must be fitted over cable lug crimped zone and must overlap with the cable insulation on all power cables.

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

The maximum number of cable connections per busbar:

- 4 on input/output/bypass busbars
- 4 x 500 kcmil on input/output/bypass busbars
- 4 x 500 kcmil or 8 x 300 kcmil on DC+/DC- busbars
- 8 on N busbar
- 16 on ground busbar

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[33]:

- 90 °C (194 °F) conductors (75 °C (167 °F) termination)
- An ambient temperature of 30 °C (86 °F)
- Use of copper or aluminum 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 the minimum requirements in NEC Article 250.122 and Table 250.122.

NOTE: 100% rated circuit breakers for UIB, UOB, MBB, SSIB. 100% rated breakers for battery breakers.

Copper

UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
Voltage (V)	**480**	**480**	**480**	**480**	**480**	**480**	**480**
Input phases (AWG/kcmil)	1 x 350	1 x 500	2 x 4/0	2 x 300	2 x 350	2 x 400	2 x 500
Input EGC (AWG/kcmil)	1 x 3	1 x 3	2 x 2	2 x 1	2 x 1/0	2 x 1/0	2 x 1/0
Bypass/output phases (AWG/kcmil)	1 x 250	1 x 350	1 x 500	2 x 4/0	2 x 250	2 x 300	2 x 350

33. Using non-recommended cable sizes will affect the eConversion limits for parallel UPS systems. Be sure to check the Standard eConversion Limits Based on Non-recommended Cable Sizes, page 39 table in this installation scenario.

Copper (Continued)

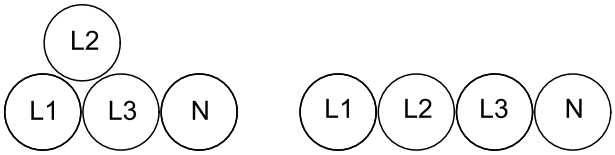
UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
Voltage (V)	**480**	**480**	**480**	**480**	**480**	**480**	**480**
Bypass EGC/output EGC (AWG/kcmil)	1 x 4	1 x 3	1 x 3	2 x 2	2 x 2	2 x 1	2 x 1/0
DC+/DC- (AWG/kcmil) (mm^2)	2 x 300	2 x 400	3 x 350	3 x 400	4 x 350	4 x 400	4 x 500
DC EGC (AWG/kcmil)	2 x 1	2 x 1/0	3 x 2/0	3 x 2/0	4 x 3/0	4 x 4/0	4 x 4/0
Inverter midpoint cable for 3-wire parallel (AWG/kcmil)	1 x 350	1 x 500	2 x 4/0	2 x 300	2 x 350	2 x 400	2 x 500

Aluminum

UPS rating	200 kW	250 kW	300 kW	350 kW	400 kW	450 kW	500 kW
Voltage (V)	**480**	**480**	**480**	**480**	**480**	**480**	**480**
Input phases (AWG/kcmil)	1 x 500	2 x 250	2 x 300	2 x 400	2 x 500	(3 x 300)[34]	(3 x 400)[34]
Input EGC (AWG/kcmil)	1 x 1	2 x 1	2 x 1/0	2 x 2/0	2 x 3/0	3 x 3/0	3 x 3/0
Bypass/output phases (AWG/kcmil)	1 x 350	1 x 500	2 x 250	2 x 300	2 x 350	2 x 500	2 x 500
Bypass EGC/output EGC (AWG/kcmil)	1 x 2	1 x 1	2 x 1	2 x 1/0	2 x 1/0	2 x 2/0	2 x 3/0
DC+/DC- (AWG/kcmil) (mm^2)	2 x 500	3 x 300	3 x 500	4 x 350	4 x 500	5 x 400	5 x 500
DC EGC (AWG/kcmil)	1 x 2/0	3 x 3/0	3 x 4/0	4 x 4/0	4 x 250	5 x 350	5 x 350
Inverter midpoint cable for 3-wire parallel (AWG/kcmil)	1 x 500	2 x 250	2 x 300	2 x 400	2 x 500	3 x 300	3 x 400

Guidance for Organizing Input, Bypass, And Output Cables

The input, bypass, and output cables must be grouped in circuits. On raceways, use one of the two shown cable formations.

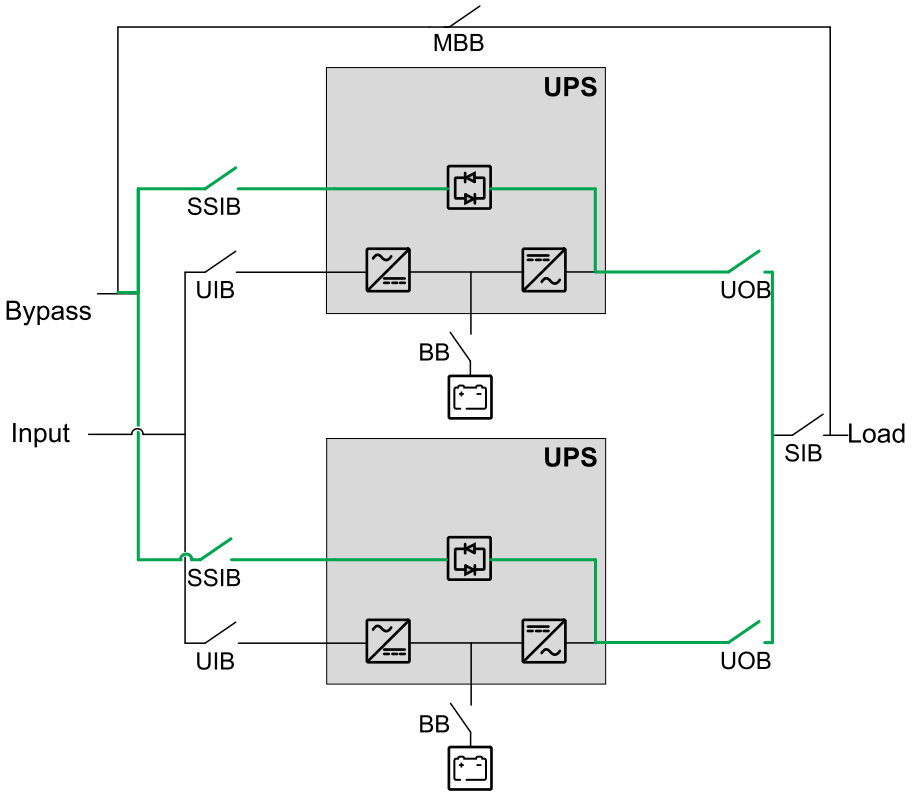


Load Sharing in Bypass Operation in a Parallel System

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

34. For parallel UPS systems, the Standard eConversion Limits Based on Non-recommended Cable Sizes, page 39 table shall be used.

Parallel System – Dual Mains



NOTICE

RISK OF EQUIPMENT DAMAGE

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

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

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

Failure to follow these instructions can result in equipment damage.

eConversion Limits for Parallel UPS Systems

eConversion requires a minimum load percentage on the UPS for parallel UPS systems. The minimum required load percentages depend on the power cable sizes.

NOTE: For installations using the recommended cable sizes, refer to the Standard eConversion Limits Based on Recommended Cable Sizes, page 39 table for the minimum load percentages.

Standard eConversion Limits Based on Recommended Cable Sizes

UPS rating	Minimum load %
200 kW	34%
250 kW	27%
300 kW	23%
350 kW	19%
400 kW	17%
450 kW	15%
500 kW	14%

The other prerequisites to use this table include:

- The values are calculated based on the use of recommended cable sizes.
- Installations with maximum two cables on each phase are supported.
- The bypass and output cables must have equal length for all UPSs.

  NOTE: For certain installations such as installations with 80% breakers or where other installation methods have been applied to comply with the IEC standard, it is possible that non-recommended cable sizes will be used. For installations using non-recommended cable sizes, refer to the Standard eConversion Limits Based on Non-recommended Cable Sizes, page 39 table for the voltage ratings percentages.

Standard eConversion Limits Based on Non-recommended Cable Sizes

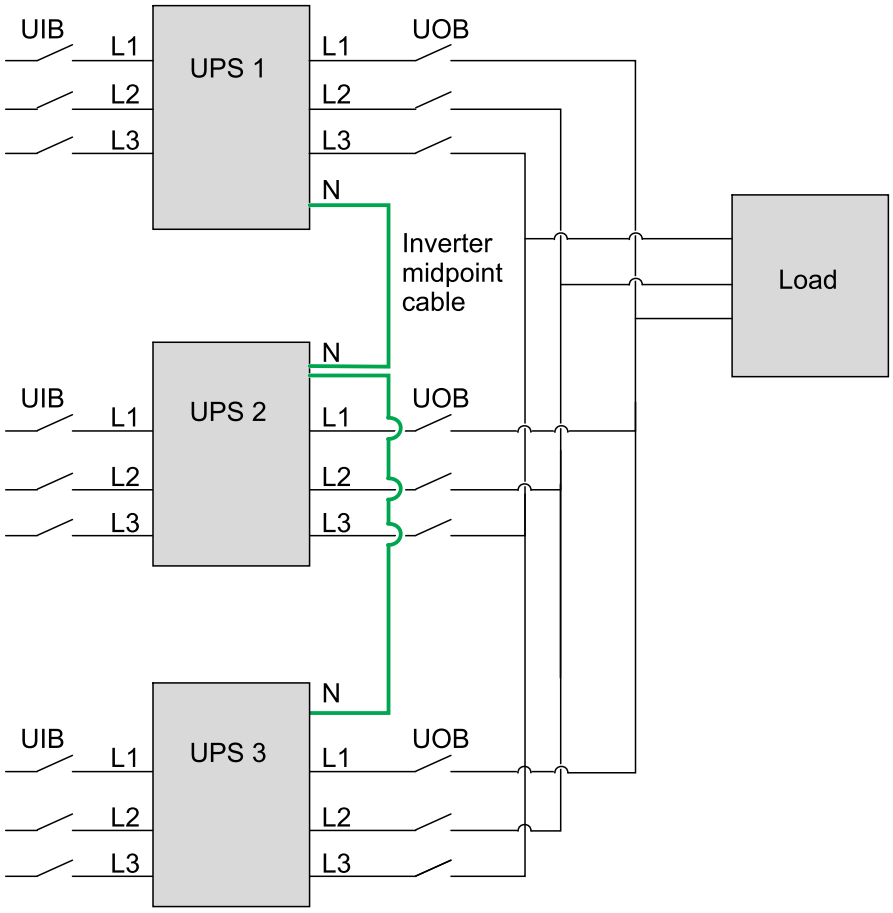
UPS rating	Minimum load %
200 kW	50%
250 kW	40%
300 kW	34%
350 kW	29%
400 kW	25%
450 kW	22%
500 kW	20%

The other prerequisites to use this table include:

- The values are calculated based on the scenario of using non-recommended cable sizes.
- Installations with three or four cables on each phase are supported.
- The bypass and output cables must have equal length for all UPSs.

For 3-Wire Parallel Systems Only

In a parallel installation installed as a 3-wire AC configuration, the inverter midpoint of each UPS must be interconnected by cable in a daisy chain configuration. The inverter midpoint cable size can be found in the recommended cable sizes table.



When the inverter midpoint of the parallel UPSs is permanently connected, there is still potentially dangerous voltage present on the neutral busbar inside the UPS even after the UPS has been isolated from the parallel system for maintenance and has been completely shut down. Due to the dangerous voltages on the neutral busbar, all service activities that need access inside the I/O section by opening the inner door require full shutdown of the entire parallel system and transfer to maintenance bypass.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Hard-wired inverter midpoint between the UPS systems is energized even when the UPS is isolated from the parallel system and completely shut down.
- Even if absence of voltage is measured, there can still be dangerous voltage transients on the neutral busbar.
- Entering the I/O terminal area requires full shutdown or the entire parallel system and transfer to maintenance bypass.

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

NOTE: For 3-wire parallel systems that have neutral available from the input source, the parallel system can be installed as a 4-wire AC configuration, which does not require the inverter midpoint connection between each UPS. Contact Schneider Electric for more details.

Recommended Bolt and Lug Sizes

NOTICE
RISK OF EQUIPMENT DAMAGE Use only UL approved compression cable lugs. **Failure to follow these instructions can result in equipment damage.**

Copper

Cable size	Bolt size	Cable lug type (one hole)	Cable lug type (two hole NEMA)	Crimping tool	Die
1/0 AWG	M10x35mm	LCB1/0-12-X	LCC1/0-12-X	CT-930	CD-920-1/0 Pink P42
2/0 AWG	M10x35mm	LCB2/0-12-X	LCC2/0-12-X	CT-930	CD-920-2/0 Black P45
3/0 AWG	M10x35mm	LCB3/0-12-X	LCC3/0-12-X	CT-930	CD-920-3/0 Orange P50
4/0 AWG	M10x35mm	LCB4/0-12-X	LCC4/0-12-X	CT-930	CD-920-4/0 Purple P54
250 kcmil	M10x35mm	LCB250-12-X	LCC250-12-X	CT-930	CD-920-250 Yellow P62
300 kcmil	M10x35mm	LCB300-12-X	LCC300-12-X	CT-930	CD-920-300 Red P66
350 kcmil	M10x35mm	LCB350-12-X	LCC350-12-X	CT-930	CD-920-350 Red P71
400 kcmil	M10x35mm	LCB400-12-X	LCC400-12-6	CT-930	CD-920-400 Blue P76
450 kcmil	M10x35mm	—	LCC450-12-6	CT-930	—
500 kcmil	M10x35mm	LCB500-12-X	LCC500-12-6	CT-930	CD-920-500 Blue P87

Aluminum

Cable size	Bolt size	Cable lug type (one hole)	Cable lug type (two hole NEMA)	Crimping tool	Die
1/0 AWG	M10x35mm	LAA1/0-12-5	LAB1/0-12-X	CT-930	CD-920-1/0 Pink P42
2/0 AWG	M10x35mm	LAA2/0-12-5	LAB2/0-12-5	CT-930	CD-920-2/0 Black P45
3/0 AWG	M10x35mm	LAA3/0-12-5	LAB3/0-12-5	CT-930	CD-920-3/0 Orange P50
4/0 AWG	M10x35mm	LAA4/0-12-5	LAB4/0-12-5R	CT-930	CD-920-4/0 Purple P54
250 kcmil	M10x35mm	LAA250-12-5	LAB250-12-5	CT-930	CD-920-250 Yellow P62
300 kcmil	M10x35mm	LAA300-12-2	LAB300-12-2	CT-930	CD-920-300 Red P66
350 kcmil	M10x35mm	LAA350-12-2	LAB350-12-2R	CT-930	CD-920-350 Red P71
400 kcmil	M10x35mm	—	LAB400-12-2	CT-930	CD-920-400 Blue P76
500 kcmil	M10x35mm	LAA500-12-2	LAB500-12-2R	CT-930	CD-920-500 Blue P87

Torque Specifications

Bolt size	Torque
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)

Requirements for a Third Party Battery Solution

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

Third Party Battery Breaker Requirements

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- All selected battery breakers must be equipped with instantaneous trip functionality with an undervoltage release coil or a shunt trip release coil.
- Trip delay must be set to zero on all battery breakers.

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

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

Design Requirements for Battery Breaker

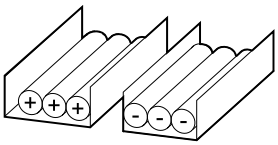
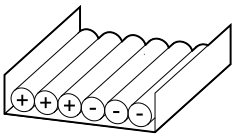
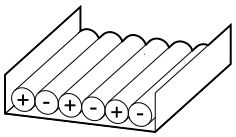
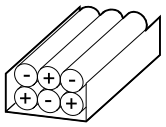
Battery breaker rated DC voltage > Normal battery voltage	The normal voltage of the battery configuration is defined as the highest nominal occurring battery voltage. This can be equivalent to the float voltage which may be defined as **number of battery blocks x number of cells x cell float voltage**.
Battery breaker rated DC current > Rated discharge battery current	This current is controlled by the UPS and must include maximum discharge current. This will typically be the current at the end of discharge (minimum operation DC voltage or in overload condition or a combination).
DC landings	Two DC landings for DC cables (DC+ and DC-) are required.
AUX switches for monitoring	One AUX switch must be installed in each battery breaker and connected to the UPS. The UPS can monitor up to four battery breakers.
Short-circuit breaking capability	The short-circuit breaking capability must be higher than the short-circuit DC current of the (largest) battery configuration.
Minimum trip current	The minimum short-circuit current to trip the battery breaker must match the (smallest) battery configuration, to make the breaker trip in case of a short circuit, up to the end of its life time.
Common battery solution	Individual battery breaker for each UPS in the parallel system.

