Galaxy VL 1600-2000 kW UPS System

Installation

Latest updates are available on the Schneider Electric website 10/2025





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Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a "Danger" or "Warning" safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

ADANGER

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.

AWARNING

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.

ACAUTION

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: The individual equipment in this UPS system have 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.

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.

ADANGER

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.

ADANGER

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.

ADANGER

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 disconnect devices, battery disconnect devices, 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.

A 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.

ADANGER

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.

ADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR 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 will result in death or serious injury.

ACAUTION

RISK OF HOT SURFACE

The outer plates of the cabinet can exceed temperatures of 65 °C (149 °F) at 50 °C (122 °F) ambient room temperature, if the air filter(s) in the front door is clogged. Replace the air filter regularly as described in the UPS operation manual.

Failure to follow these instructions can result in 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

AADANGER

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.

AADANGER

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 system 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
 system to allow the capacitors to discharge.
- The UPS system must be properly earthed/grounded and due to a high touch current/leakage current, the earthing/grounding conductor must be connected first.

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

The label below must be added if:

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

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

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Risk of voltage backfeed. Before working on this circuit: Isolate the entire UPS system and check for hazardous voltage between all terminals including the protective earth. The individual UPS cabinets cannot be isolated.

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

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Isolate the entire UPS system and check for hazardous voltage between all terminals including the protective earth before working on the UPS system. The individual UPS cabinets cannot be isolated.

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

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AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Always perform correct Lockout/Tagout before working on the UPS system. A UPS system with autostart enabled will automatically restart when the mains supply returns.

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

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

Battery Safety

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Battery disconnect devices 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.

AADANGER

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.

AADANGER

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.

ACAUTION

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 documentation from the battery manufacturer concerning battery storage, battery installation, and battery maintenance.

Specifications

1600 kW Specifications

	Voltage (V)	415	480	
	Connections	Single mains: 4-wire ⁽¹⁾ (L1, L2, L3 3-wire ⁽¹⁾ (L1, L2, L3, G)	, N, G) or	
	Input voltage range (V)	353-477	408-552	
	Frequency (Hz)	40-70		
	Nominal input current (A)	2308	1988	
<u> </u>	Maximum short circuit rating (three cycles)	65 kAIC		
Input	Maximum input current (A)	2816	2428	
	Input current limitation (A)	2928	2504	
	Total harmonic distortion (THDI)	<5% at 100% load		
	Input power factor	0.99 at 100% load		
	Protection	Built-in backfeed protection and fu	uses for each UPS	
	Ramp-in	Adaptive 1-300 seconds		
	Bypass voltage range (V)	374-457	432-528	
	Frequency (Hz)	50 or 60		
ဟ္	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.		
Bypass	Nominal bypass current (A)	2288	1976	
a	Maximum short circuit rating (three cycles)	65 kAIC		
	I2t thyristor value (A2s)	3.1 MA ² s		
	Bypass backfeed protection options	Built-in backfeed circuit breaker B	F2 in each UPS	
	Connections ⁽²⁾	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 mir continuous ⁽⁴⁾) Battery operation: 125% for 1 min Bypass operation: 125% continuous	ute	
l =	Output power factor	1		
Output	Nominal output current (A)	2224	1924	
	Output frequency (Hz)	50/60 (synchronized to bypass), 5	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 ⁽⁵⁾		
	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	

WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not permitted. The number of output connections must match the number of input connections.

Per NEC 250.30.

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^{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.

THDU values are measured at the output busbars/terminals of the single UPS.

	Voltage (V)	415	480	
	Maximum charging power (kW)	0-40% load: 80% 100% load: 20%		
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks		
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks		
tery	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks		
v bati	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C	for T < 25 °C	
VRLA battery	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)	3472		
	Battery current at full load and minimum battery voltage (A)	4340		
	Ripple current	< 5% C20 (5 minute runtime)		
	Maximum short circuit rating	30 kA		
	Charging power in % of output power	0-40% load: 80% 100% load: 20%		
<u>5</u>	Maximum charging power (kW)	0-40% load: 1280 100% load: 320		
batte	Nominal battery voltage (VCD) at 3.8 V per cell	517 V (LIBSESMG17UL)		
ion	Float charge voltage (VCD) at 4.2 V per cell	571 V (LIBSESMG17UL)		
Lithium-ion battery	End of discharge voltage (VCD) at 3.0 V per cell	408 V (LIBSESMG17UL)		
Ė	Battery current at full load and nominal battery voltage (A)	3224		
	Battery current at full load and minimum battery voltage (A)	4085		
	Maximum short circuit rating	30 kA		

NOTE: Lithium-ion battery specifications are based on the Galaxy Lithium-ion battery cabinet (LIBSESMG17UL). The battery solution for the 1600 kW UPS system consists of minimum 8 and maximum 10 Galaxy Lithium-ion battery cabinets (LIBSESMG17UL).

1800 kW Specifications

	Voltage (V)	415	480	
	Connections	Single mains: 4-wire ⁽⁶⁾ (L1, L2, L3, N, G) or 3-wire ⁽⁶⁾ (L1, L2, L3, G)		
	Input voltage range (V)	353-477	408-552	
	Frequency (Hz)	40-70		
	Nominal input current (A)	2596	2236	
=	Maximum short circuit rating (three cycles)	65 kAIC		
Input	Maximum input current (A)	3168	2728	
	Input current limitation (A)	3296	2820	
	Total harmonic distortion (THDI)	<5% at 100% load		
	Input power factor	0.99 at 100% load		
	Protection	Built-in backfeed protection and fuses for each UPS	3	
	Ramp-in	Adaptive 1-300 seconds		
	Bypass voltage range (V)	374-457	432-528	
	Frequency (Hz)	50 or 60		
v	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.		
Bypass	Nominal bypass current (A)	2572	2224	
æ	Maximum short circuit rating (three cycles)	65 kAIC		
	I2t thyristor value (A2s)	3.1 MA ² s		
	Bypass backfeed protection options	Built-in backfeed circuit breaker BF2 in each UPS		
	Connections ⁽⁷⁾	4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC ⁽⁸⁾)		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 150% for 1 minute, 125% for 10 (9)) Battery operation: 125% for 1 minute Bypass operation: 125% continuous	minutes, (110% continuous	
1	Output power factor	1		
Output	Nominal output current (A)	2504	2164	
0	Output frequency (Hz)	50/60 (synchronized to bypass), 50/60 Hz ±0.1% (f	ree-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 ⁽¹⁰⁾		
	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		

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WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not permitted. The number of output connections must match the number of input connections.

Per NEC 250.30.

^{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.

⁽¹⁰⁾ THDU values are measured at the output busbars/terminals of the single UPS.

	Voltage (V)	415	480	
	Maximum charging power (kW)	0-40% load: 80% 100% load: 20%		
	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		
atter	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C for T < 25 °C		
VRLA battery	End of discharge voltage (full load) (VDC)	384		
X	End of discharge voltage (no load) (VDC)	420		
	Battery current at full load and nominal battery voltage (A)	3908		
	Battery current at full load and minimum battery voltage (A)	4884		
	Ripple current	< 5% C20 (5 minute runtime)		
	Maximum short circuit rating	30 kA		
	Charging power in % of output power	0-40% load: 80% 100% load: 20%		
	Maximum charging power (kW)	0-40% load: 1440 100% load: 360		
ttery	Nominal battery voltage (VCD) at 3.8 V per cell	517 V (LIBSESMG17UL)		
n baí	Float charge voltage (VCD) at 4.2 V per cell	571 V (LIBSESMG17UL)		
m-io	End of discharge voltage (VCD) at 3.0 V per cell	408 V (LIBSESMG17UL)		
Lithium-ion battery	Battery current at full load and nominal battery voltage (A)	3627		
	Battery current at full load and minimum battery voltage (A)	4596		
	Maximum short circuit rating	30 kA		

NOTE: Lithium-ion battery specifications are based on the Galaxy Lithium-ion battery cabinet (LIBSESMG17UL). The battery solution for the 1800 kW UPS system consists of minimum 9 and maximum 10 Galaxy Lithium-ion battery cabinets (LIBSESMG17UL).