Guidance for Organizing Battery Cables

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

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

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

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

Environment

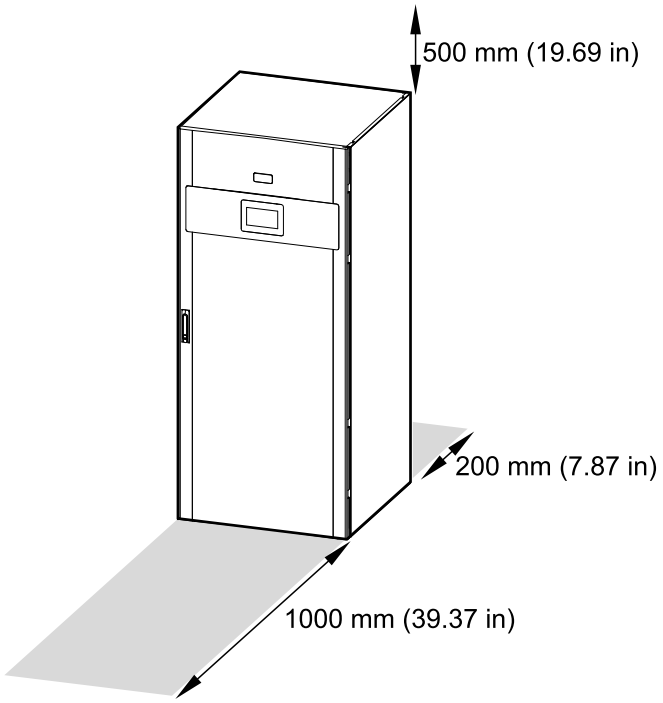
	Operating	Storage
Temperature	0 °C to 40 °C (32 °F to 104 °F) without load derating. 40 °C to 50 °C (104 °F to 122 °F) when derated to 75% power.	-25 °C to 55 °C (-13 °F to 131 °F) for systems without batteries.
Relative humidity	0-95% non-condensing	10-80% non-condensing
Elevation	Designed for operation in 0-3000 m (0-10000 feet) elevation. Derating required from 1000-3000 m (3300-10000 feet) with forced air cooling: Up to 1000 m (3300 feet): 1.000 Up to 1500 m (5000 feet): 1.000 conditioned by 2 x 300 mm^2 input cables at 500 kW Up to 1500 m (5000 feet) : 0.975 Up to 2000 m (6600 feet): 1.000 conditioned by 2 x 300 mm^2 input cables at 500 kW Up to 2000 m (6600 feet): 0.950 Up to 2500 m (8300 feet): 0.975 conditioned by 2 x 300 mm^2 input cables at 500 kW Up to 2500 m (8300 feet): 0.925 Up to 3000 m (10000 feet): 0.950 conditioned by 2 x 300 mm^2 input cables at 500 kW Up to 3000 m (10000 feet): 0.900 Derating required from 1000-3000 m (3300-10000 feet) with convection cooling: Up to 1000 m (3300 feet): 1.000 Up to 1500 m (5000 feet) : 0.985 Up to 2000 m (6600 feet): 0.970 Up to 2500 m (8300 feet): 0.955 Up to 3000 m (10000 feet): 0.940	
Audible noise one meter (three feet) from unit	62 dB at 70% load 69.5 dB at 100% load for 400 V systems 68 dB at 100% load for 480 V systems	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

UPS Weights and Dimensions

UPS rating	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
200 kW	550 (1212)	1970 (78)	850 (33)	925 (36)
250 kW	588 (1296)	1970 (78)	850 (33)	925 (36)
300 kW	626 (1380)	1970 (78)	850 (33)	925 (36)
350 kW	664 (1463)	1970 (78)	850 (33)	925 (36)
400 kW	702 (1547)	1970 (78)	850 (33)	925 (36)
450 kW	740 (1631)	1970 (78)	850 (33)	925 (36)
500 kW	778 (1715)	1970 (78)	850 (33)	925 (36)

Clearance

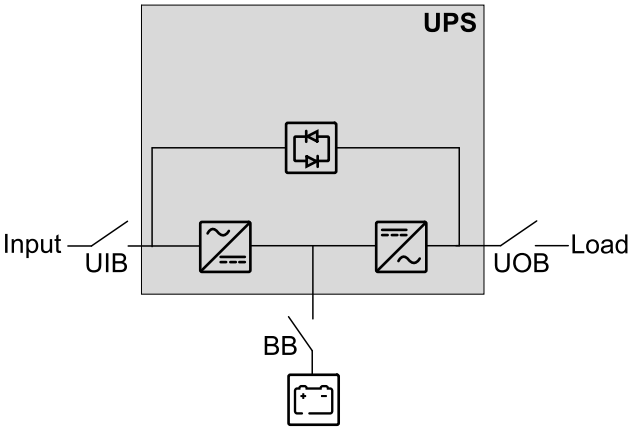
NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.



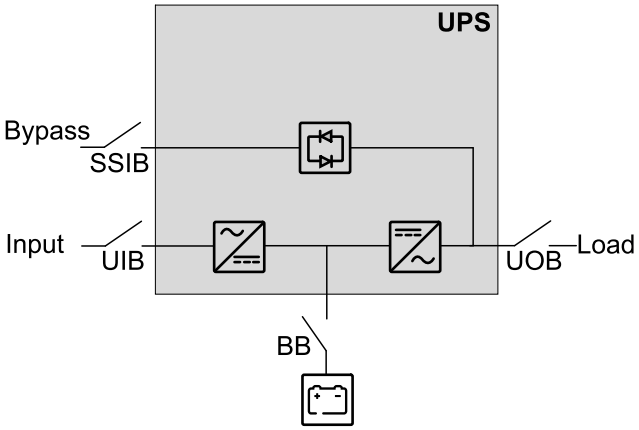
Single System Overview

UIB	Unit input breaker
SSIB	Static switch input breaker
UOB	Unit output breaker
BB	Battery breaker

Single System – Single Mains



Single System – Dual Mains

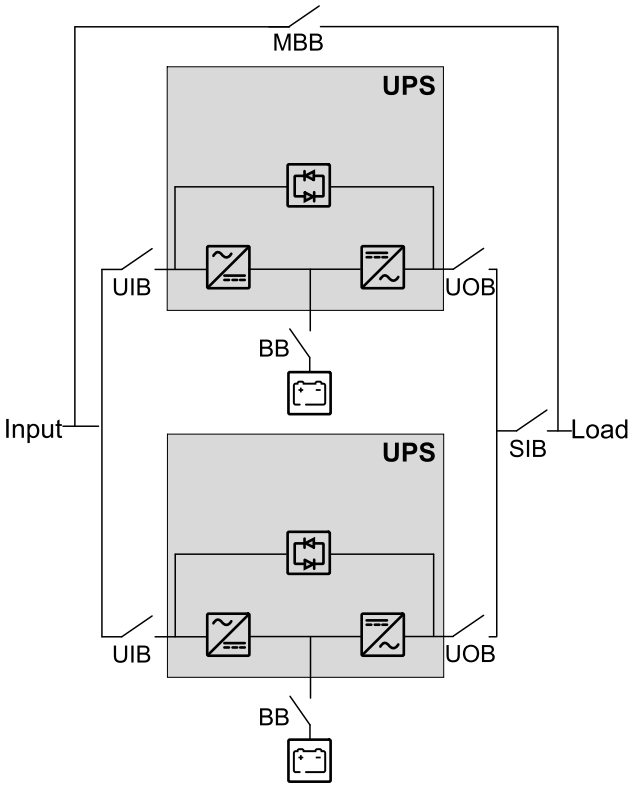


Parallel System Overview

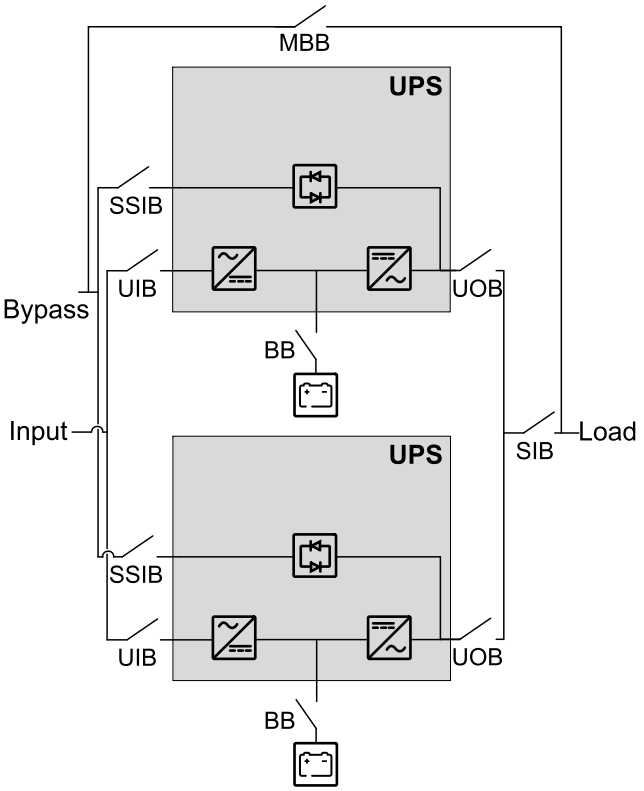
UIB	Unit input breaker
SSIB	Static switch input breaker
UOB	Unit output breaker
SIB	System isolation breaker
BB	Battery breaker
MBB	External maintenance bypass breaker

Galaxy VL can support up to 6 UPSs in parallel for capacity and up to 5+1 UPSs in parallel for redundancy with individual unit input breaker UIB and static switch input breaker SSIB.

Parallel System – Single Mains



Parallel System – Dual Mains



Installation Procedure for UPS

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS must be secured against movement. Perform one of the following once the UPS is in its final position:

- Lower the leveling feet until the casters no longer have contact with the floor, OR
- Reinstall the front transportation bracket (870-32577) on the UPS and mount it to the floor, OR
- Install the seismic anchoring kit.

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

1. Perform one of the following procedures:
   - Without seismic anchoring: Position the UPS, page 51.
   - With seismic anchoring: Install the Seismic Anchoring (Option), page 52.
2. Perform one of the following procedures:
   - Top cable entry: Prepare the UPS for Top Cable Entry, page 54.
   - Bottom cable entry: Follow in the installation manual provided with the bottom entry cabinet.
3. Only for TNC or HRG earthing system:
   - Prepare for TNC Earthing System, page 56.
   - Prepare for HRG Earthing System, page 57.
4. Perform one of the following procedures:
   - Connect Power Cables in the UPS in System over 45 kAIC/kA Icw, page 58, or
   - Connect Power Cables in the UPS in System up to 45 kAIC/kA Icw, page 65.
5. Connect the Signal Cables, page 69.
6. Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 72.
7. Connect the Modbus Cables, page 76.
8. Only for parallel system: Connect the PBUS Cables, page 78.
9. Only for external synchronization: Connect the Signal Cables for External Synchronization, page 79.
10. Install the Power Module(s), page 83.
11. Add Translated Safety Labels to Your Product, page 85.
12. Final installation, page 89.

Installation Procedure for UPS with Maintenance Bypass Cabinet

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS must be secured against movement. Perform one of the following once the UPS is in its final position:

- Lower the leveling feet until the casters no longer have contact with the floor, OR
- Reinstall the front transportation bracket (870-32577) on the UPS and mount it to the floor, OR
- Install the seismic anchoring kit.

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

1. Follow the maintenance bypass cabinet installation manual for seismic anchoring, mechanical installation, interconnection, power cabling, and signal cable routing for the UPS and the maintenance bypass cabinet. Specifications for the UPS system are listed in the UPS installation manual.
2. Connect the Signal Cables, page 69.
3. Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 72.
4. Connect the Modbus Cables, page 76.
5. Only for external synchronization: Connect the Signal Cables for External Synchronization, page 79.
6. Install the Power Module(s), page 83.
7. Add Translated Safety Labels to Your Product, page 85.
8. Final installation, page 89.

Position the UPS

⚠⚠DANGER

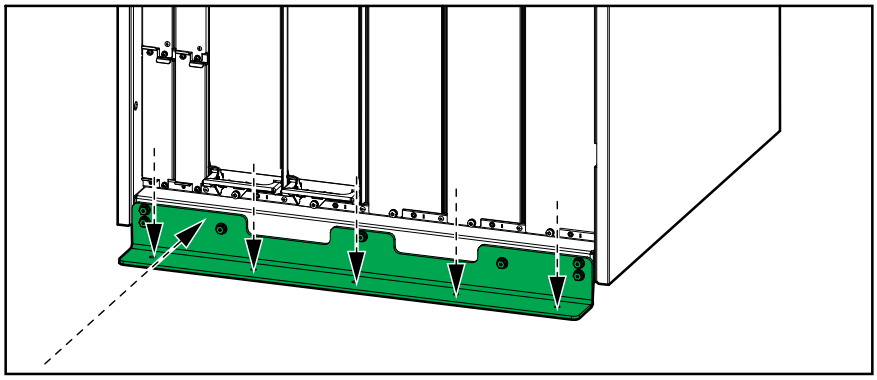
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS must be secured against movement. Perform one of the following once the UPS is in its final position:

- Lower the leveling feet until the casters no longer have contact with the floor, OR
- Mount the front transportation bracket (870-32577) on the UPS to the floor.

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

1. Push the UPS into final position.
2. Reinstall the front transportation bracket (870-32577) on the UPS.
3. Perform one of the following:
   – Mount the front transportation bracket to the floor. Use appropriate hardware for the floor type – the hole diameter in the bracket is ø14 mm. Minimum requirement is M12 strength grade 8.8 hardware.



   – Lower the front and rear leveling feet on the UPS with a wrench until they connect with the floor. The casters must not have contact 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.

NOTICE

RISK OF EQUIPMENT DAMAGE

Install the front transportation bracket to avoid the UPS overheating from circulating hot air from the rear outlets. The front transportation bracket blocks the hot air backflow.

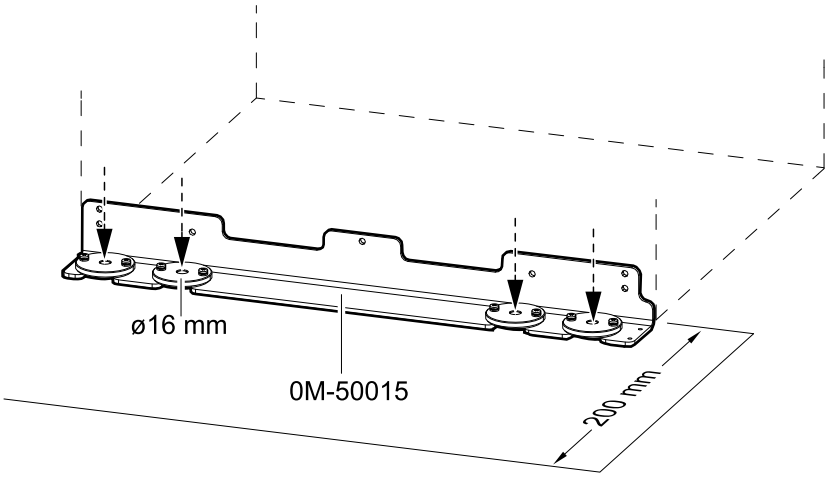
Failure to follow these instructions can result in equipment damage.

Install the Seismic Anchoring (Option)

Use the optional seismic kit GVLOPT002 for this procedure.

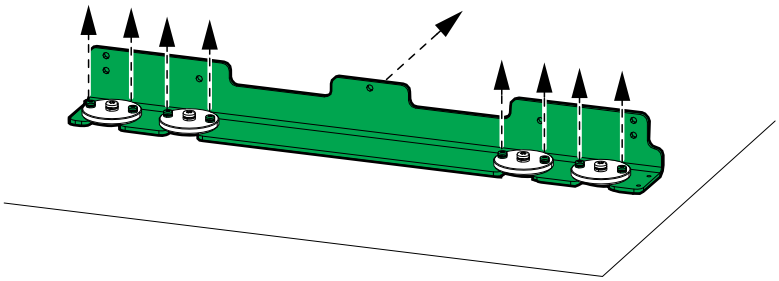
1. Mount the rear anchoring assembly to the floor. Use appropriate hardware for the floor type – the hole diameter in the rear anchors is ø16 mm. Minimum requirement is M12 strength grade 8.8 hardware.

Rear View



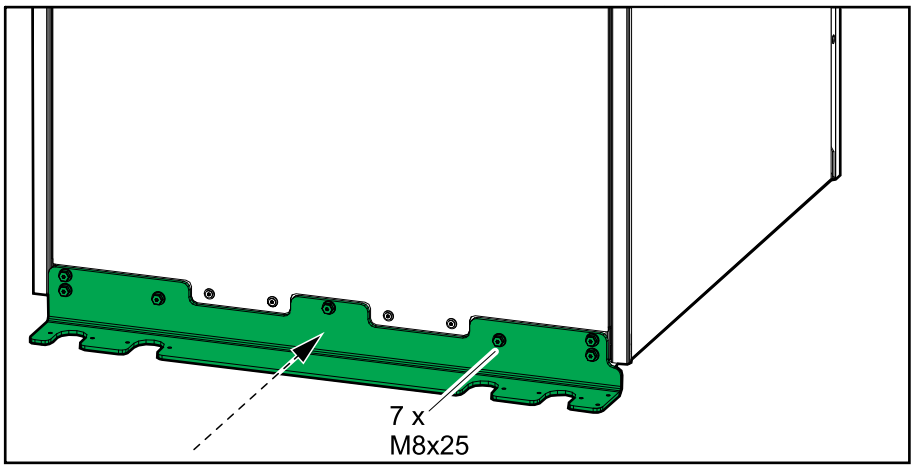
2. Remove all the screws and remove the anchoring bracket.

Rear View



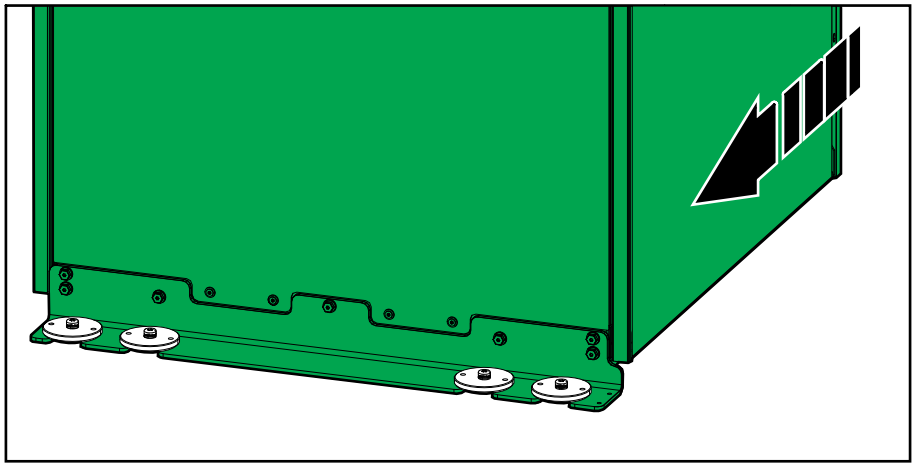
3. Install the rear anchoring brackets on the UPS with the provided M8x25 bolts.

Rear View

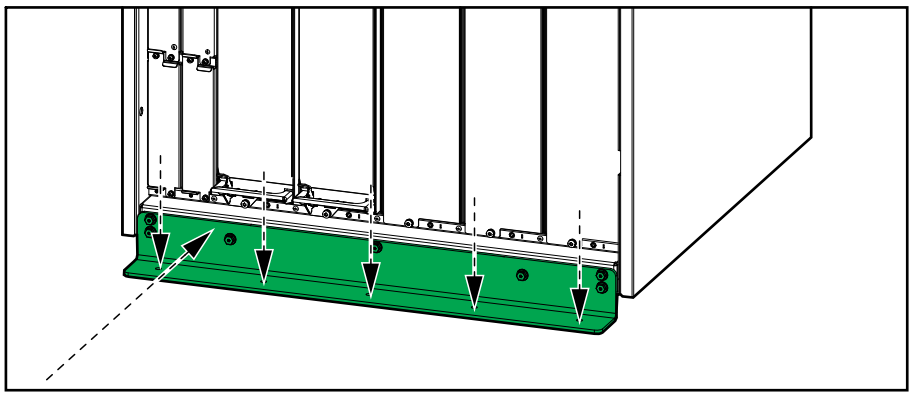


4. Push the UPS into final position. Align with the seismic anchoring.

Rear View



5. Install the seismic front anchoring bracket on the UPS and mount it to the floor. Use appropriate hardware for the floor type – the hole diameter in the bracket is ø14 mm. Minimum requirement is M12 strength grade 8.8 hardware.



Prepare the UPS for Top Cable Entry

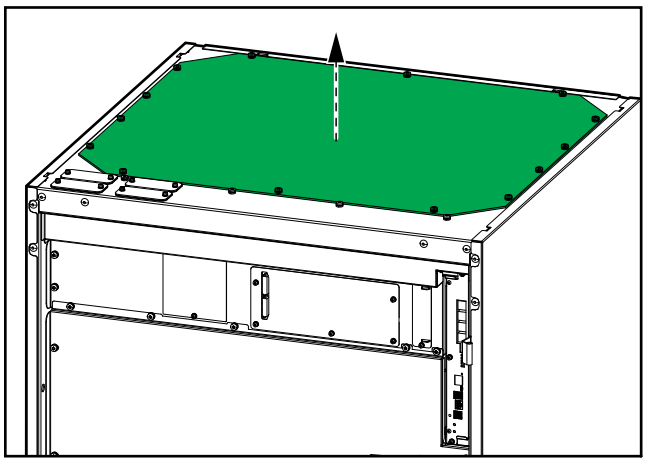
⚠DANGER

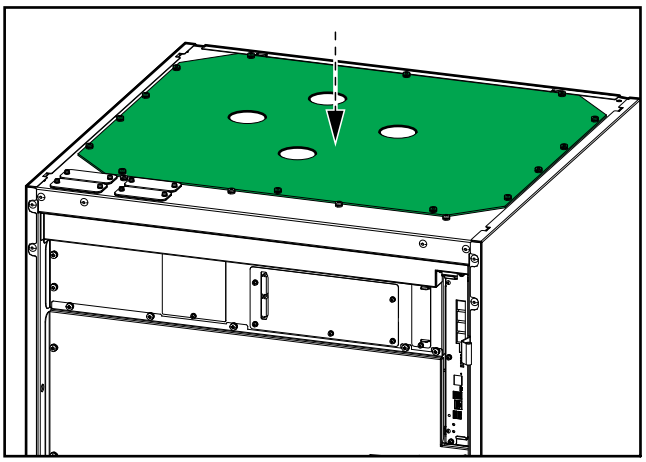
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or punch holes with the gland plates installed and do not drill or punch holes in close proximity to the cabinet.

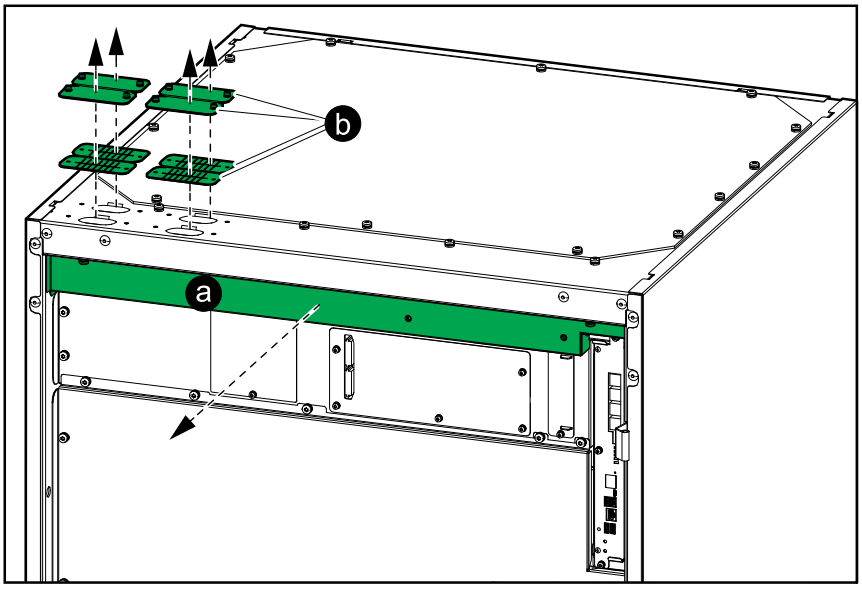
Failure to follow these instructions will result in death or serious injury.

1. Prepare for power cables:
   a. Remove the gland plate from the top of the UPS.
   b. Drill/punch holes for power cables or conduits/grommets in the gland plate. Install conduits/grommets (not provided), if applicable.
   c. Reinstall the gland plate.



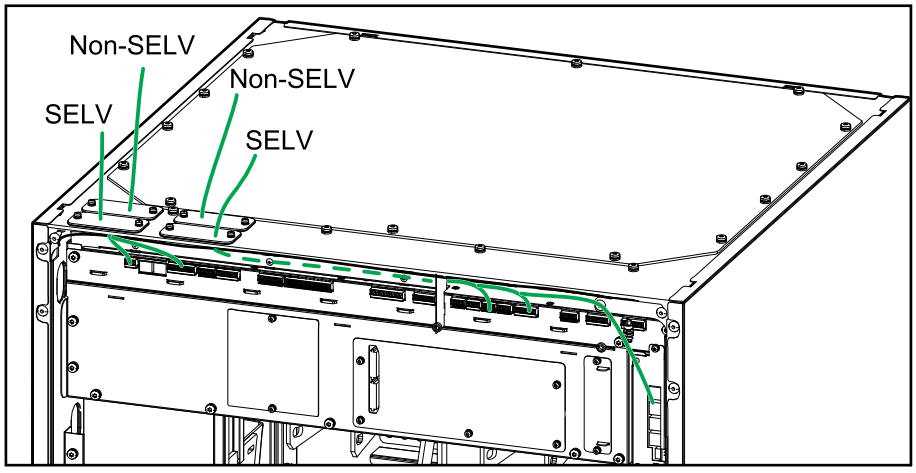


2. Prepare for signal cables:
   a. Remove the cover in front of the signal connections. Save for final installation steps.
   b. Remove the gland plates and brush plates from the top of the UPS.



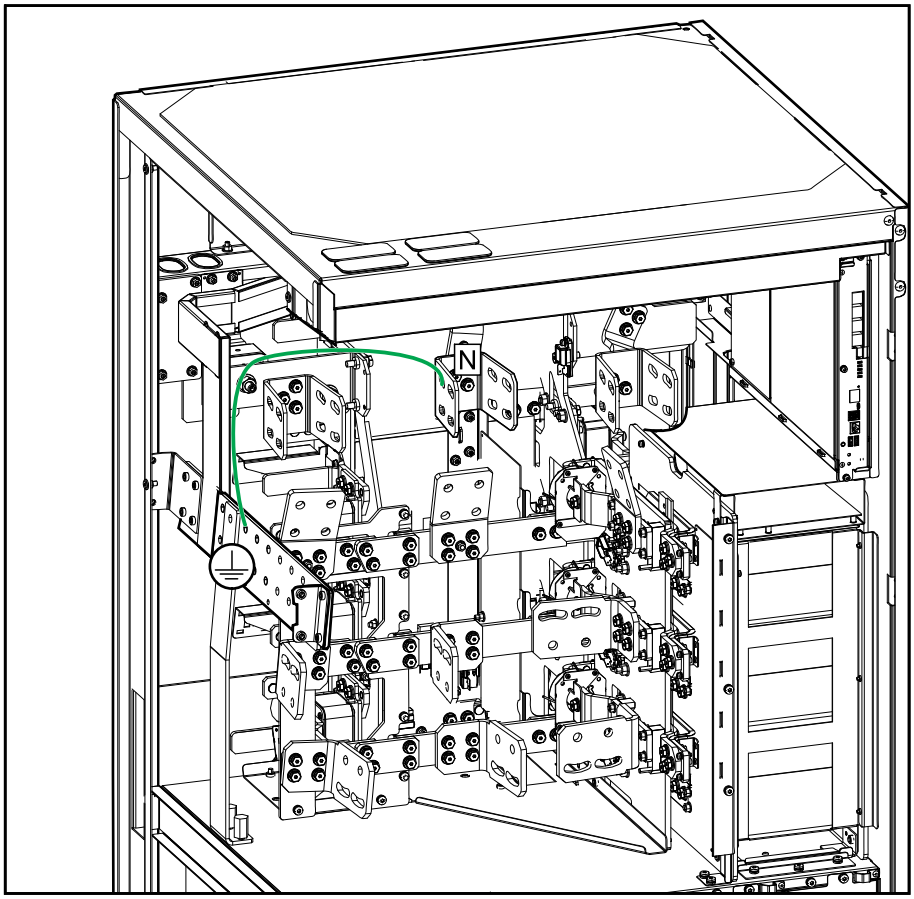
   c. **For installation without conduits/grommets**: Reinstall the brush plates.
   d. **For installation with conduits/grommets**: Drill holes in the gland plates for conduits/grommets, install conduits/grommets, and reinstall the gland plates.

3. Route the signal cables as shown to separate the Class 2/SELV cables from the non-Class 2/non-SELV cables.



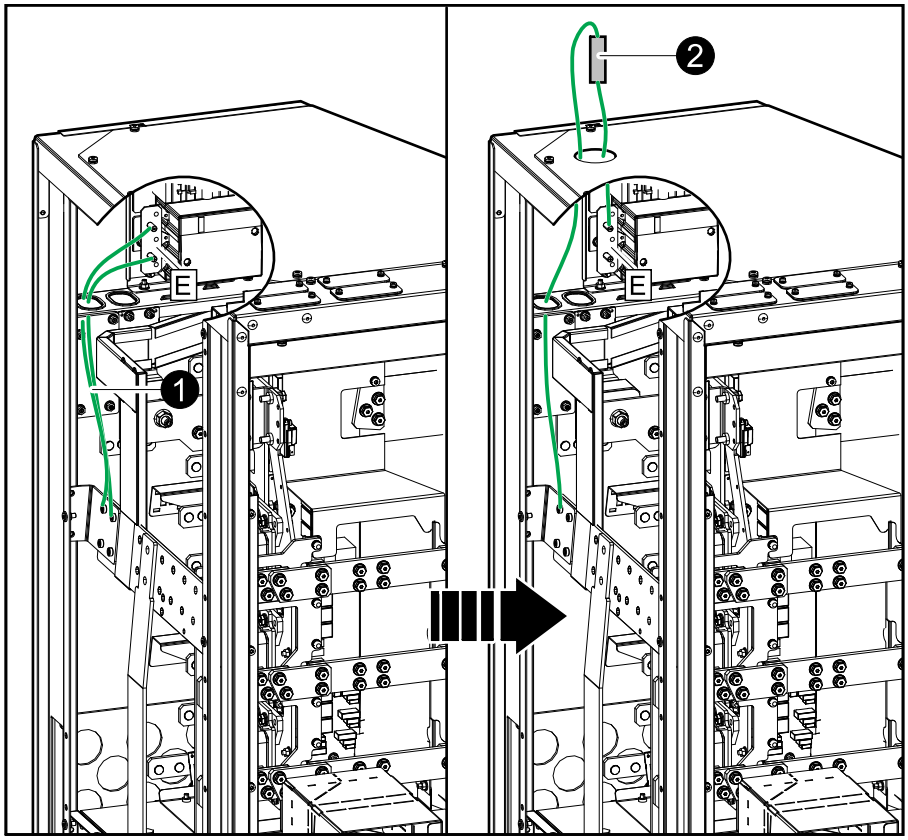
Prepare for TNC Earthing System

1. Connect power cable(s) (not provided) from the PE busbar to the N busbar. Use the same number of cables and cable size as the output N cables.



Prepare for HRG Earthing System

1. Remove the two preconnected cables that connect the E terminal on the bonding contactor to the ground busbar. Discard the cables.
2. Connect an external impedance between the E terminal on the bonding contactor and the ground busbar according to NEC article 250.36.

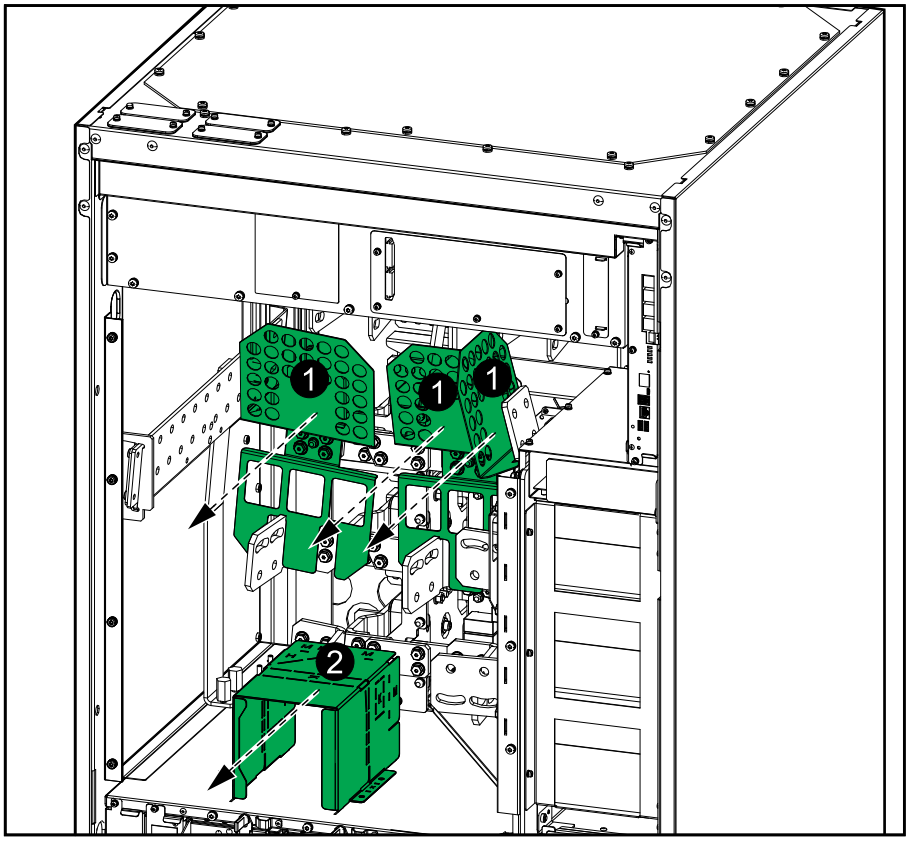


Connect Power Cables in the UPS in System over 45 kAIC/kA Icw

NOTE: If a Li-Ion battery control breaker kit (GVLOPT005) is part of your installation, the Li-Ion battery control breaker kit must be installed **before** the power cables are connected in the UPS. Follow the installation manual provided with the Li-Ion battery control breaker kit.

Use kit 0H-1816 for this procedure.

1. Remove the transparent plastic protectors from the busbars. Save for reinstallation after cable connection.

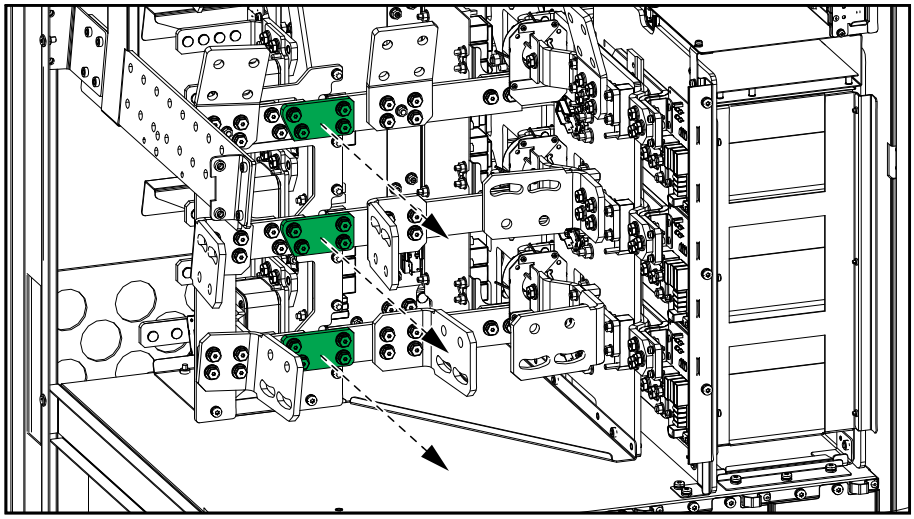


2. Remove the plastic box for easier access. Save for reinstallation after cable connection.

3. **Only for dual mains**: Remove the single mains busbars.