2000 kW Specifications

	Voltage (V)	415	480	
	Connections	Single mains: 4-wire(11) (L1, L2, L 3-wire(11) (L1, L2, L3, G)	3, N, G) or	
	Input voltage range (V)	353-477	408-552	
	Frequency (Hz)	40-70		
	Nominal input current (A)	2884	2484	
 	Maximum short circuit rating (three cycles)	65 kAIC		
Input	Maximum input current (A)	3520	3032	
	Input current limitation (A)	3660	3132	
	Total harmonic distortion (THDI)	<5% at 100% load		
	Input power factor	0.99 at 100% load		
	Protection	Built-in backfeed protection and f	uses for each UPS	
	Ramp-in	Adaptive 1-300 seconds		
	Bypass voltage range (V)	374-457	432-528	
	Frequency (Hz)	50 or 60		
v	Frequency range (Hz)	Programmable: ±1, ±3, ±10. Default is ±3.		
Bypass	Nominal bypass current (A)	2860	2472	
œ.	Maximum short circuit rating (three cycles)	65 kAIC		
	I2t thyristor value (A2s)	3.1 MA ² s		
	Bypass backfeed protection options	Built-in backfeed circuit breaker E	BF2 in each UPS	
	Connections(12)	4-wire (L1, L2, L3, N, G) or 3-wire (L1, L2, L3, G, GEC ⁽¹³⁾)		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 150% for 1 mir continuous ⁽¹⁴⁾) Battery operation: 125% for 1 mir Bypass operation: 125% continuo		
1	Output power factor	1		
Output	Nominal output current (A)	2784	2404	
0	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 ⁽¹⁵⁾		
	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	

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⁽¹¹⁾ WYE source – solid grounded and high resistance grounded sources are supported. Corner (line) grounding is not permitted.
(12) The number of output connections must match the number of input connections.
(13) Per NEC 250.30.
(14) 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.

⁽¹⁵⁾ THDU values are measured at the output busbars/terminals of the single UPS.

	Voltage (V)	415	480	
	Maximum charging power (kW)	0-40% load: 80% 100% load: 20%		
	Nominal battery voltage (VDC)	480 for 40 blocks 576 for 48 blocks		
	Nominal float voltage (VDC)	545 for 40 blocks 654 for 48 blocks		
tery	Maximum boost voltage (VDC)	571 for 40 blocks 685 for 48 blocks		
\ bat	Temperature compensation (per cell)	-3.3mV/°C for T ≥ 25 °C, 0mV/°C	for T < 25 °C	
VRLA battery	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)	4340		
	Battery current at full load and minimum battery voltage (A)	5424		
	Ripple current	< 5% C20 (5 minute runtime)		
	Maximum short circuit rating	30 kA		
	Charging power in % of output power	0-40% load: 80% 100% load: 20%		
ŗ	Maximum charging power (kW)	0-40% load: 1600 100% load: 400		
batte	Nominal battery voltage (VCD) at 3.8 V per cell	517 V (LIBSESMG17UL)		
Lithium-ion battery	Float charge voltage (VCD) at 4.2 V per cell	571 V (LIBSESMG17UL)		
nium	End of discharge voltage (VCD) at 3.0 V per cell	408 V (LIBSESMG17UL)		
Lit	Battery current at full load and nominal battery voltage (A)	4030		
	Battery current at full load and minimum battery voltage (A)	5106		
	Maximum short circuit rating	30 kA		

NOTE: Lithium-ion battery specifications are based on the Galaxy Lithium-ion battery cabinet (LIBSESMG17UL). The battery solution for the 2000 kW UPS system consists of 10 Galaxy Lithium-ion battery cabinets (LIBSESMG17UL).

Upstream and Downstream Protection for UL

Preconditions for Live Swap of Power Modules

Live Swap of power modules is only allowed under the following preconditions for the UPS system installation:

- Circuit breaker must be installed for input (unit input disconnect device UIB).
- Circuit breaker (UIB) must be equipped with NEC 240.87, NFPA70E, IEEE1584, or EN51110-1 compliant ERMS mode.
- GVLOPT011 (Galaxy VL door switch kit) must be installed in all four UPSs in the UPS system and connected so ERMS mode is set to ON on UIB when the front door of any of the UPSs is opened.
- In ERMS mode, the instantaneous trip current shall be set to 5000 A or less. All time-delay settings shall be set to zero.

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

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HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Only perform Live Swap of the power modules in UPS system installations that follow the preconditions listed above.

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

Recommended Upstream and Downstream Protection for UL

The output breakers are sized based on the nominal current +10%. This is to accommodate either low grid voltage or deviation in cable length between parallel UPSs. The battery breakers are sized based on the end-of-discharge voltage which has been defined as 380 VDC.

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

415 V UPS System

UPS rating	1600 kW		1800 kW		2000 kW	
	Input	Bypass/output	Input	Bypass/output	Input	Bypass/output
Circuit breaker type	NW30H / MTZ2 30H / MTZ3-40	NW30H / MTZ2 30H / MTZ3-40	NW40H / MTZ2 40H / MTZ3-40	NW30H / MTZ2 30H / MTZ3-40	NW40H / MTZ2 40H / MTZ3-40	NW32H/MTZ2 32H / MTZ3-40
Ir	3000	2700	3600	2800	3600	3200
tr	≥4	≥4	≥4	≥4	≥4	≥4
li (x ln)	≤5	≤5	≤5	≤5	≤5	≤5

480 V UPS System

UPS rating	ing 1600 kW 1800 kW		1600 kW			2000 kW	
	Input	Bypass/output	Input	Bypass/output	Input	Bypass/output	
Circuit breaker type	NW30H / MTZ2 30H / MTZ3-40	NW32H / MTZ2 32H / MTZ2 30H / MTZ3-40	NW30H / MTZ2 30H / MTZ3-40				
Ir	2700	2400	3000	2700	3200 (at 480 V UV, 15% charging) OR 3000 (at 480 V UV, 10% charging)	3000	
tr	≥4	≥4	≥4	≥4	≥4	≥4	
li (x ln)	≤5	≤5	≤5	≤5	≤5	≤5	

Recommended Cable Sizes for UL

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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 600 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 in the I/O cabinet:

- 9 x 600 kcmil on input busbars
- 7 x 600 kcmil on output busbars
- 20 x 600 kcmil on DC+/DC- busbars
- 16 on N busbar
- · 24 on grounding 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⁽¹⁶⁾:

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

If the ambient temperature is greater than 30 °C (86 °F), select larger conductors 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, SIB, MBB disconnect devices. 100% rated circuit breakers for battery disconnect devices.

The output cables are sized based on the nominal current +10%. This is to accommodate either low grid voltage or deviation in length between parallel UPSs. The battery cables are sized based on end-of-discharge voltage which has been defined as 380 VDC.

Copper

UPS rating	1600 kW		1800 kW	
Voltage (V)	415	480	415	480
Input phases (AWG/kcmil)	9 x 400	8 x 400	9 x 500	8 x 500
Input EGC (AWG/ kcmil)	1 x 400	1 x 400	1 x 500	1 x 500
Output phases (AWG/kcmil)	7 x 400	6 x 400	7 x 500	6 x 500
Output EGC (AWG/ kcmil)	1 x 400	1 x 400	1 x 500	1 x 500

⁽¹⁶⁾ Using non-recommended cable sizes will affect the eConversion limits for parallel UPS systems.