   NOTE: Save the three single mains busbars. They are needed for testing during start-up of the UPS.

Front View of the UPS



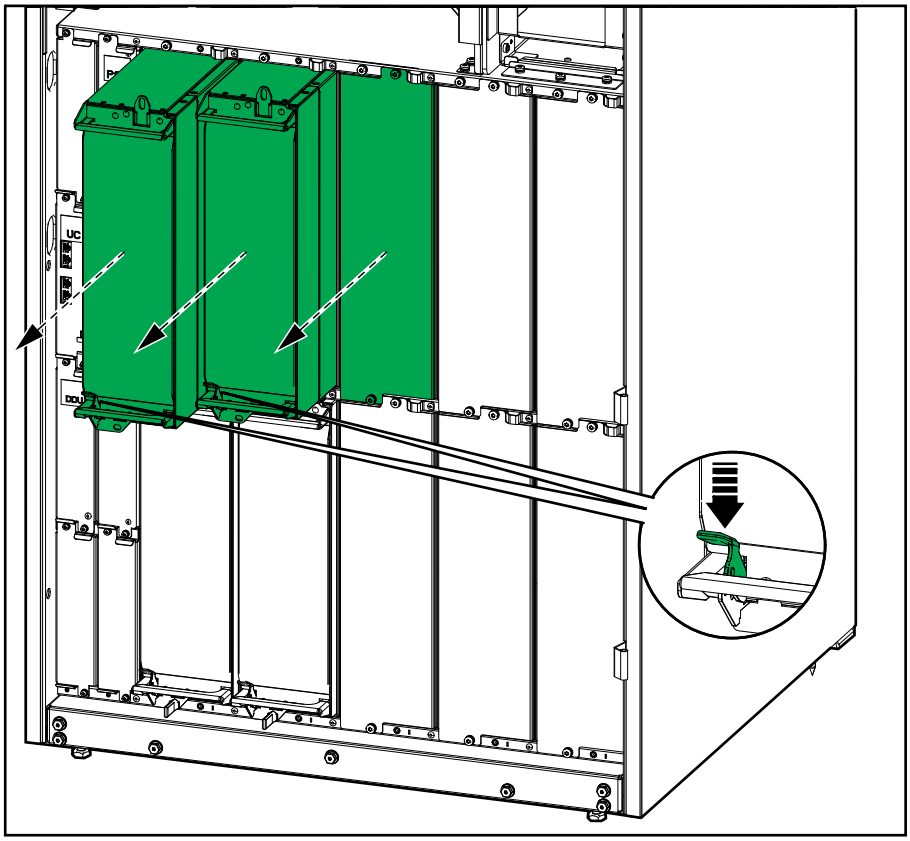
4. Remove the two top power modules and the left-most filler plate:
   a. Remove the screws in the top and bottom of the power module and push the unlock switch.
   b. Pull the power module halfway out. A locking mechanism prevents the power module from being pulled all the way out.
   c. Release the lock by pressing the release button on the top of the power module and remove the power module.

⚠CAUTION

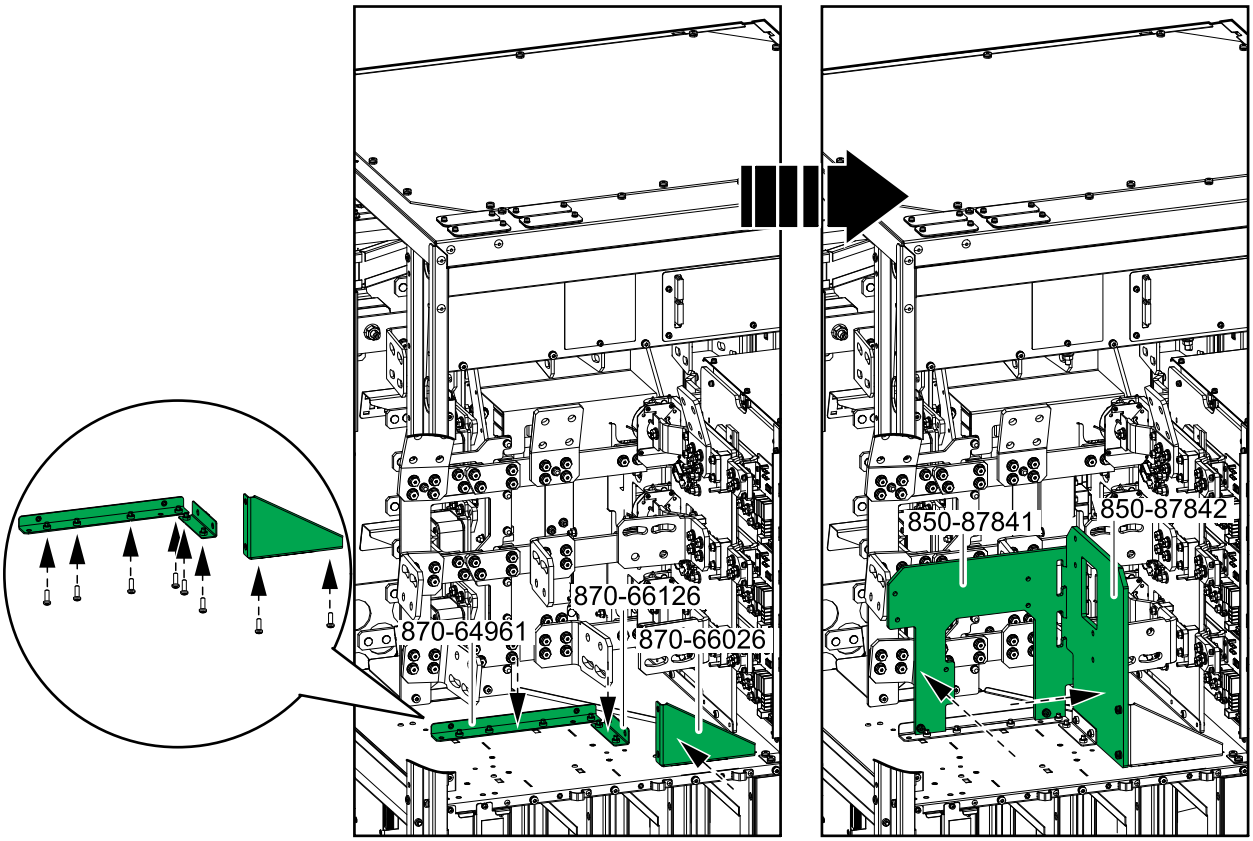
HEAVY LOAD

Power modules are heavy (38 kg (83.77 lbs)) and require two persons to lift.

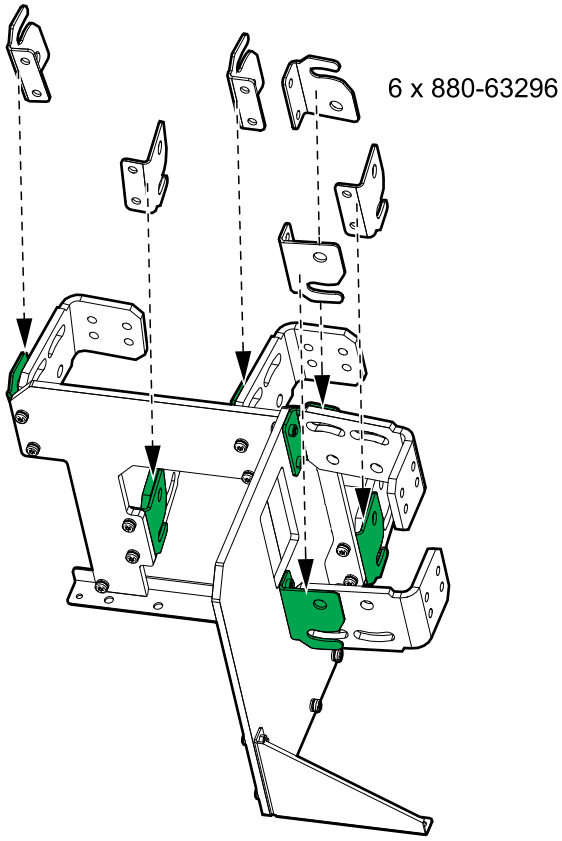
Failure to follow these instructions can result in injury or equipment damage.



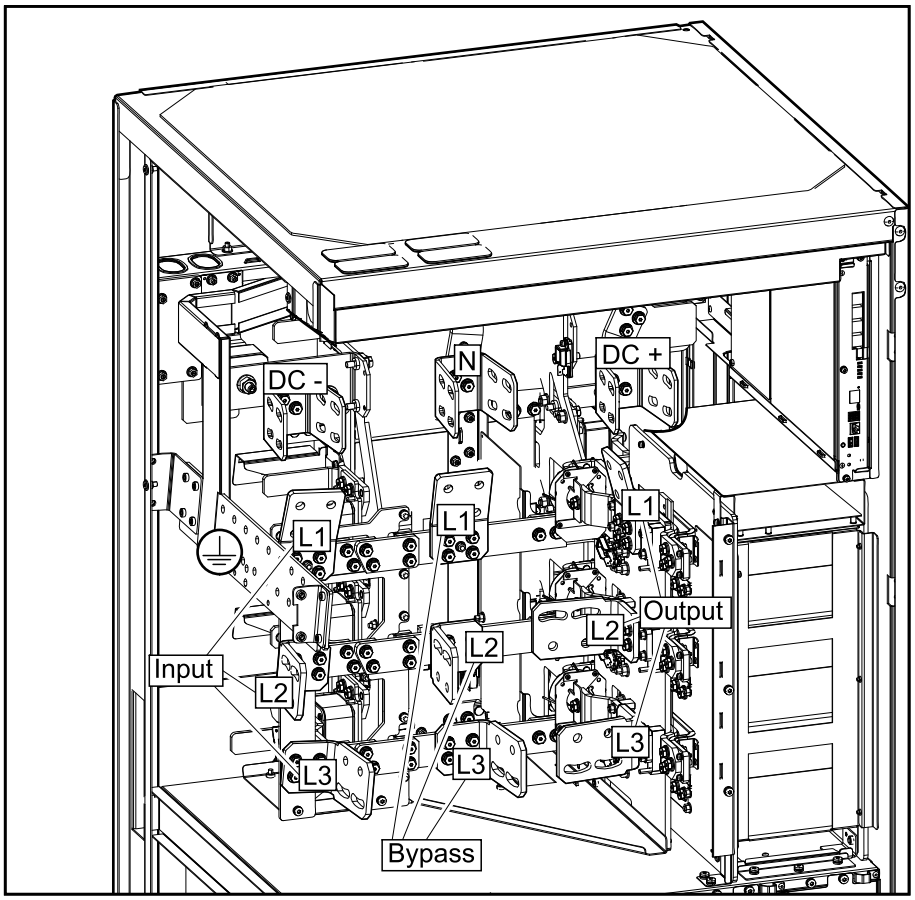
5. Install the three brackets and the two insulator parts on the shelf with the provided screws. Note that the screws are installed on the brackets from below the shelf.



6. Install the six brackets on the rear and right side of the insulator parts with the provided screws. The brackets connect from the insulator parts to the busbars. The bracket is fastened to the busbar when the power cable is installed.



7. Connect the power cables in the described order. Assemble the cable lugs to the busbars as shown.



a. Connect the PE cables/equipment grounding conductor (EGC).

b. Connect the DC cables (DC+, DC-).

c. Connect the input cables. Ensure to install the L2 and L3 power cable through both the busbar and the bracket.

d. **Only for dual mains**: Connect the bypass cables. Ensure to install the L2 and L3 power cable through both the busbar and the bracket.

e. Connect the output cables. Ensure to install the L2 and L3 power cable through both the busbar and the bracket.

f. **Only for 3-wire parallel system**: Connect the inverter midpoint cable to the neutral busbar. Daisy-chain the inverter midpoint cable between the neutral busbars in the UPSs in the parallel system. Add the provided danger label 885-92714 on the inner door of the UPS.

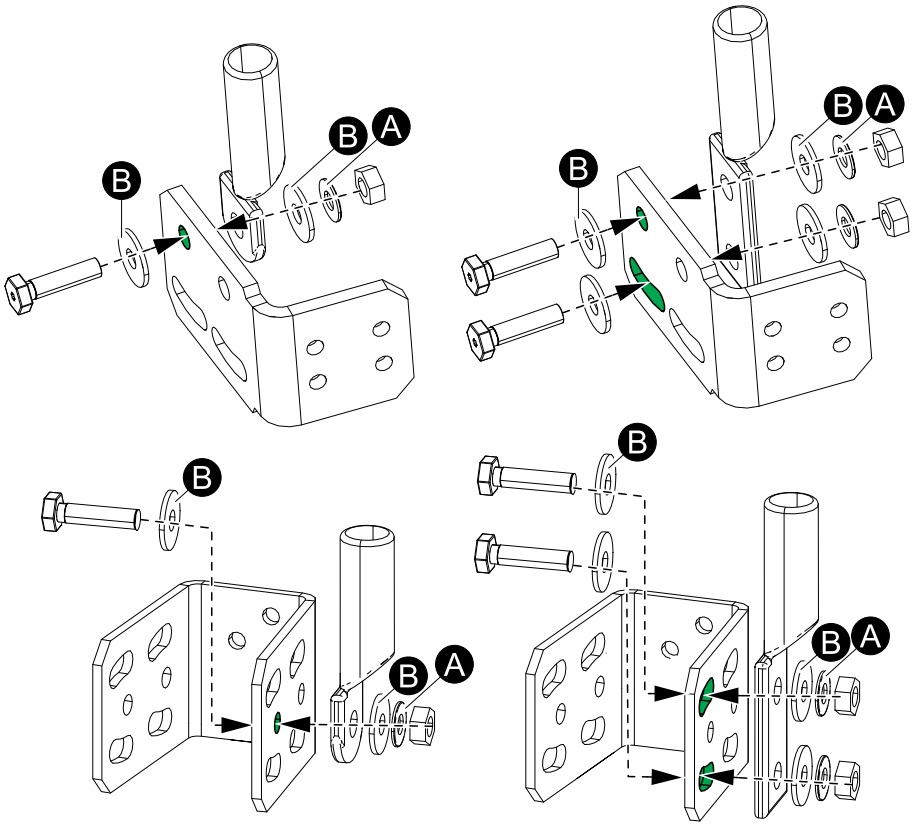
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Hard-wired inverter midpoint between the UPS systems is energized even when the UPS is isolated from the parallel system and completely shut down.
- Even if absence of voltage is measured, there can still be dangerous voltage transients on the neutral busbar.
- Entering the I/O terminal area requires full shutdown or the entire parallel system and transfer to maintenance bypass.

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

Cable Lug to Busbar Assembly



A. Spring washer – provided in kit.
B. Flat washer (not provided).

⚠CAUTION

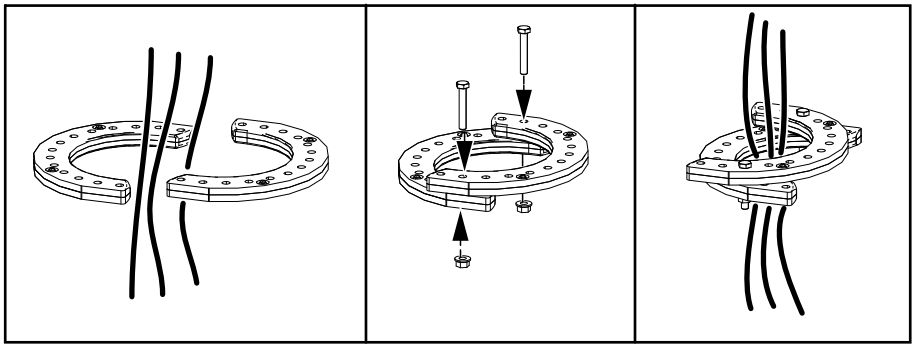
RISK OF CABLE LUG DISCONNECTION

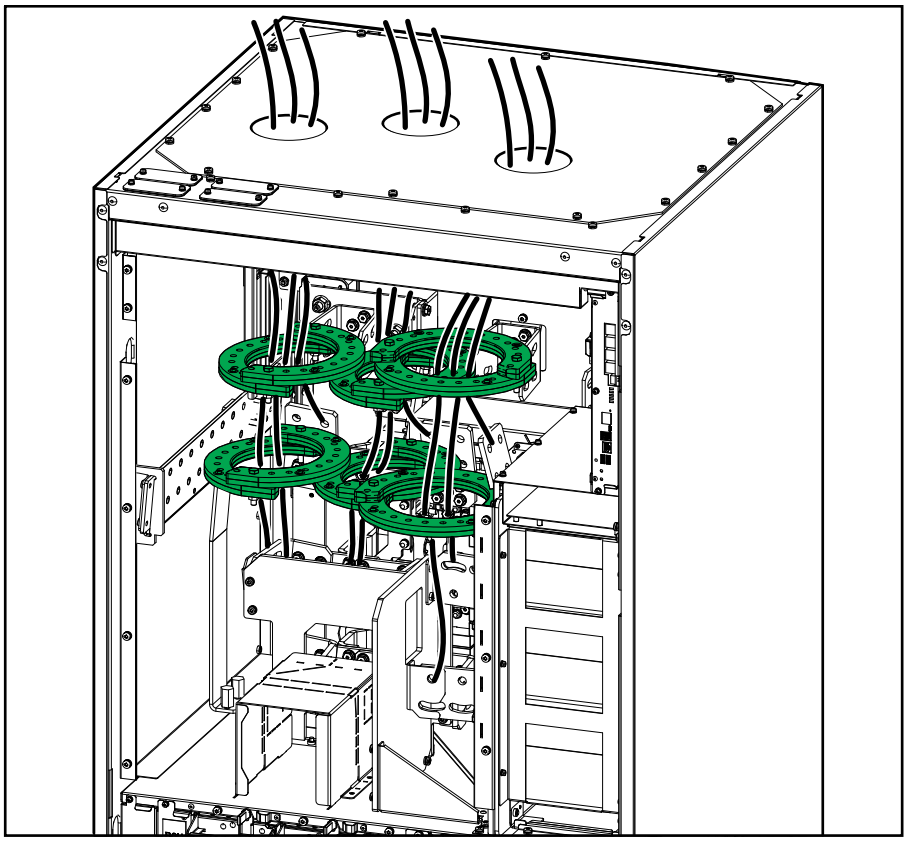
- Use the provided spring washers when connecting the cable lugs to the busbars as shown in the illustration.
- Connect one hole cable lugs and two hole cable lugs to the busbars as shown in the illustration.

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

8. Reinstall the plastic box in the original position.

9. Fasten the power cables with the provided plastic fasteners in the shown positions. Adjust the fasteners to the power cables so they are fitted tightly together.





10. Reinstall the transparent plastic protectors in the original position.
11. Reinstall the two power modules and the filler plate.

⚠CAUTION

RISK OF ELECTRIC SHOCK

The transparent plastic protectors and the plastic box must be reinstalled in the original position after power cabling is completed.

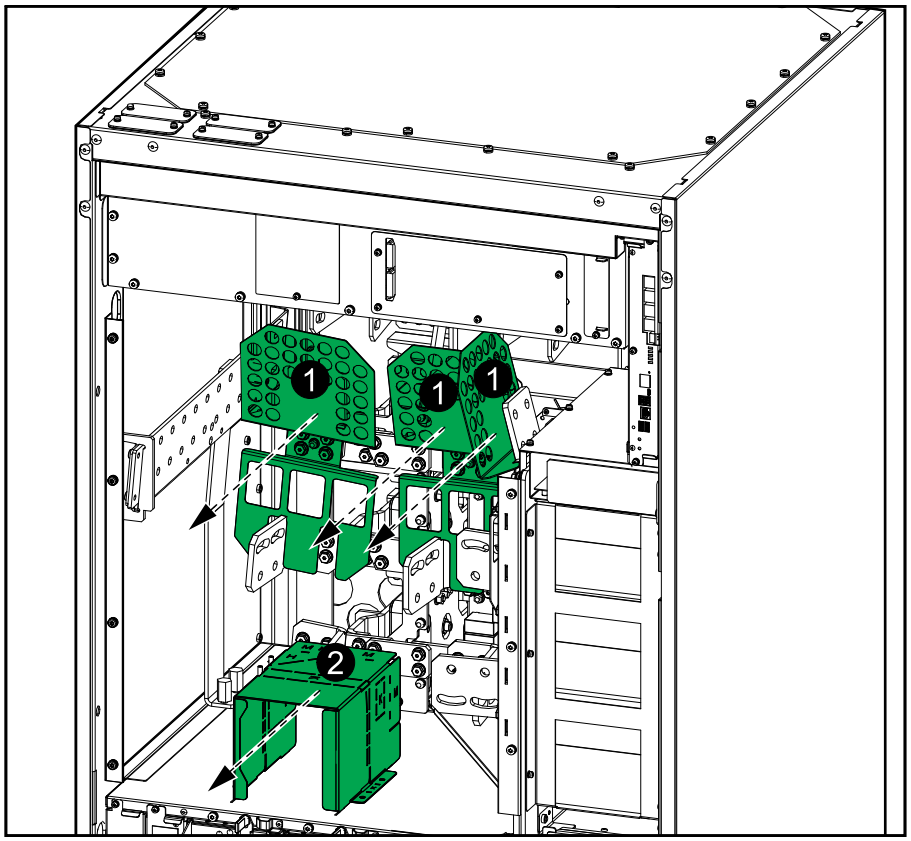
Failure to follow these instructions can result in injury or equipment damage.

Connect Power Cables in the UPS in System up to 45 kAIC/kA Icw

NOTE: If a backfeed kit (GVLOPT003 or GVLOPT004) is part of your installation, the backfeed kit must be installed **before** the power cables are connected in the UPS. Follow the installation manual provided with the backfeed kit.

NOTE: If a Li-Ion battery control breaker kit (GVLOPT005) is part of your installation, the Li-Ion battery control breaker kit must be installed **before** the power cables are connected in the UPS. Follow the installation manual provided with the Li-Ion battery control breaker kit.

1. Remove the transparent plastic protectors from the busbars. Save for reinstallation after cable connection.

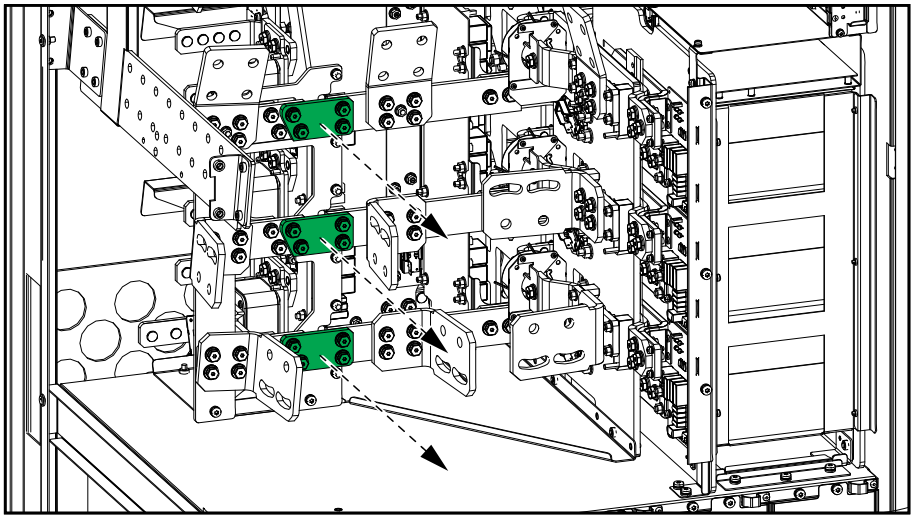


2. Remove the plastic box for easier access. Save for reinstallation after cable connection.

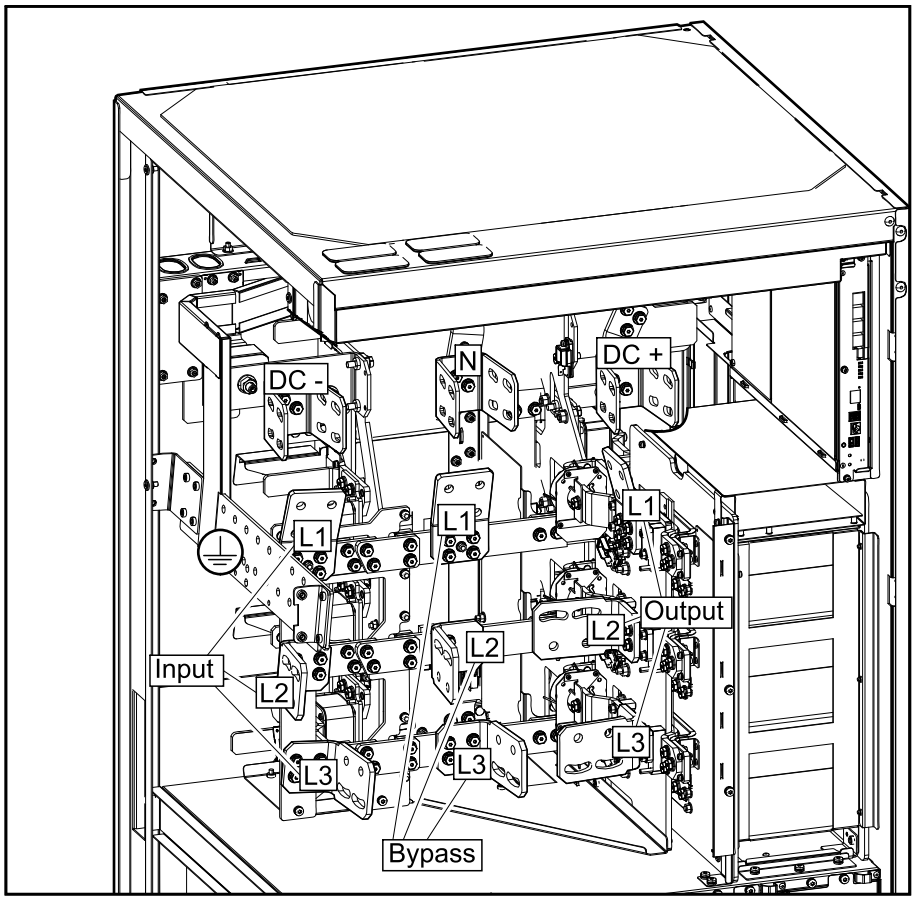
3. **Only for dual mains**: Remove the single mains busbars.

   NOTE: Save the three single mains busbars. They are needed for testing during start-up of the UPS.

Front View of the UPS



4. Connect the power cables in the described order. Assemble the cable lugs to the busbars as shown.



   a. Connect the PE cables/equipment grounding conductor (EGC).

   b. Connect the DC cables (DC+, DC-).

   c. Connect the input cables.

   d. **Only for dual mains**: Connect the bypass cables.

   e. Connect the output cables.

   f. **Only for 3-wire parallel system**: Connect the inverter midpoint cable to the neutral busbar. Daisy-chain the inverter midpoint cable between the neutral busbars in the UPSs in the parallel system. Add the provided danger label 885-92714 on the inner door of the UPS.

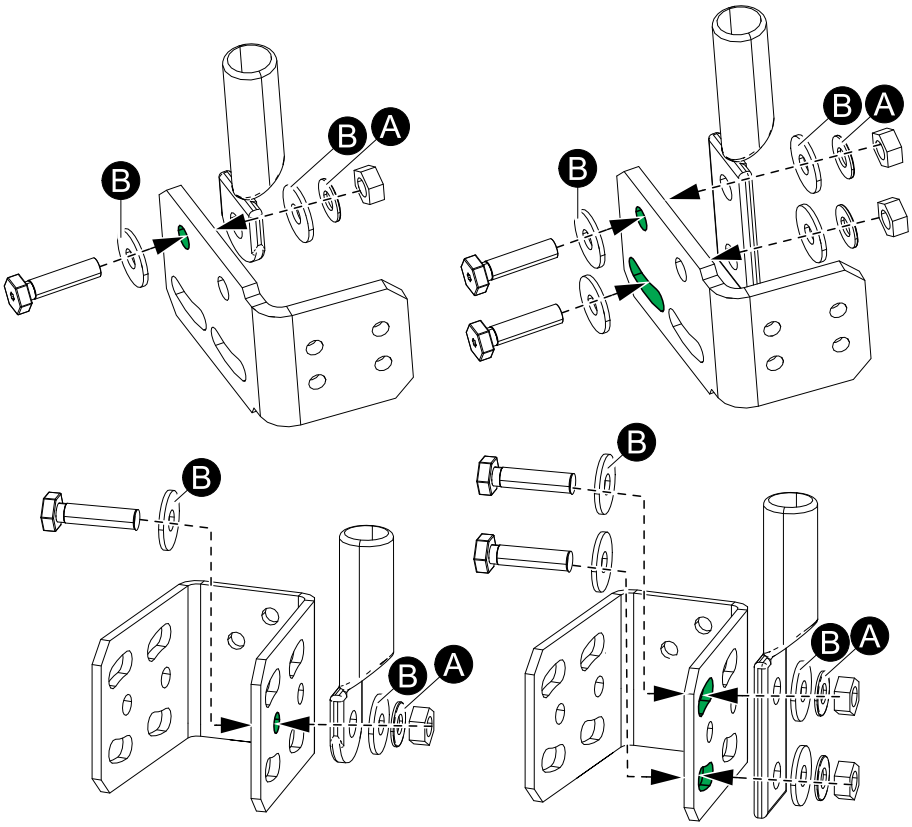
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Hard-wired inverter midpoint between the UPS systems is energized even when the UPS is isolated from the parallel system and completely shut down.
- Even if absence of voltage is measured, there can still be dangerous voltage transients on the neutral busbar.
- Entering the I/O terminal area requires full shutdown or the entire parallel system and transfer to maintenance bypass.

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

Cable Lug to Busbar Assembly



A. Spring washer – provided in kit.
B. Flat washer (not provided).

⚠CAUTION

RISK OF CABLE LUG DISCONNECTION

- Use the provided spring washers when connecting the cable lugs to the busbars as shown in the illustration.
- Connect one hole cable lugs and two hole cable lugs to the busbars as shown in the illustration.

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

5. Reinstall the transparent plastic protectors in the original position.
6. Reinstall the plastic box in the original position.

⚠CAUTION

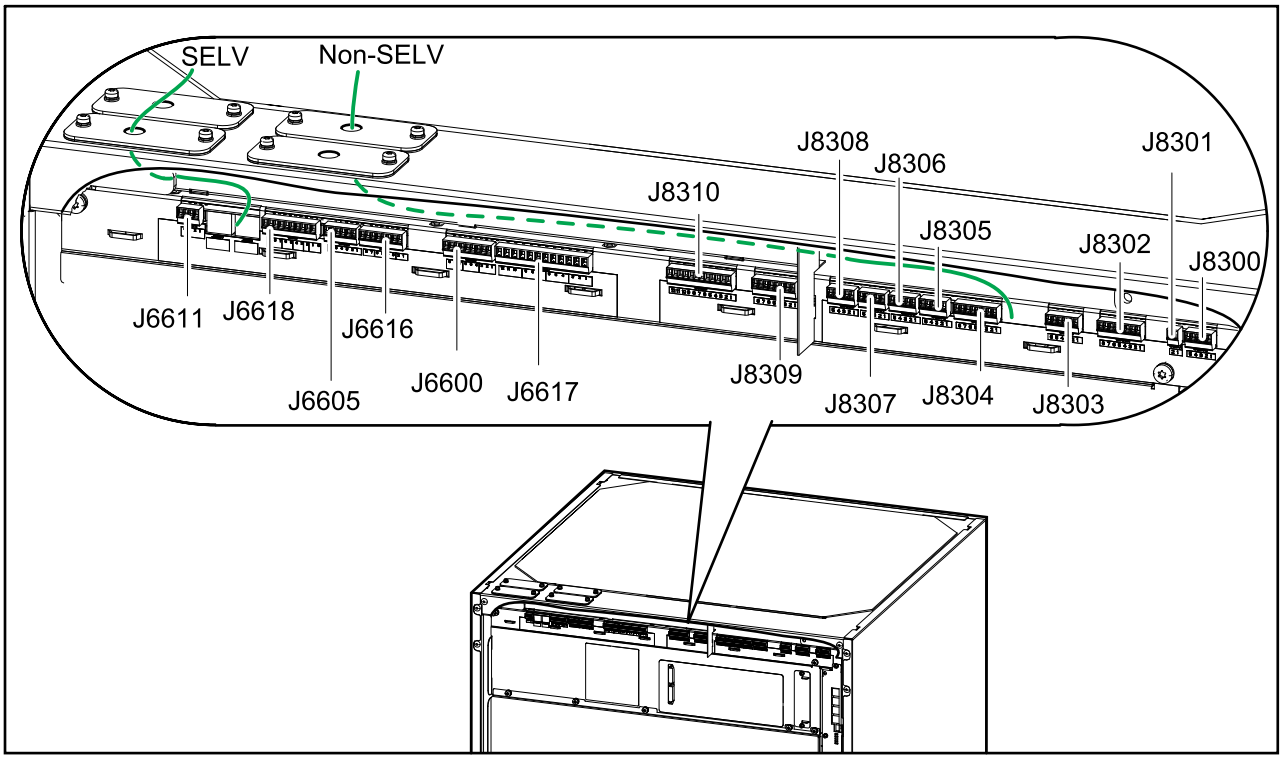
RISK OF ELECTRIC SHOCK

The transparent plastic protectors and the plastic box must be reinstalled in the original position after power cabling is completed.

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

Connect the Signal Cables

Overview of Signal Connection Terminals in the UPS



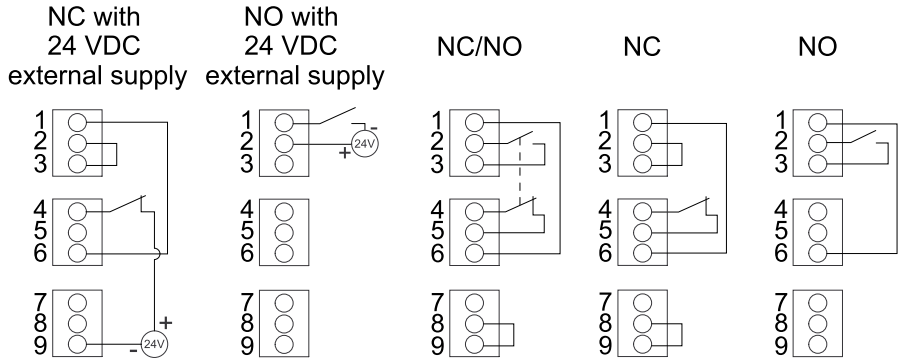
NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables. A divider inside the cable channel separates the cables.