Copper (Continued)

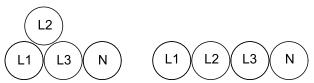
UPS rating	1600 kW		1800 kW	
Voltage (V)	415 480		415	480
DC+/DC- (AWG/ kcmil)	C- (AWG/ 8 x LIBSESMG17UL: 8 x LIBSESMG17UL: 9 x LIBSESMG17UL: 16 x 300 18 x 300 18 x 300			9 x LIBSESMG17UL: 18 x 300
	9 x LIBSESMG17UL: 18 x 300	9 x LIBSESMG17UL: 18 x 300	10 x LIBSESMG17UL: 20 x 300	10 x LIBSESMG17UL: 20 x 300
	10 x LIBSESMG17UL: 20 x 300	10 x LIBSESMG17UL: 20 x 300		
DC EGC (AWG/ kcmil)	2 x 300	2 x 300	2 x 300	2 x 300

Copper

UPS rating	2000 kW		
Voltage (V)	415	480	
Input phases (AWG/kcmil)	9 x 600	8 x 600	
Input EGC (AWG/ kcmil)	1 x 600	1 x 600	
Output phases (AWG/kcmil)	7 x 600	6 x 600	
Output EGC (AWG/ kcmil)	1 x 600	1 x 600	
DC+/DC- (AWG/ kcmil)	10 x LIBSESMG17UL: 20 x 300	10 x LIBSESMG17UL: 20 x 300	
DC EGC (AWG/ kcmil)	2 x 300	2 x 300	

Guidance for Organizing Input and Output Cables

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



eConversion Limits for Parallel UPS Systems

eConversion requires a minimum load percentage on the Galaxy VL 1600-2000 kW UPS system. The minimum required load percentages depend on the power cable sizes.

Standard eConversion Limits Based on Recommended Cable Sizes

UPS rating	Minimum load %
1600 kW	10%
1800 kW	10%
2000 kW	10%

Load Sharing in Balance and Unbalance Scenarios in Bypass Operation or eConversion Mode

In double conversion (normal operation), the load sharing between the UPSs in the UPS system is equal as the inverter controls the output current and voltage. However, when the UPS system is commanded to transfer to eConversion (requested bypass), the load sharing is determined by the UPS system impedances (busbars, SCRs). This means that the entire power path from the common input point to the common output point influences the load distribution. This scenario is not unique to this specific UPS system and is applicable to any UPS system.

During eConversion mode or requested bypass operation, if any UPS in the UPS system experiences a load exceeding 100%, it will automatically transfer back to inverter mode as per the design. This ensures the protection and stability of the system.

NOTE: Unbalanced current may occur in bypass operation or in eConversion mode due to the varying impedances in the power path. It is essential to monitor and manage these conditions to maintain UPS system reliability and performance.

Recommended Bolt and Lug Sizes for UL

NOTICE

RISK OF EQUIPMENT DAMAGE

Use only UL approved compression cable lugs.

Failure to follow these instructions can result in equipment damage.

Copper

Cable size	Bolt size (input/ output/neutral/ ground)	Bolt size (DC +/DC-)	Cable lug type (one hole)	Cable lug type (two hole NEMA)	Crimping tool	Die
250 kcmil	M12 x 45mm	M12 x 55mm	LCB250-12-X	LCC250-12-X	CT-930	CD-920-250 Yellow P62
300 kcmil	M12 x 45mm	M12 x 55mm	LCB300-12-X	LCC300-12-X	CT-930	CD-920-300 Red P66
350 kcmil	M12 x 45mm	M12 x 55mm	LCB350-12-X	LCC350-12-X	CT-930	CD-920-350 Red P71
400 kcmil	M12 x 45mm	M12 x 55mm	LCB400-12-X	LCC400-12-6	CT-930	CD-920-400 Blue P76
450 kcmil	M12 x 45mm	M12 x 55mm	1	LCC450-12-6	CT-930	1
500 kcmil	M12 x 45mm	M12 x 55mm	LCB500-12-X	LCC500-12-6	CT-930	CD-920-500 Blue P87
600 kcmil	M12 x 45mm	M12 x 55mm	LCB600-12-X	LCC600-12-6	CT-930	CD-920-600 Blue P94

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 Circuit Breaker Requirements

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

Design Requirements for a Battery Circuit Breaker

Battery circuit 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 circuit 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 circuit breaker and connected to the UPS system. See Signal Connection for Battery Bank Breaker Status with 8 x LIBSESMG17UL Battery Cabinets, page 56 for details.
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 circuit breaker must match the (smallest) battery configuration, to make the circuit breaker trip in case of a short circuit, up to the end of its life time.

Guidance for Organizing Battery Cables

NOTE: For third 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 feet). 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 (<98 feet)	Not recommended	Acceptable	Recommended	Recommended
31-75 m (99-246 feet)	Not recommended	Not recommended	Acceptable	Recommended
76-150 m (247-492 feet)	Not recommended	Not recommended	Acceptable	Recommended
151-200 m (493-656 feet)	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 70% power.	-25 °C to 55 °C (-13 °F to 131 °F)
Relative humidity	5-95% 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): 0.975 Up to 2000 m (6600 feet): 0.950 Up to 2500 m (8300 feet): 0.925 Up to 3000 m (10000 feet): 0.900 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 for a 500 kW UPS cabinet	69.5 dB at 100% load for 415 V systems 68 dB at 100% load for 480 V systems	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

Compliance

Safety	UL 1778 5th edition
	CSA C22.2 NO. 107.3-14, 3rd Edition
EMC/EMI/RFI	Individual UPS cabinets tested for FCC Part 15 Subpart B, Class A
Performance	Individual UPS cabinets: Performance in accordance with: IEC 62040-3: 2021-04, 3rd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements.
	Output performance classification (according to IEC 62040-3, Clause 5.3.4): VFI-SS-11
Transportation	Individual UPS cabinet: IEC 60721-4-2 Level 2M2
Seismic	ICC-ES AC 156 (2018); OSHPD Pre-approved; Sds=1.28 g for z/h=1 and Sds=1.9 g for z/h=0; lp=1.5
Earthing system(17)	TN-S, TNC-S
Overvoltage	This UPS is OVCII compliant.
category	If the UPS is installed in an environment with an OVC rating higher than II, an SPD (surge protection device) must be installed upstream of the UPS to reduce the overvoltage category to OVCII.
Protective class	I
Pollution degree	2

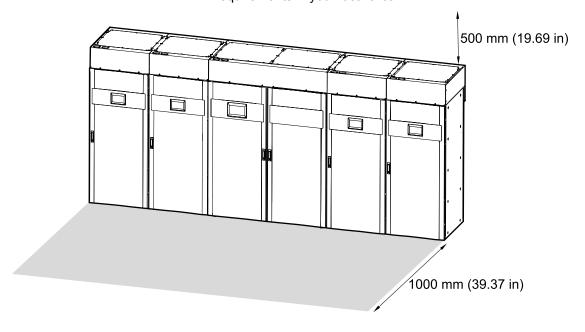
⁽¹⁷⁾ Corner grounding not permitted.

UPS System Weights and Dimensions

UPS system rating	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
1600 kW	4865 (10725)	2270 (89.4)	5096 (200.6)	1050 (41.3)
1800 kW	5017 (11060)			
2000 kW	5169 (11395)			

Clearance

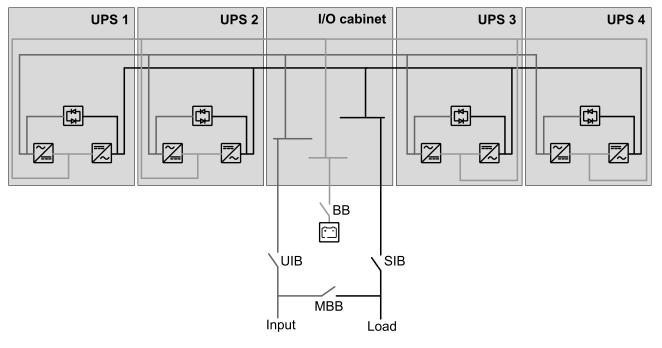
NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.



System Overview

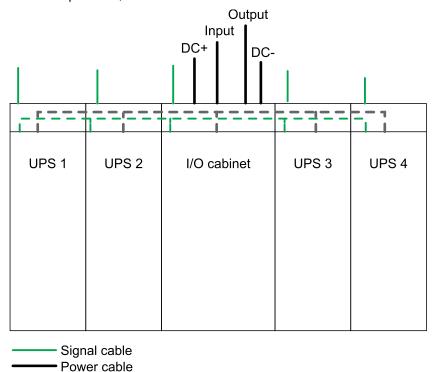
UIB	Unit input disconnect device
SIB	System isolation disconnect device
MBB	Maintenance bypass disconnect device
ВВ	Battery disconnect device

NOTE: In Schneider Electric literature, 'disconnect device' is used as a generic term covering circuit breakers or switches as their position may vary depending on configuration. Details about the individual configuration are found in the electrical diagram and/or by reading the symbol on the front of each disconnect device.



Installation Procedure

TIP: The cabinets are very tall. Use appropriate equipment to get adequate working access to the top of the cabinets like mobile ladders with platforms, raised podiums, or similar.



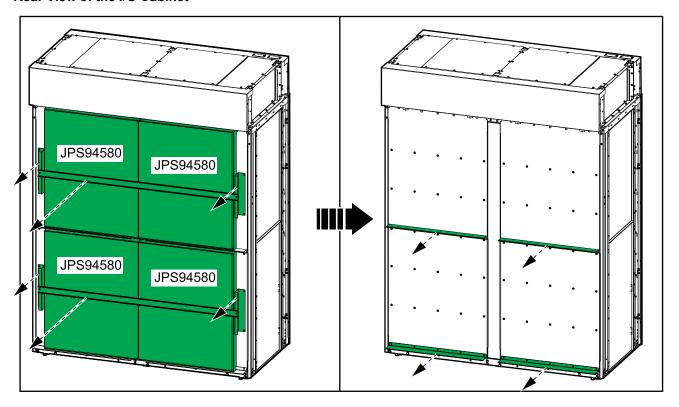
- 1. Prepare the Cabinets for Installation, page 32.
- 2. Install the Seismic Anchoring and Position the Cabinets, page 37.
- 3. Interconnect the Cabinets, page 40.
- 4. Connect the Power Cables in the I/O Cabinet, page 42.
- 5. For UPS 1-4: Install the ERMS Door Switch Kit GVLOPT011, page 44.
- 6. Connect the Internal Signal Cables Between the UPSs and the I/O Cabinet, page 45.
- 7. For UPS 1-4: Connect the Signal Cables, page 49.
- 8. **For UPS 1-4**: Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 52.
- 9. For UPS 1-4: Connect the External Communication Cables, page 62.
- 10. For UPS 1-4: Connect the Modbus Cables, page 63.
- 11. For UPS 1-4: Install the Power Module(s), page 65.
- 12. Final installation, page 67.

For moving or decommissioning the UPS system after installation has been completed, please see Decommission or Move the UPS System to a New Location, page 69.

Prepare the Cabinets for Installation

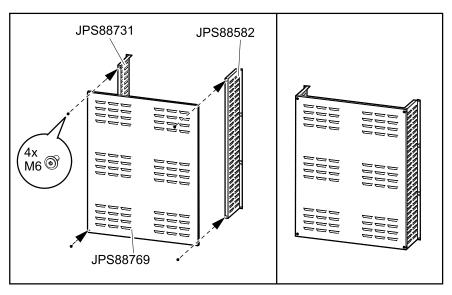
- 1. Remove the front doors of the I/O cabinet.
- Remove the I/O rear cover installation kits (4 x JPS94580) from the rear of the I/O cabinet:
 - Remove and discard the metal supports and brackets. Save the screws for reuse.
 - b. Lift down the installation kits (4 x JPS94580). Note that each rear I/O cover installation kit weighs approximately 17 kg (38 lbs).
 - c. Remove and discard the brackets from the rear of the I/O cabinet. Save the screws for reuse.

Rear View of the I/O Cabinet



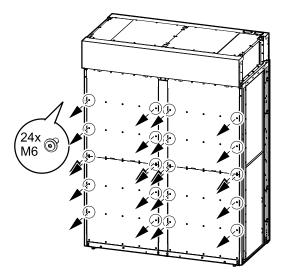
- 3. Install the rear covers on the I/O cabinet:
 - a. Open the rear I/O cover installation kits (4 x JPS94580) and disassemble the parts. Each kits contains two side plates (1 x JPS88731 and 1 x JPS88582), a rear plate (1 x JPS88769) and four M6 screws.
 - b. Mount the rear plate (JPS88769) on the two side plates (1 x JPS88731 and 1 x JPS88582) as shown using the four M6 screws. Note that the opening in the plates must face upwards.

Rear View



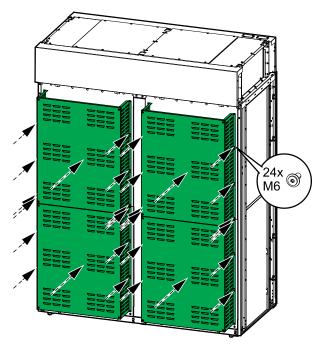
 Remove 24 M6 screws from the rear of the I/O cabinet as shown. Save for reuse.

Rear View of the I/O Cabinet



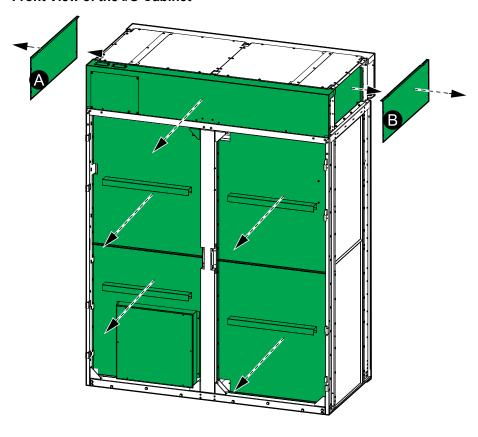
d. Install the four rear cover assemblies on the rear of the I/O cabinet with the 24 reused M6 screws. Note that the opening in the plates must face upwards.

Rear View of the I/O Cabinet



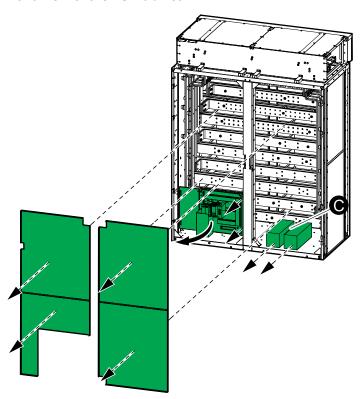
- 4. Remove the top side covers (marked (A) and (B) in the illustration) from the I/O cabinet. The top side covers will be installed on UPS 1 and UPS 4.
- 5. Remove the front plates, the top side plates, and the top front cover from the I/ O cabinet.