Distance from UPS to equipment	Recommended signal cable size	
50 m (164 feet)	0.5 mm^2	20 AWG
100 m (328 feet)	0.75 mm^2	18 AWG
200 m (656 feet)	1 mm^2	17 AWG

1. Connect the Class 2/SELV signal cables from the building EPO to 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 (Terminal J6600, 1-9)



   The EPO input supports 24 VDC.

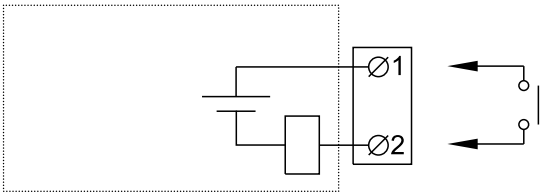
   NOTE: The default setting for the EPO activation is to turn off the inverter.

   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 to the input contacts and output relays in the UPS.

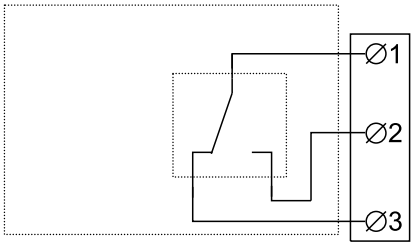
   Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.

   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	Terminal J6616, 1-2
IN _2 (input contact 2)		Terminal J6616, 3-4
IN _3 (input contact 3)		Terminal J6616, 5-6
IN _4 (input contact 4)		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	Terminal J6617, 1-3

Name	Description	Location
OUT _2 (output relay 2)		Terminal J6617, 4-6
OUT _3 (output relay 3)		Terminal J6617, 7-9
OUT _4 (output relay 4)		Terminal J6617, 10-12

3. Connect the signal cables from the auxiliary products to the UPS. Follow the instructions in the auxiliary product manuals.

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.

1. Install the temperature sensor provided with the UPS in the battery solution. In battery cabinets, install the temperature sensor in the top corner of the battery cabinet.

⚠WARNING

HAZARD OF FIRE

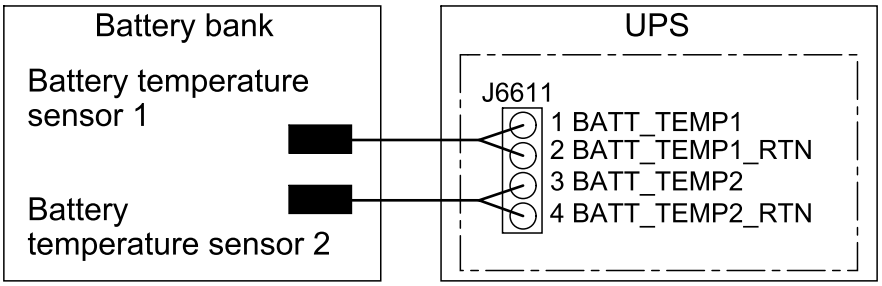
Position the temperature sensor as described to ensure correct temperature measurements.

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

2. Route the battery temperature sensor cables from the battery solution to the UPS and connect as shown.

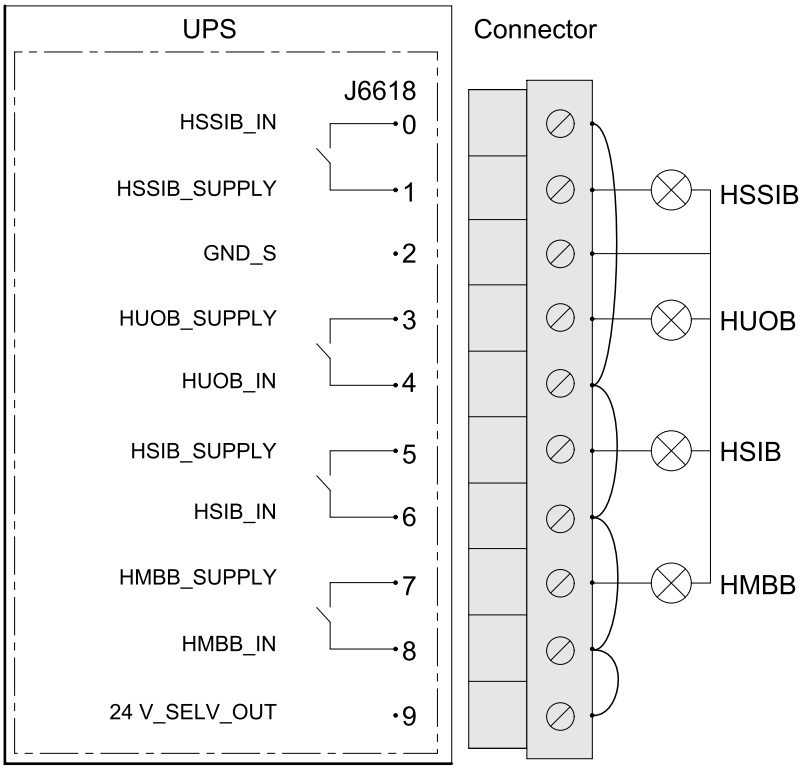
   NOTE: Two temperature sensors are provided with the UPS.

   NOTE: The battery temperature sensor cables are considered Class 2/SELV. Class 2/SELV circuits must be isolated from the primary circuitry.



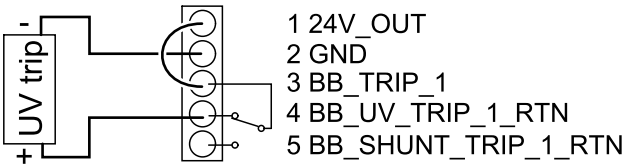
3. Connect signal cables from the breaker indicator lights in your switchgear to terminal J6618 in the top of the UPS. If an external supply is used, remove jumper from J6618 pin 8 and 9.

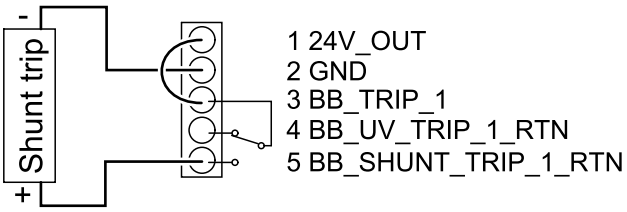
   NOTE: The breaker indicator light circuit is considered Class 2/SELV. Class 2/SELV circuits must be isolated from the primary circuitry. Do not connect any circuit to the breaker indicator light terminals unless it can be confirmed that the circuit is Class 2/SELV.



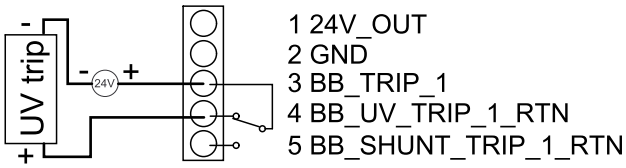
4. Connect the signal cables from the battery breaker(s) in your battery solution for shunt trip or undervoltage (UV) trip connection to the UPS. Follow the illustration for connection with internal or external 24 VDC supply. The UPS can connect to and monitor up to four battery breakers.
   a. Connect battery breaker 1 to terminal J8305 in the UPS.
   b. Connect battery breaker 2 to terminal J8306 in the UPS.
   c. Connect battery breaker 3 to terminal J8307 in the UPS.
   d. Connect battery breaker 4 to terminal J8308 in the UPS.

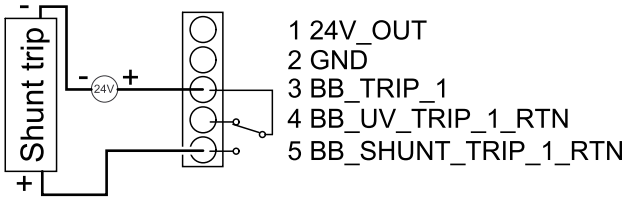
Battery Breaker Trip Connection with Internal 24 VDC Supply





Battery Breaker Trip Connection with External 24 VDC Supply

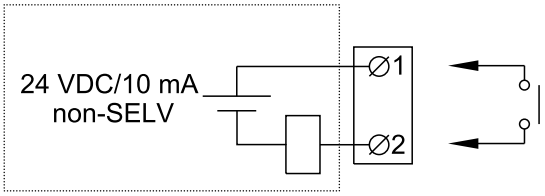




Supported Shunt

Current (A)	Time (ms)	Temperature
1.6	Continuous	20 °C (68 °F)
10	1300	20 °C (68 °F)
20	200	20 °C (68 °F)
30	60	20 °C (68 °F)

5. Connect signal cables from AUX switches in your switchgear to the UPS.

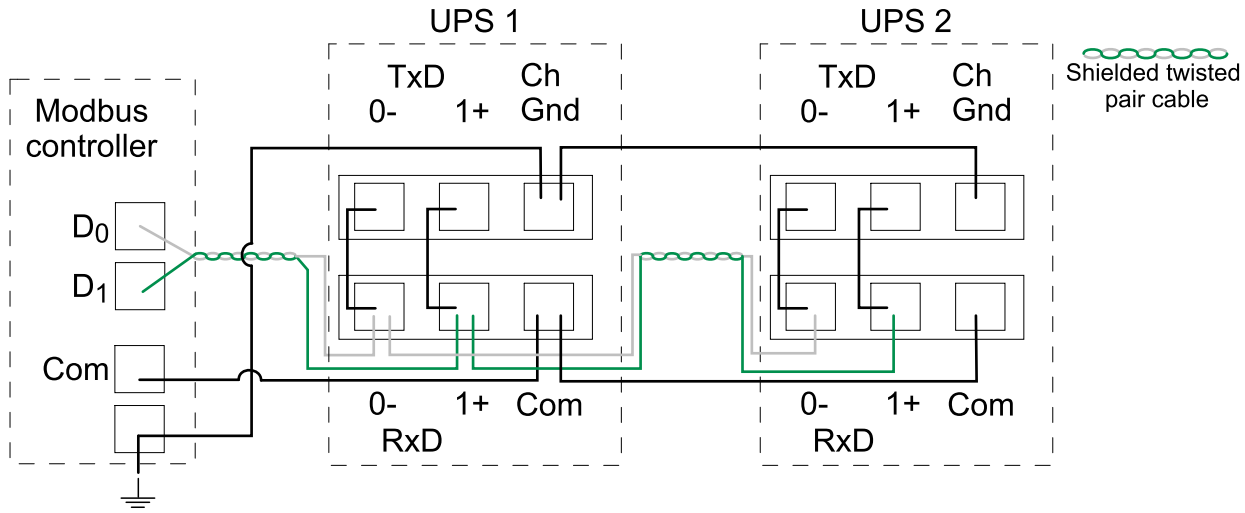


Terminal number	Function	Connection
J8303, 1-2	UOB_RED (redundant AUX switch in unit output breaker)	Connect to redundant AUX switch in unit output breaker UOB.
J8303, 5-6	SIB (system isolation breaker)	Connect to normally open (NO) AUX switch in system isolation breaker SIB for parallel system. SIB must contain an AUX switch for each connected UPS.
J8304, 1-2	BB1 (battery breaker 1)	Connect to normally open (NO) AUX switch in battery breaker number 1.
J8304, 3-4	BB2 (battery breaker 2)	Connect to normally open (NO) AUX switch in battery breaker number 2.
J8304, 5-6	BB3 (battery breaker 3)	Connect to normally open (NO) AUX switch in battery breaker number 3.
J8304, 7-8	BB4 (battery breaker 4)	Connect to normally open (NO) AUX switch in battery breaker number 4.
J8302, 7-8	UOB (unit output breaker)	Connect to normally open (NO) AUX switch in unit output breaker UOB.
J8302, 3-4	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.
J8302, 1-2	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.
J8302, 5-6	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.
J8300, 1-5	EXT BF (external backfeed breaker)	See Backfeed Protection, page 86.
J8301, 1-2	EXT BF RED (redundant power supply for external backfeed breaker)	See Backfeed Protection, page 86.

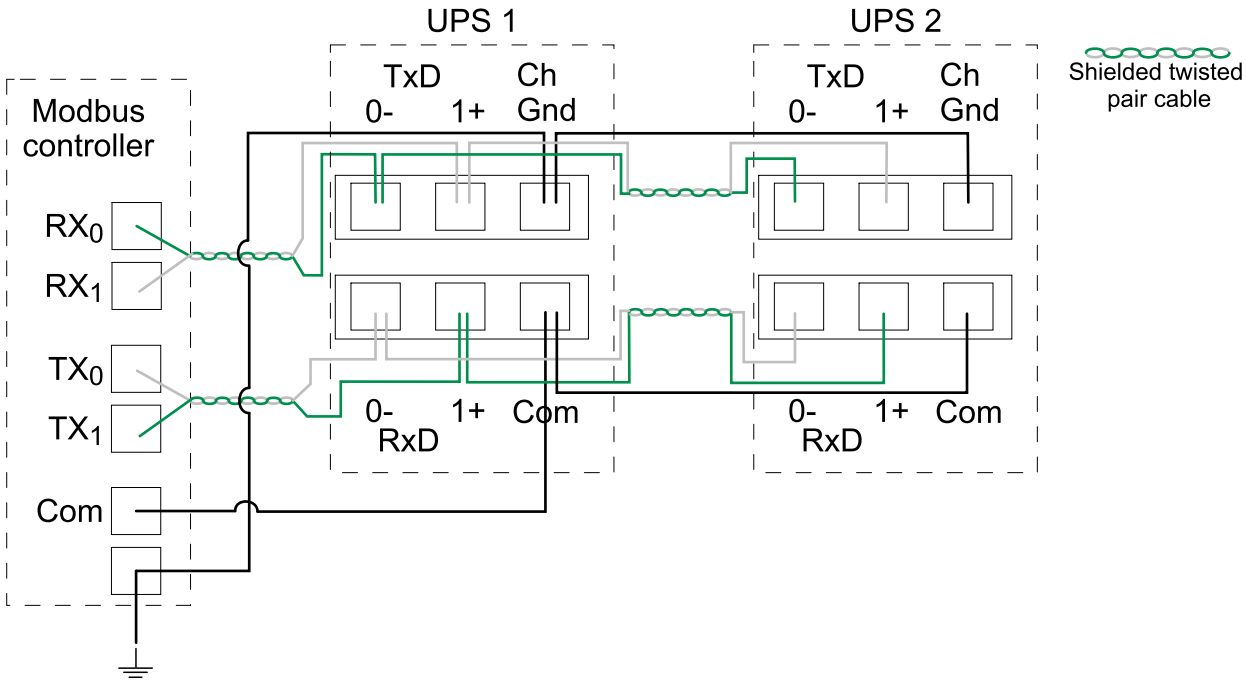
Connect the Modbus Cables

1. Connect the Modbus cables to the UPS(s). Use either 2-wire or 4-wire connection.
   - 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



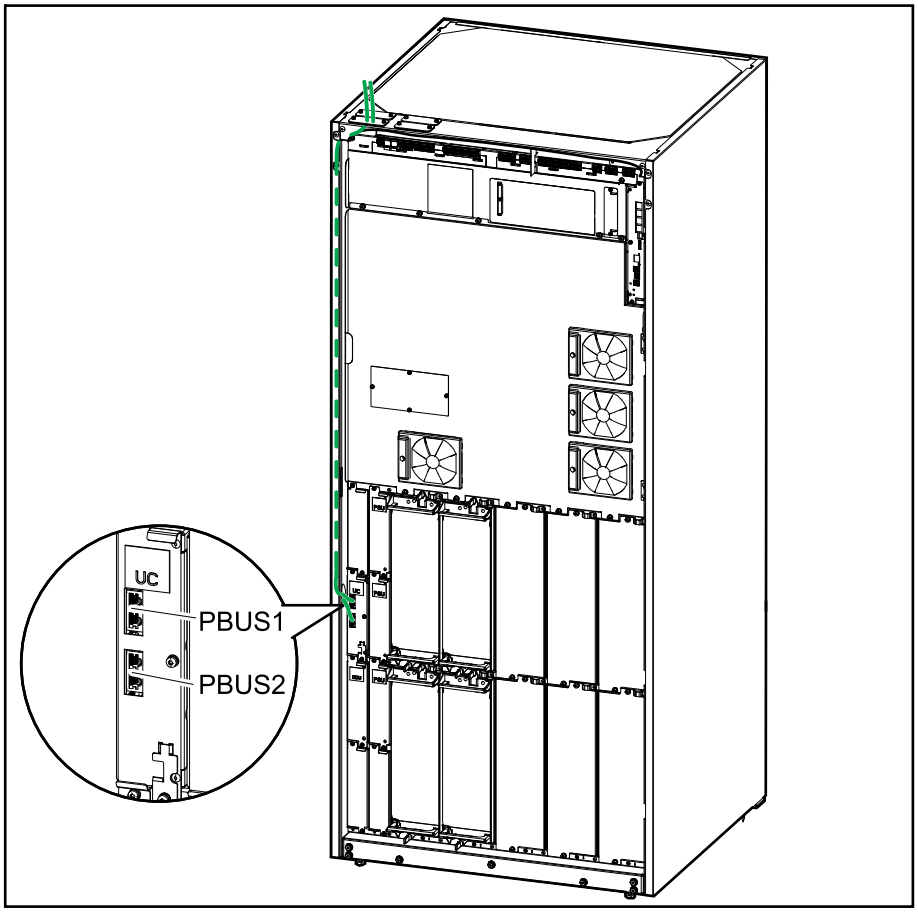
Example: 4-Wire Connection with Two UPSs



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.