Front View of the I/O Cabinet



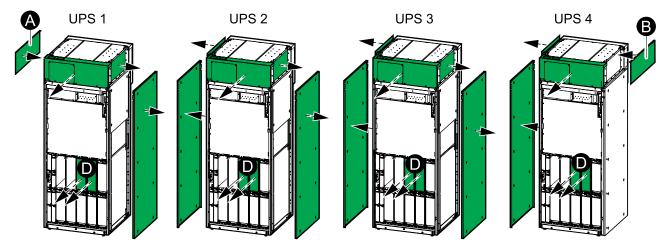
6. Remove the inner front lexan plates from the I/O cabinet. Remove the two screws in the inner front door and open the inner front door. Remove the two installation kits TME67411 and TME71599 (marked (C) in the illustration) from the right side of the I/O cabinet. Save the installation kits, they contain parts that will be used later in the installation.

Front View of the I/O Cabinet



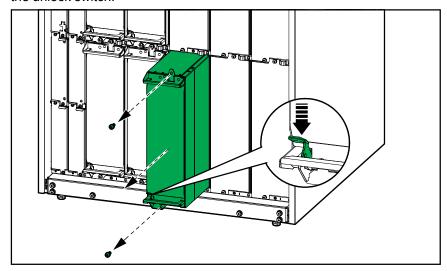
7. Open the front door of the UPSs. Remove the installation kits TME71597 and TME71598 (marked (D) in the illustration). Save the installation kits TME71597 and TME71598, they contain parts that must be installed by Schneider Electric Services during start-up. These installation kits do not contain parts needed during installation.

Front View of the UPS 1-4

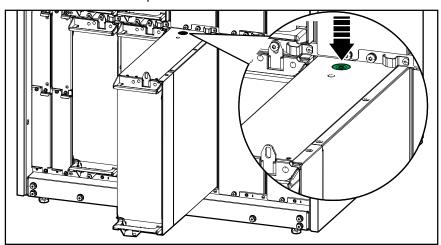


- 8. On UPS 1: Remove the top front cover and the right top side plate. Install the left top side cover (marked (A) in the illustration) that was removed from the I/O cabinet earlier.
- 9. On UPS 2 and UPS 3: Remove the side panels, the top side plates and the top front cover from the UPSs.

- 10. On UPS 4: Remove the top front cover and the left top side plate. Install the right top side cover (marked (B) in the illustration) that was removed from the I/O cabinet earlier.
- 11. **Optional**: You can remove some of the preinstalled power modules from UPS 1-4 to reduce the weight of the UPS cabinet and make it easier to move the UPS cabinet into final position. Follow the steps below:
 - 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.



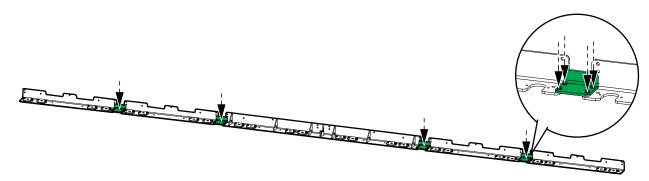
d. Store the power modules safely until reinstallation.

Install the Seismic Anchoring and Position the Cabinets

Reuse the transportation brackets that were on the cabinets when they were on the pallets. Parts and hardware are provided in installation kits TME71599 and TME67411 delivered in the I/O cabinet.

1. Interconnect the four rear anchoring brackets from the UPSs and the rear anchoring bracket from the I/O cabinet with the provided interconnection plates and fours screws each as shown.

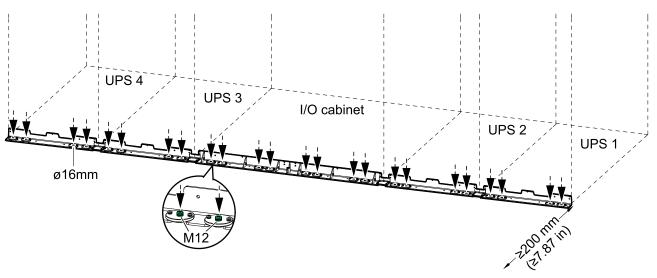
Rear View



2. Mount the rear anchoring assembly to the floor in the final installation position. 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.

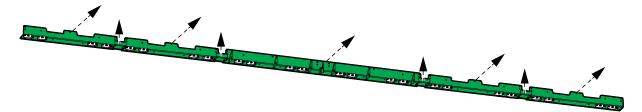
NOTE: The cabinets of the UPS system extend farther than the rear anchoring assembly, so there must be a \geq 200 mm (\geq 7.87 in) rear clearance from the rear anchoring assembly to anything behind the UPS system.

Rear View



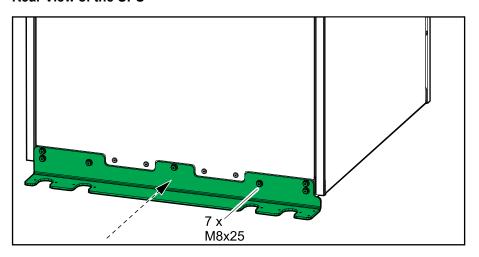
3. Remove all the screws, the interconnection plates, and the rear anchoring brackets.

Rear View

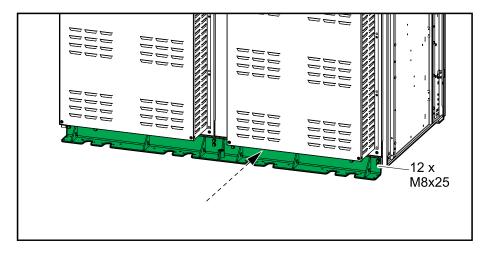


4. Install the rear anchoring brackets on the UPSs and the I/O cabinet with the provided M8x25 bolts.

Rear View of the UPS

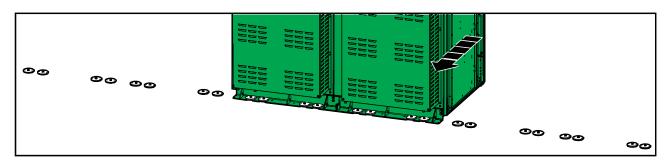


Rear View of the I/O Cabinet



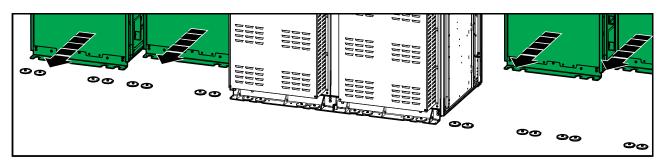
5. Push the I/O cabinet into final position and align with the rear seismic anchoring.

Rear View



6. Push the UPS 1-4 into final position and align with the rear seismic anchoring.

Rear View



Interconnect the Cabinets

1. Lower the front leveling feet of the cabinets with a wrench until they connect with the floor. Use a bubble-leveler to check that the cabinets are level.

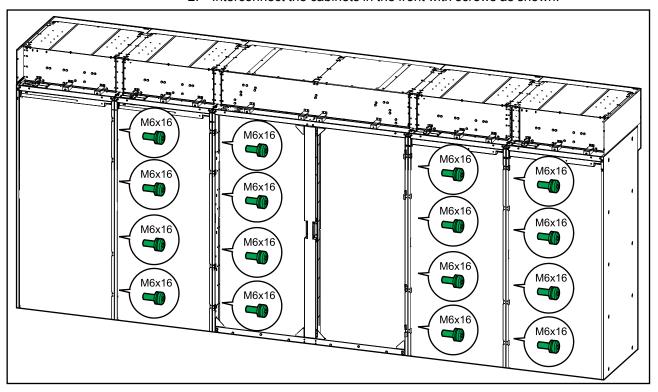
NOTICE

RISK OF EQUIPMENT DAMAGE

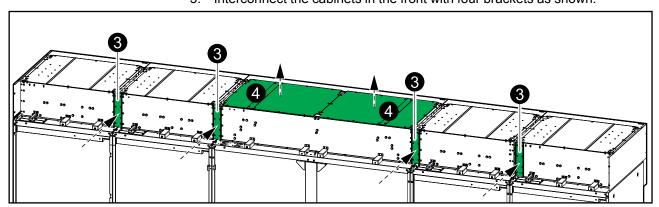
Do not move the cabinets after the leveling feet have been lowered.