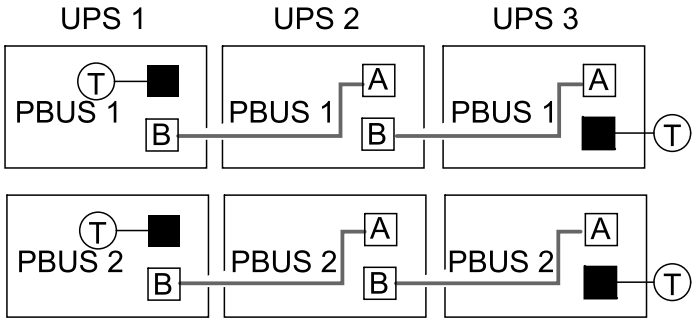
Connect the PBUS Cables

1. Connect the provided PBUS 1 (white) and PBUS 2 (red) cables to the PBUS ports on the UPSs.



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

Example of System with Three UPSs in Parallel



NOTE: The maximum acceptable length of PBUS cable between two parallel UPSs is 75 meter (246 feet). In case of configurations with up to six GVL UPSs in parallel, the combined length of all the PBUS cables from UPS 1 to UPS 6 must not exceed 75 meter (246 feet). Cable specifications: Patch cable SSTP CAT6: 22-26 AWG stranded bare copper, 4 twisted pairs, shielded cable with copper foil. Contact Schneider Electric for more information.

Connect the Signal Cables for External Synchronization

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

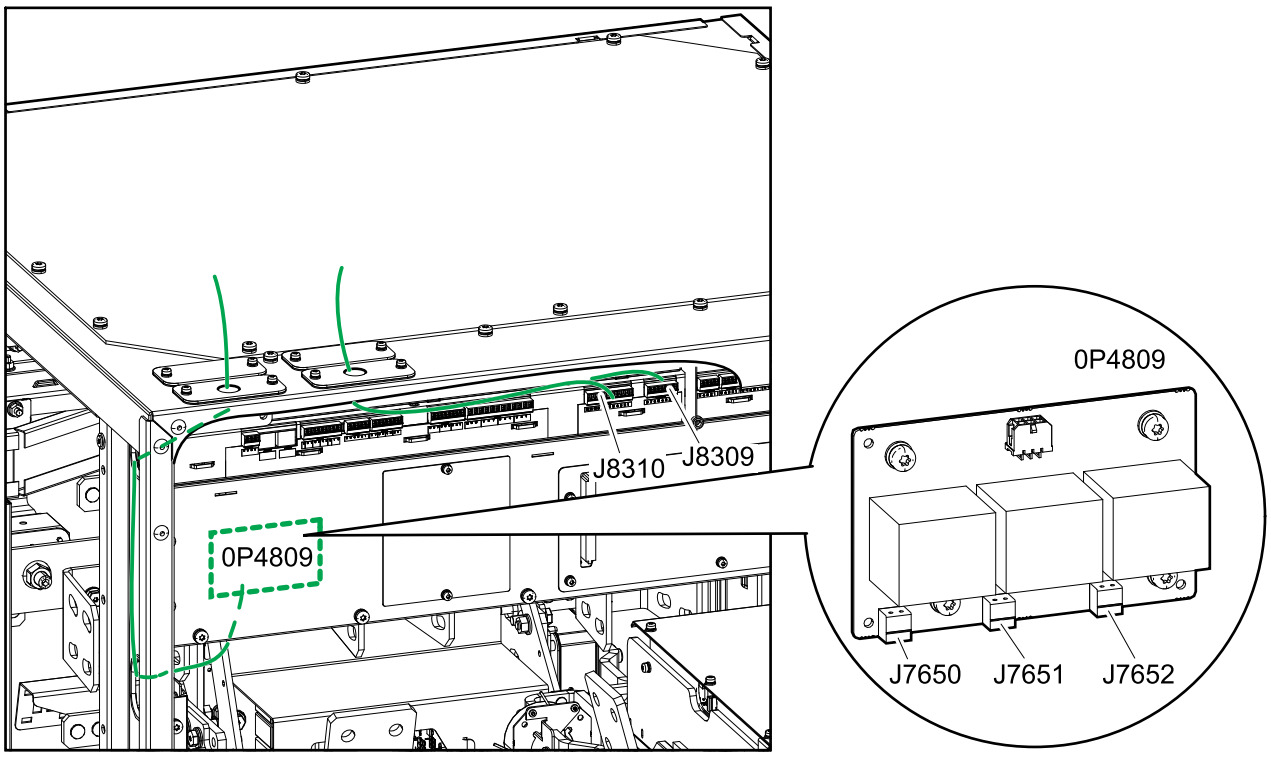
Check for absence of voltage for all three signal terminals on the external synchronization board 0P4809. When the external synchronization cables are installed, the terminals on the external synchronization board 0P4809 may be energized. Disconnect the fuse disconnector device at the source before removing the transparent protection cover.

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

Cable Size and Fuse Disconnector Device for External Synchronization

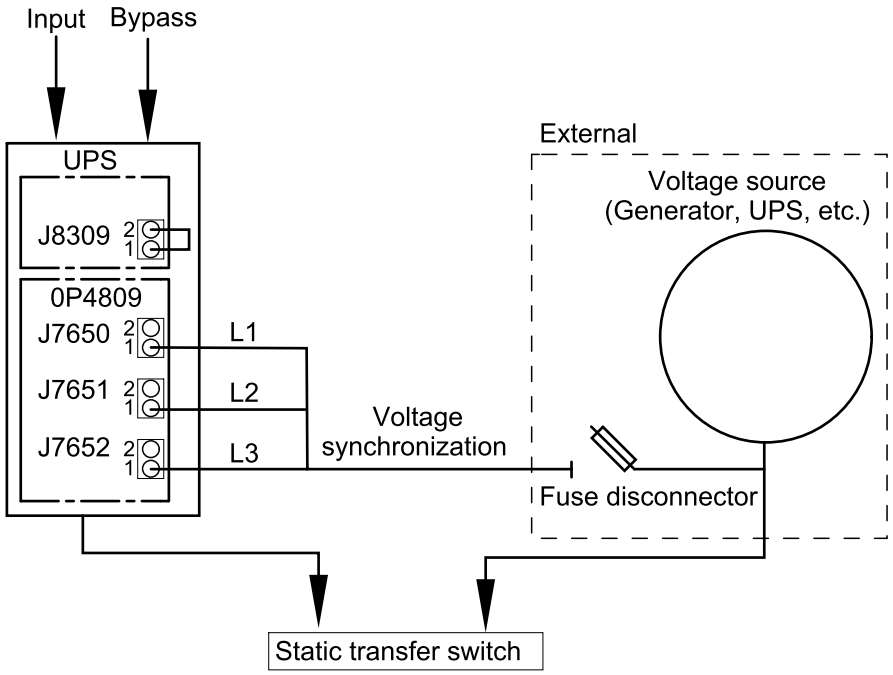
	Fuse and disconnector at source	Fuse disconnector marking	Cable size	Conduits
IEC	In = 2A, I.R=65 kAiC	Fuse disconnector identification number and external synchronization UPS number.	2 x 1.5 mm^2	–
UL/NEC			2 x 16 AWG	0.5 inch

1. Remove the transparent protection cover from the external synchronization board 0P4809. The external synchronization board 0P4809 is located on the rear of the front plate.
2. Connect the cables for external synchronization to the external synchronization board 0P4809 and to terminals J8309 and J8310. See cable routing on the illustration. Connect the external synchronization per your configuration according to one of the diagrams below. Ensure that fuse disconnector devices are installed at the source as shown in the diagrams.

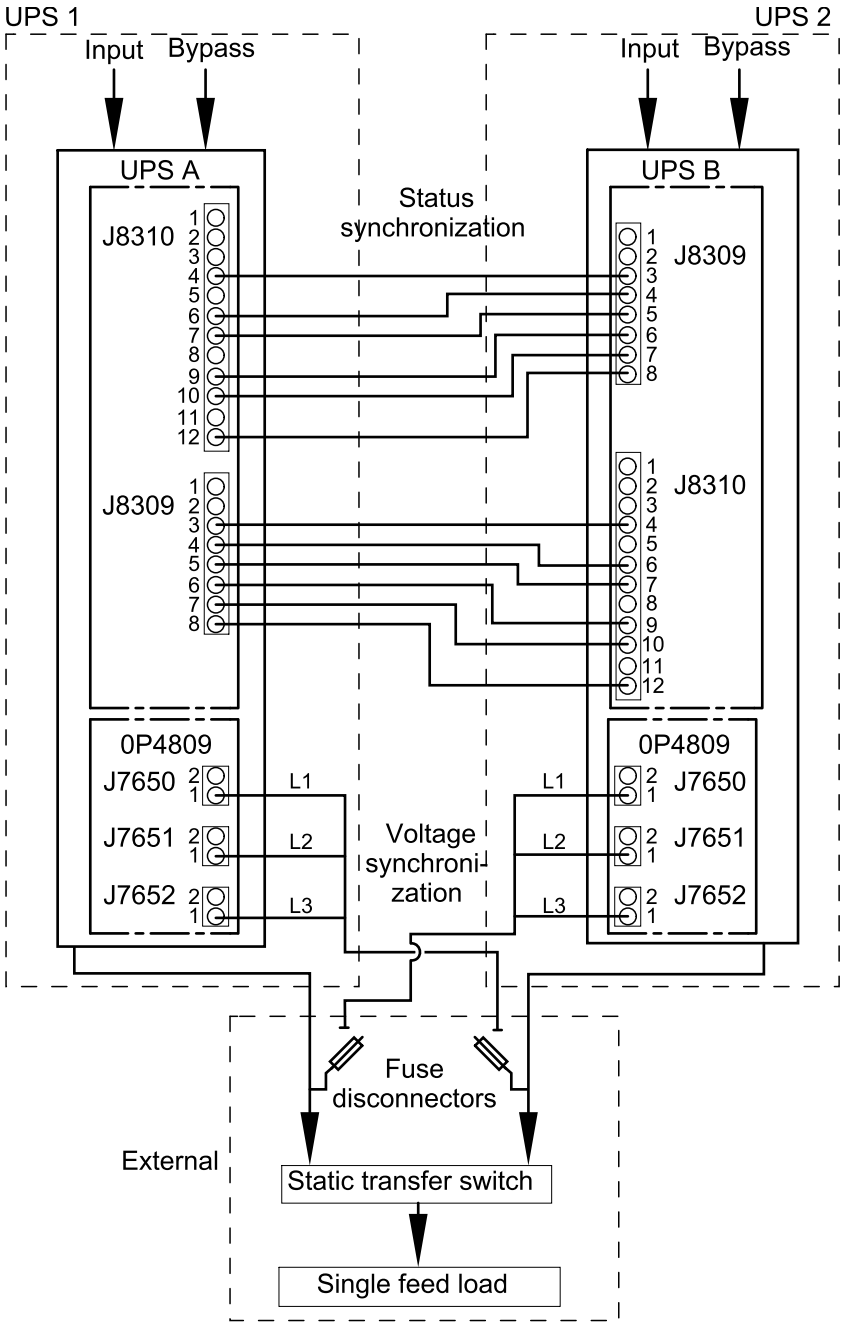


Signal Cable Connections for UPS Synchronization to a Fixed Voltage Source

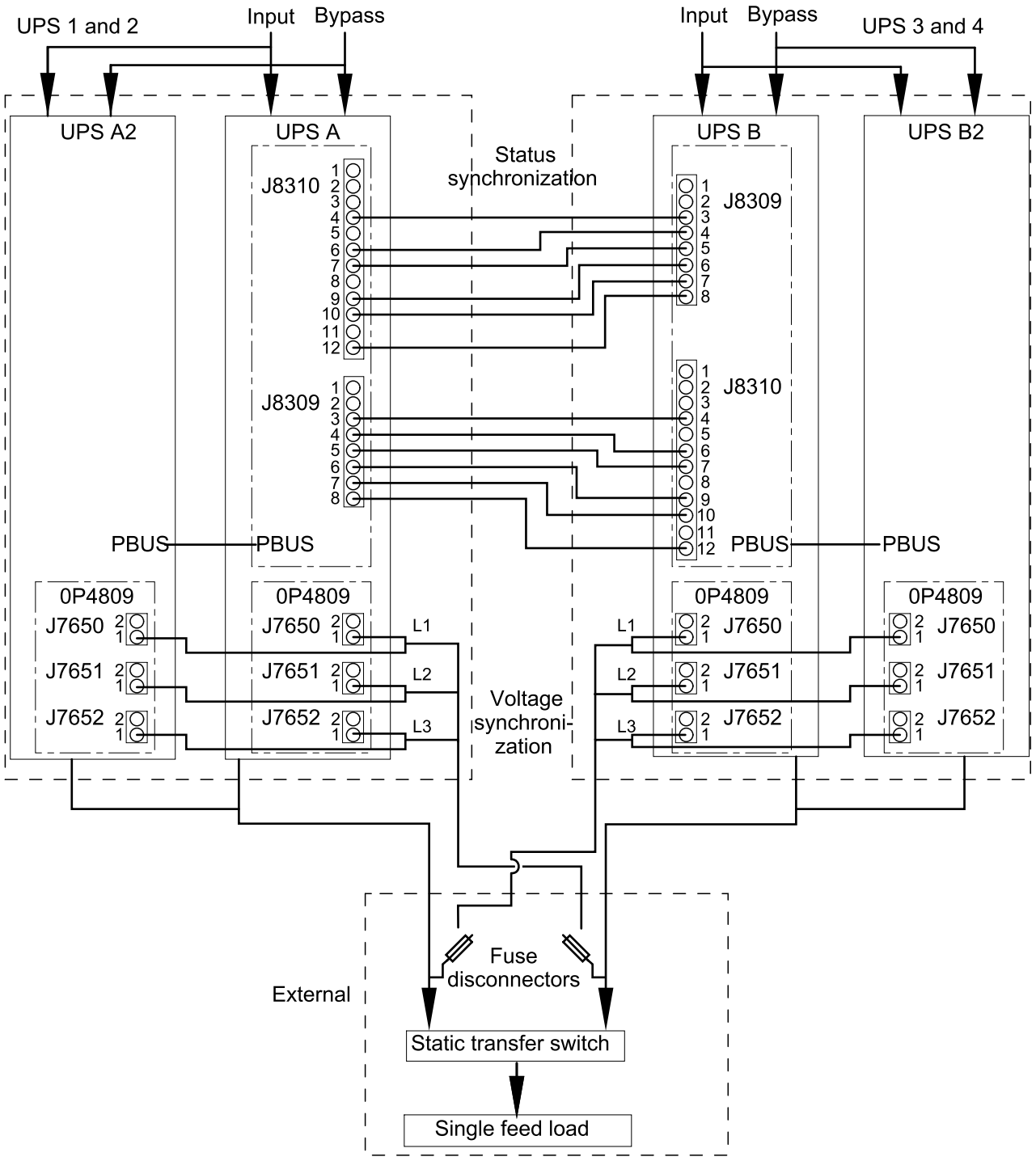
NOTE: The connection on J8309 pin 1 and 2 can be with a jumper or can be controlled externally from a PLC or another external system.



Signal Cable Connections for Advanced Dual UPS Synchronization



Signal Cable Connections for Advanced Dual UPS Synchronization in a Parallel UPS System with Fixed Sync Master



3. Reinstall the transparent protection cover on the external synchronization board 0P4809 after signal cabling is completed.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The transparent protection cover must be installed over the external synchronization board 0P4809.

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

4. Mark the transparent protection cover with the external synchronization fuse disconnector identification number.

Install the Power Module(s)

The UPS can arrive with or without preinstalled power modules. Additional power modules are shipped separately and must be installed to reach the correct UPS kW rating.

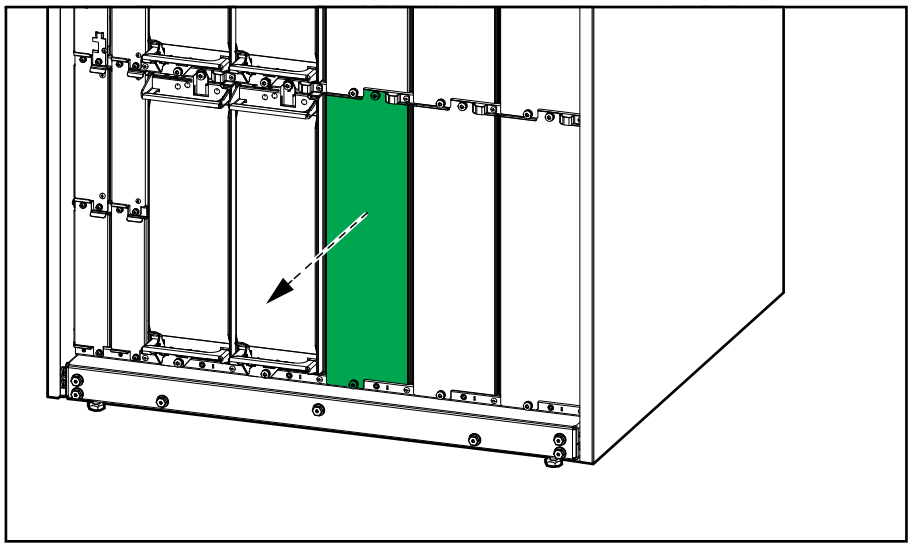
⚠CAUTION

HEAVY LOAD

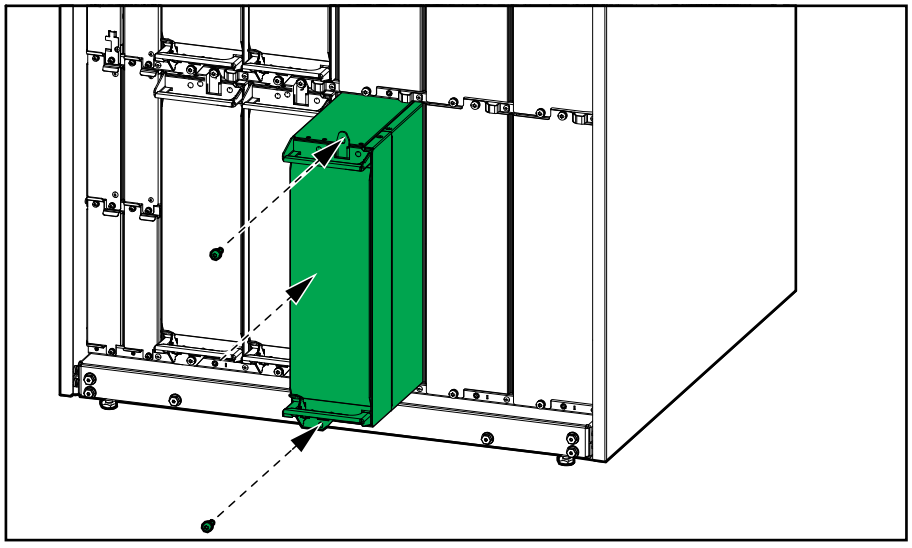
Power modules are heavy (38 kg (83.77 lbs)) and require two persons to lift.