Failure to follow these instructions can result in equipment damage.

2. Interconnect the cabinets in the front with screws as shown.



3. Interconnect the cabinets in the front with four brackets as shown.



4. Remove the top gland plates from the I/O cabinet.

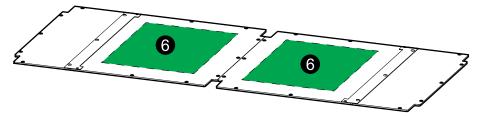
5. Drill/punch holes for power cables or conduits in the gland plates from the I/O cabinet. Install conduits (not provided), if applicable.

ADANGER

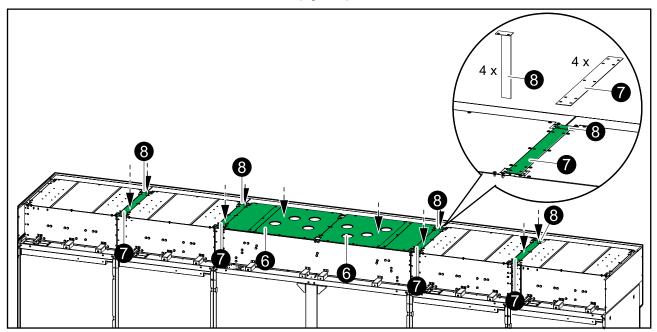
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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.



6. Reinstall the top gland plates on the I/O cabinet.



- 7. Interconnect the cabinets in the top with the four provided brackets and the provided M6x16 flat screws (803-9562).
- 8. Interconnect the cabinets in the top rear with the four provided brackets and the existing M6x16 flat screws (803-9562).

Connect the Power Cables in the I/O Cabinet

Hardware is provided in installation kit TME67411 for this procedure.

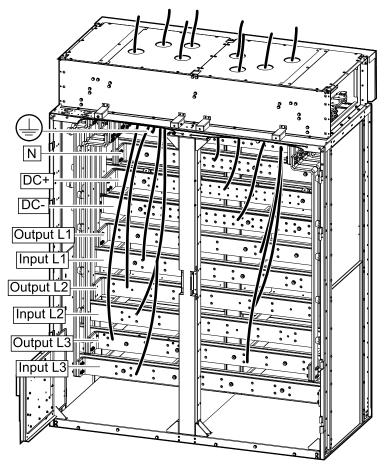
AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

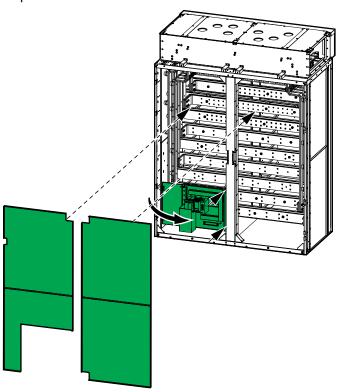
- Only use the provided bolts to connect the power cables to the busbars in the I/O cabinet.
- · Use the correct bolt size and length as described.

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

- 1. Route the power cables through the top of the I/O cabinet.
- 2. Connect the EGC cable to the ground busbar. Use the provided M12x45mm bolts.
- 3. Connect the neutral cables to the N busbar. Use the provided M12x45mm bolts.
- Connect the DC cables to the DC busbars (DC+, DC-). Use the provided M12x55mm bolts.
- Connect the input cables to the input busbars (L1, L2, L3). Use the provided M12x45mm bolts.
- Connect the output cables to the output busbars (L1, L2, L3). Use the provided M12x45mm bolts.



7. Close the inner door and fasten with the two screws. Reinstall the inner front lexan plates.

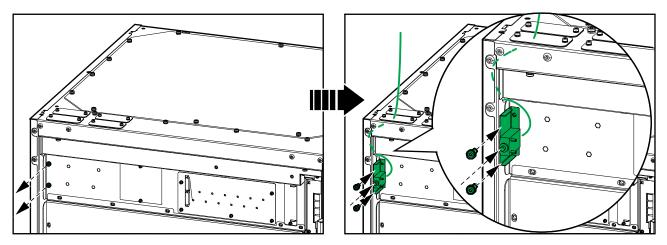


Install the ERMS Door Switch Kit GVLOPT011

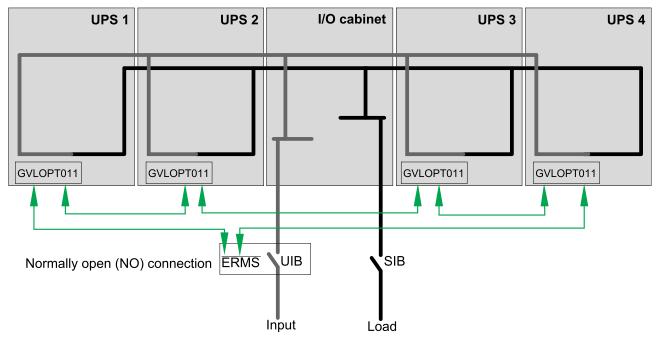
The ERMS (Energy Reduction Maintenance Settings) door switch kit GVLOPT011 must be installed in UPS 1, UPS 2, UPS 3, and UPS 4, and connected to disconnect device UIB.

- Remove the two screws from the UPSs.
- 2. Install the ERMS door switch with the two screws in each UPS.

Front View of the UPS (Top Box not Shown)



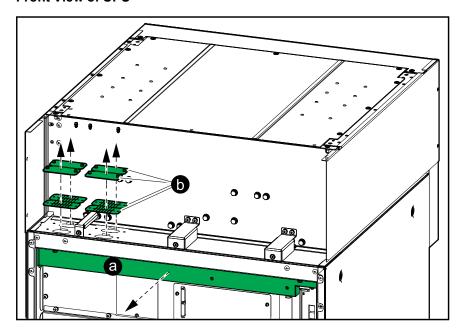
- 3. Route the signal cables from the ERMS door switch up and out through the top of the UPSs.
- 4. Connect the signal cables from the ERMS door switch in UPS 1, UPS 2, UPS 3, and UPS 4 to the disconnect device UIB in a normally open (NO) daisy-chain. Follow the documentation provided with the ERMS door switch for connection details. When the door of the UPS is open, ERMS must be activated/ON.



Connect the Internal Signal Cables Between the UPSs and the I/O Cabinet

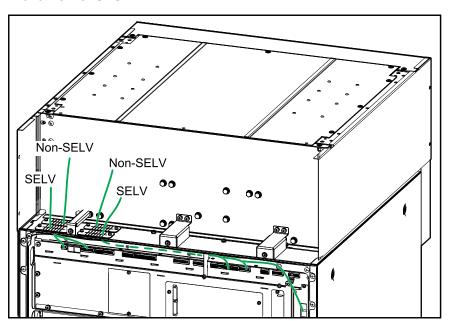
- 1. On UPS 1-4: Prepare for signal cables:
 - a. Remove the cover in front of the signal connections. Save for final installation steps.
 - b. Remove the gland plates and brush plates from the top of the UPS.

Front View of UPS

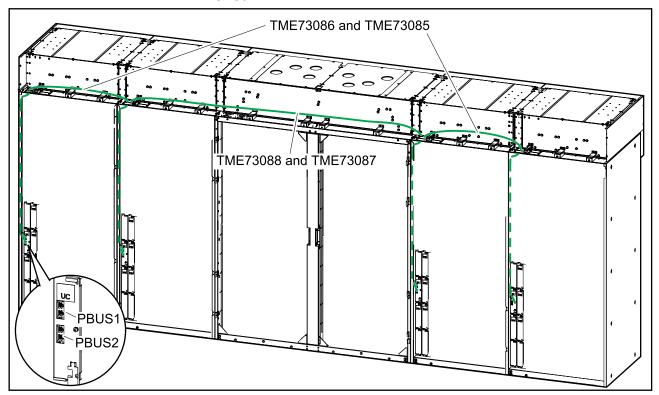


c. Reinstall the brush plates.

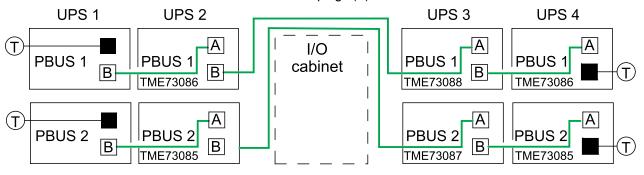
Front View of UPS



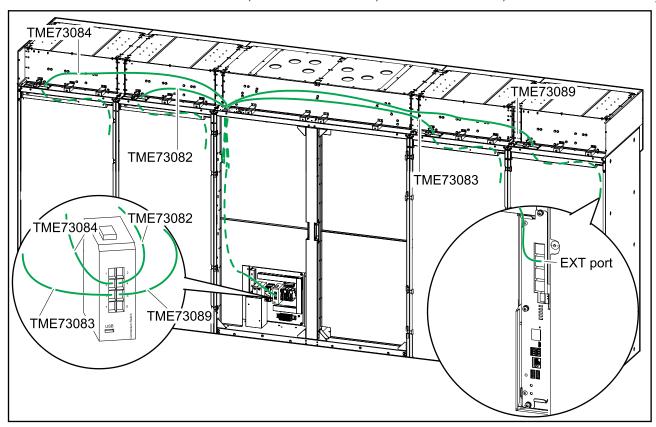
2. Connect the provided PBUS 1 cables (2 x TME73086 and 1 x TME73088) and PBUS 2 cables (2 x TME73085 and 1x TME73087) to the PBUS ports on the UPSs.



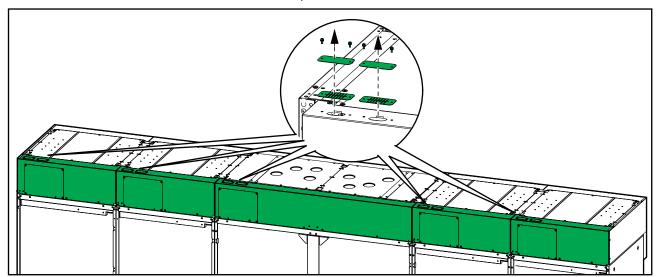
3. Mount termination plugs (T) in the unused connectors.



4. Connect the provided RJ45 cables to the EXT port in each UPS (TME73084 in UPS1, TME73082 in UPS 2, TME73083 in UPS 3, and TME73089 in UPS 4).



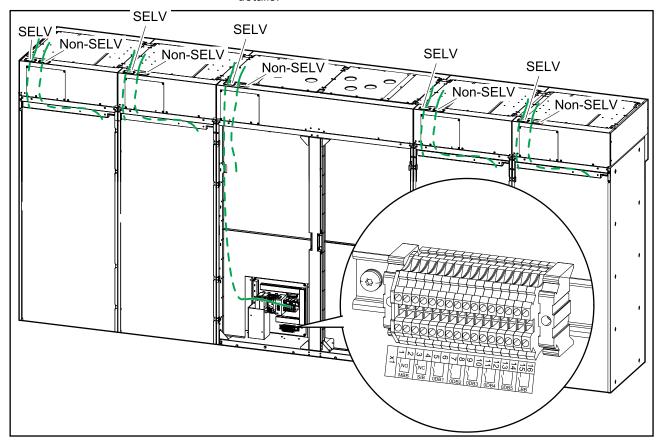
- 5. Route the RJ45 cables from each UPS into the I/O cabinet and to the centralized UPS system display interface.
- 6. Connect the RJ45 cables from the UPSs to the ConneXium switch port 3-6 in the I/O cabinet. TME73084 from UPS 1 to port 3, TME73082 from UPS 2 to port 4, TME73083 from UPS 3 to port 5, TME73089 from UPS 4 to port 6.
- 7. Reinstall the top front covers on the UPSs and the I/O cabinet.



- 8. Remove the gland plates and brush plates from the top front covers.
 - a. For installation without conduits: Reinstall the brush plates.
 - b. **For installation with conduits**: Drill holes in the gland plates for conduits, install conduits, and reinstall the gland plates.

 Route the signal cables from the external disconnect devices SIB and MBB into the I/O cabinet to the centralized UPS system display interface. Connect the signal cables from the external disconnect devices to the communication terminal block.

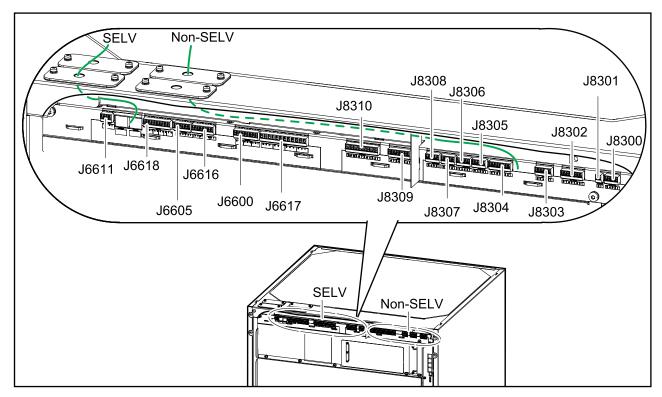
NOTE: The signal cables from the external disconnect devices SIB and MBB are connected to the centralized UPS system display interface in the I/O cabinet for overview purposes only. The signal cables from the external disconnect devices SIB and MBB must also be connected directly to each UPS for operation and control purposes. See Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 52 for details.



- 10. **Optional**: Route the signal cables from the optional external disconnect devices in the switchgear (output distribution disconnect devices (ODB1, ODB2, ODB3, ODB4, ODB5) and load bank disconnect device (LBB) if present) into the I/O cabinet to the centralized UPS system display interface. Connect the signal cables from the external disconnect devices to the communication terminal block.
- 11. Route the signal cables through the top boxes and into the cabinets. Route the SELV cables separately from the non-SELV cables.

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.

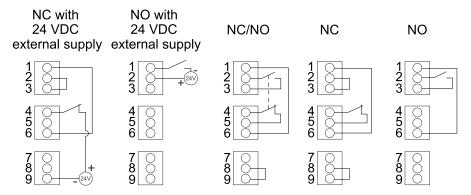
All Class 2/SELV signal cables shall be double insulated/jacket cable and minimum rated for 30 VDC. All non-Class 2/non-SELV signal cables shall be double insulated/jacket cable and minimum rated for 600 VAC.

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.

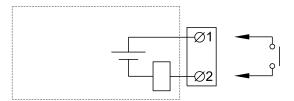
NOTE: The default setting for the EPO activation is to turn off the inverter.

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

Connect the Class 2/SELV signal cables to the input contacts and output relays in the UPS.

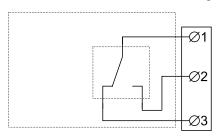
Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.

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.