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

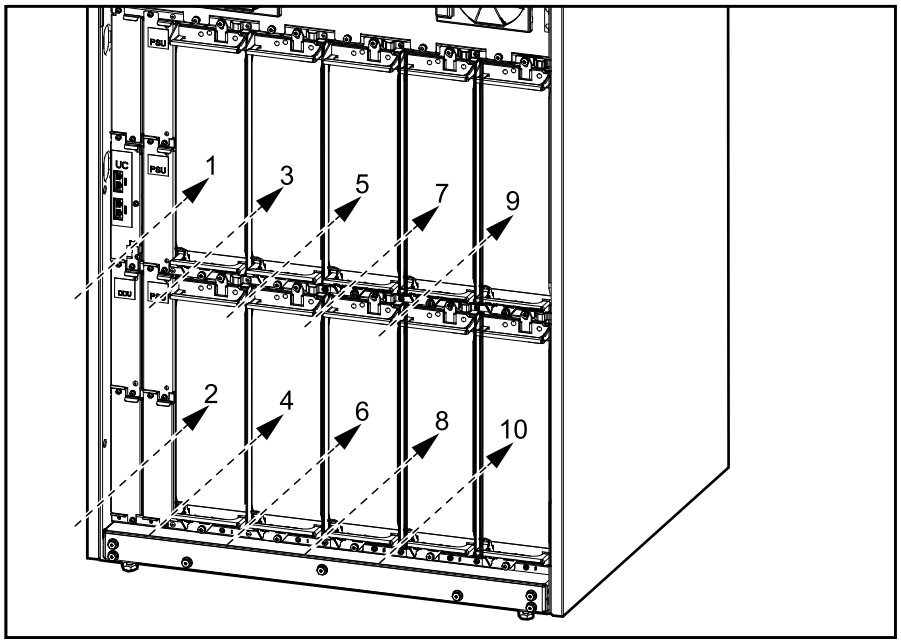
1. Remove the filler plate from the empty power module slot. Save the filler plate for future use.



2. Push the power module into the slot. The enable mechanism will latch when the power module is correctly inserted.
3. Install the provided screws in the top and the bottom of the power module.



Post-requisite: Install the power modules in the shown order from 1-10.


1
3
5
7
9
2
4
6
8
10

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.

Backfeed Protection

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Mandatory backfeed protection on bypass must be implemented by one of the following methods:

- Installation of upstream breaker with shunt trip connected to the UPS. See diagrams and instructions in Installation of Third Party Backfeed Protection, page 86.
- Installation of internal backfeed kit (GVLOPT003 or GVLOPT004) in the UPS. The internal backfeed kit must be installed **before** the power cables are connected in the UPS. Follow the installation manual provided with the internal backfeed kit.
- Installation of maintenance bypass cabinet (GVLMBCA200K500H or GVLMBCA200K500G) where the breaker is included. Follow the installation manual provided with the maintenance bypass cabinet. Label 885-91965 (provided with the UPS) must be placed visible on the maintenance bypass cabinet.

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

Installation of Third Party Backfeed Protection

Connect the breaker shunt trip and AUX switch to the UPS as shown below. Use double insulated cables. Breaker shunt trip must be rated for 24 VDC nominal, inrush max 100 W.

Label 885-91965 (provided with the UPS) must be placed visible at the bypass upstream breaker.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In systems where backfeed protection is not a part of the standard design, an automatic isolation device (Schneider Electric backfeed protection option or other device, such as a breaker, switch, or contactor with trip function, meeting the requirements of IEC62040-1 or UL1778 5th edition – depending on which standard apply to your local area), is required to be installed to prevent hazardous voltage or energy at the input terminals of the isolation device. The device must be rated and controlled according to the specifications in this manual.

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 remotely 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):

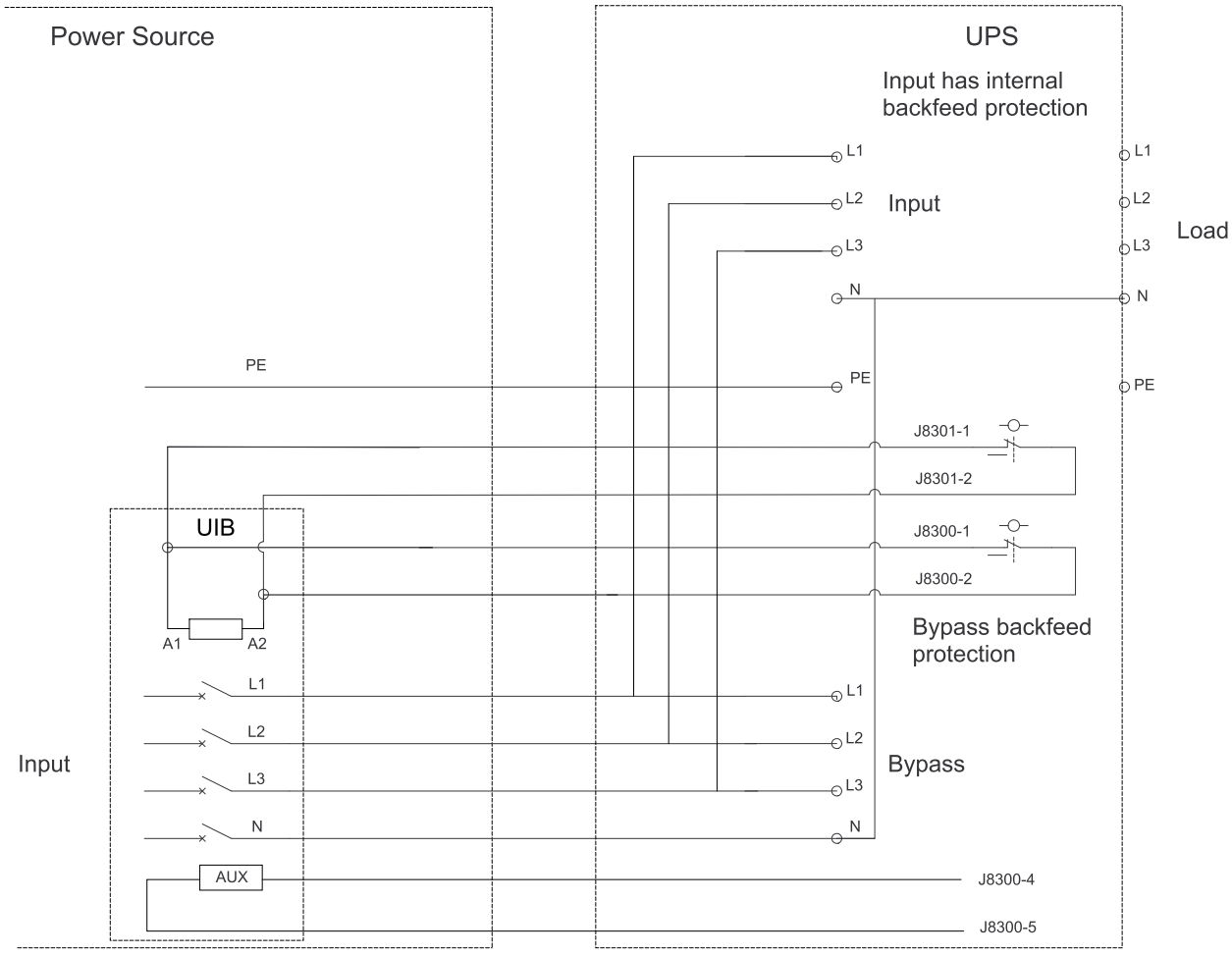
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

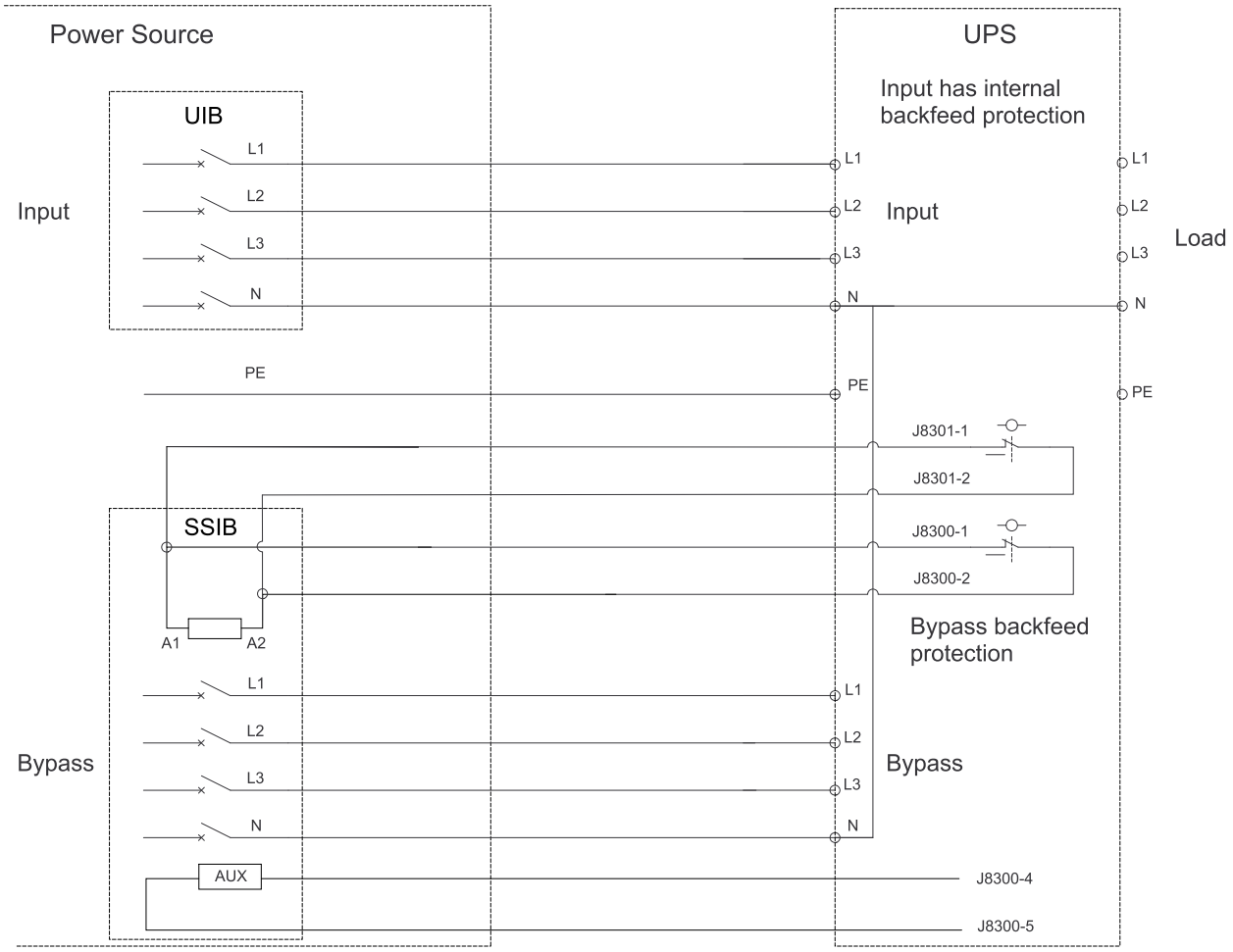
Risk of voltage backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth.

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

UPS and Third Party Backfeed Protection – Single Mains



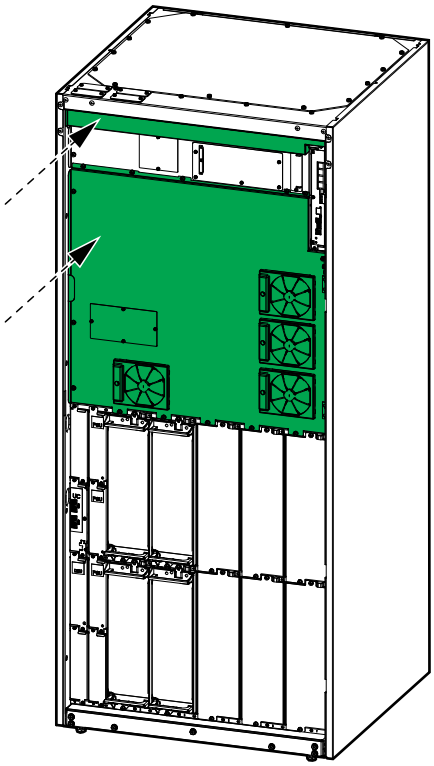
UPS and Third Party Backfeed Protection – Dual Mains



Final installation

1. Verify that the transparent plastic protectors and the plastic box (removed in Connect Power Cables in the UPS in System up to 45 kAIC/kA Icw, page 65 or Connect Power Cables in the UPS in System over 45 kAIC/kA Icw, page 58) have been reinstalled in their original position.
2. Verify that the transparent protection cover on the external sync board 0P4809 (removed in Connect the Signal Cables for External Synchronization, page 79) has been reinstalled in its original position.
3. Close the inner door and fasten with screws.
4. Reinstall the cover over the signal connections.

Front View of the UPS

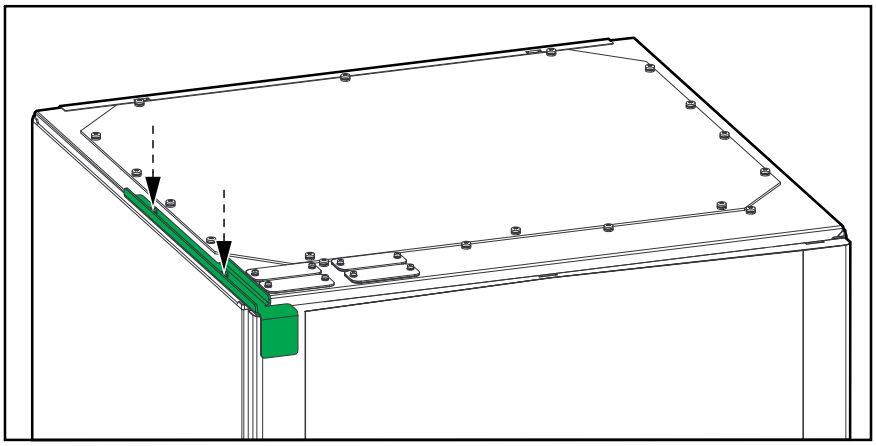


5. On the label 885-91896 on the front of the UPS, mark the short circuit rating relevant for this UPS system depending on installed auxiliaries and options.

	65 kAIC/kA Icw (UPS alone)
	65 kAIC with GVLMBCA200K500G (UPS with maintenance bypass cabinet for UL)
	45 kAIC/kA Icw with GVBEC (UPS with bottom entry cabinet)
	45 kAIC/kA Icc with GVLOPT003/GVLOPT004 installed (UPS with backfeed kit for UL/ backfeed kit for IEC installed)
	25 kA Icw with GVLMBCA200K500H (UPS with maintenance bypass cabinet for IEC)

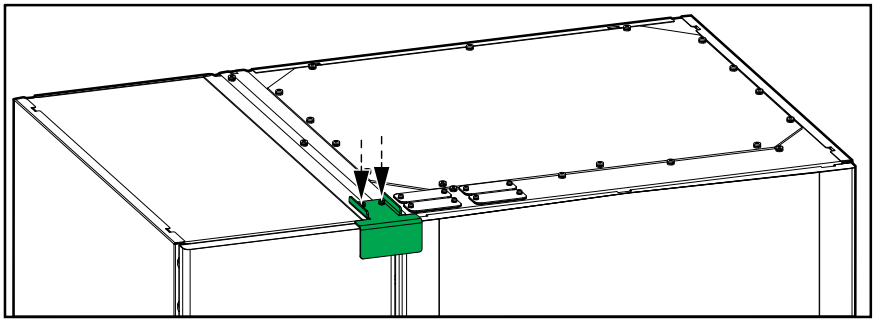
6. **Only for seismic anchoring**: Close the front door(s) and perform one of the following:
   – For UPS alone, install the provided seismic top bracket 870-18110 in the top left side of the UPS.

The UPS



   – For UPS with maintenance bypass cabinet or bottom entry cabinet, install the provided seismic top bracket 870-51238 between the two cabinets.

The Bottom Entry Cabinet/Maintenance Bypass Cabinet and the UPS



Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

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

990-91380F-001