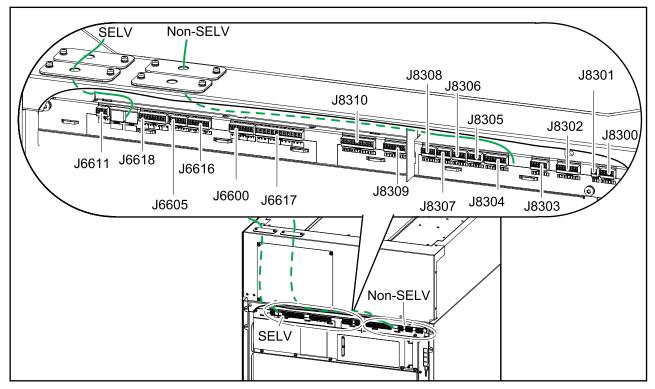
Name	Description	Location	
OUT _1 (output relay 1)	Configurable output relay	Terminal J6617, 1-3	

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

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

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.

 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 unless otherwise instructed in the documentation for your battery solution.

AWARNING

HAZARD OF FIRE

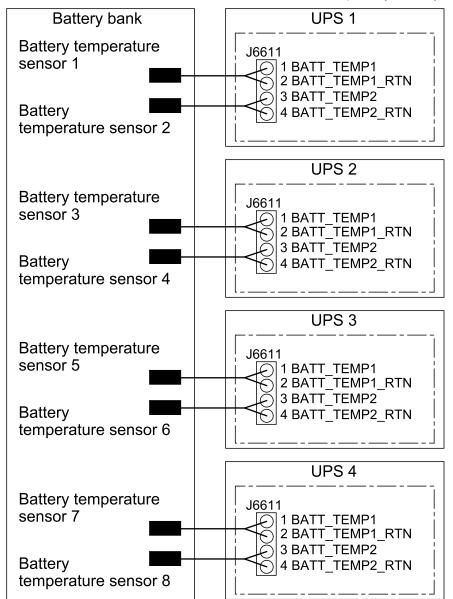
Position the temperature sensor as described to ensure correct temperature measurements.

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 UPSs and connect as shown.

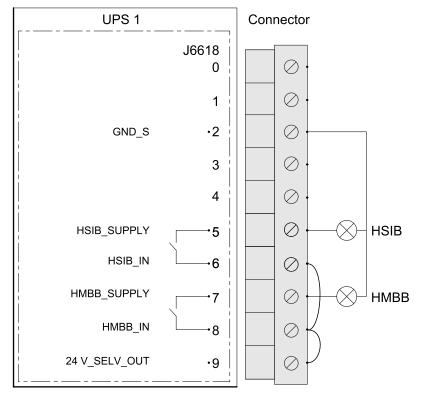
NOTE: Two temperature sensors are provided with each UPS.

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

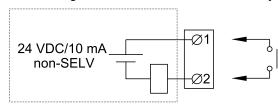


3. Connect signal cables from the disconnect device indicator lights in your switchgear to terminal J6618 in the top of UPS 1. If an external supply is used, remove jumper from J6618 pin 8 and 9 in UPS 1.

NOTE: The disconnect device 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 disconnect device indicator light terminals unless it can be confirmed that the circuit is Class 2/SELV.

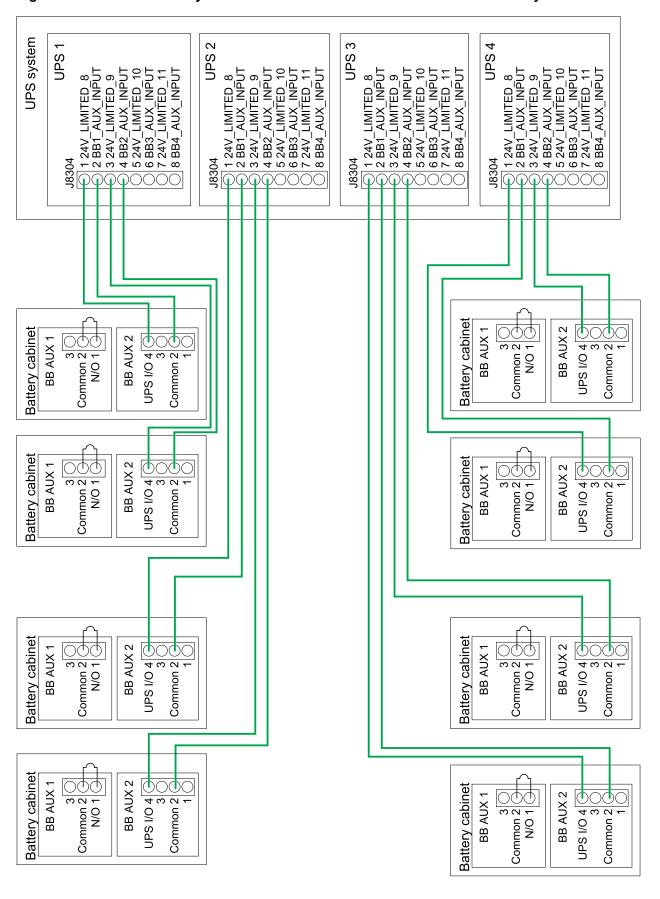


4. Connect signal cables from AUX switches in your switchgear to the UPS.

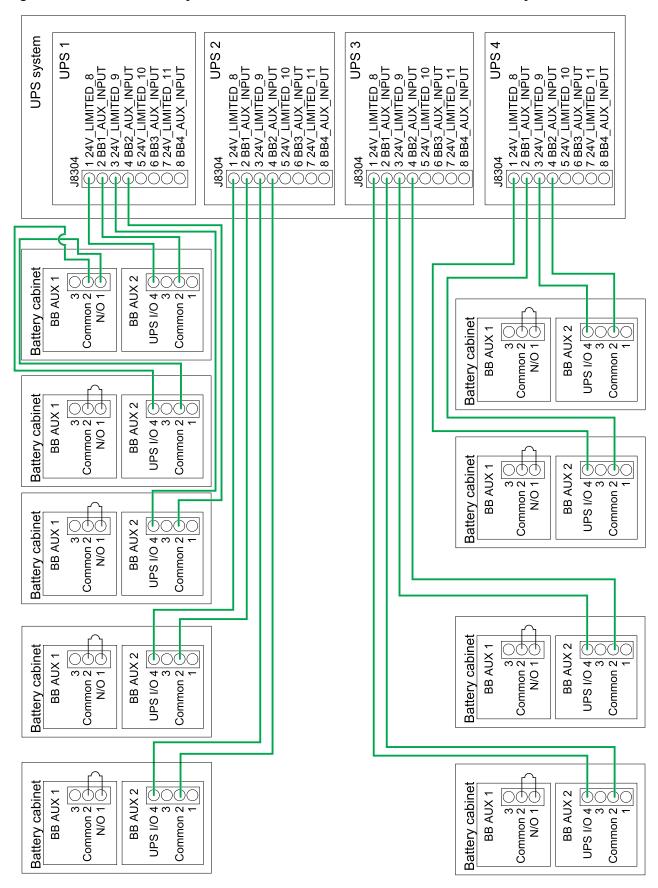


Terminal number	Function	Connection	
J8304, 1-2	BB1 (battery disconnect device 1)	See Signal Connection for Battery Bank Breaker Status with 8 x LIBSESMG17UL Battery Cabinets, page 56, Signal Connection for Battery Bank Breaker Status	
J8304, 3-4	BB2 (battery disconnect device 2)	with 9 x LIBSESMG17UL Battery Cabinets, page 57, or Signal Connection for Battery Bank Breaker Status with 10x LIBSESMG17UL Battery Cabinets, page 58.	
J8302, 1-2	UIB (unit input disconnect device)	See Signal Connection for UIB Status, page 59.	
J8303, 5-6	SIB (system isolation disconnect device)	See Signal Connection for SIB status, page 60.	
J8302, 5-6	MBB (maintenance bypass disconnect device)	See Signal Connection for MBB Status, page 61.	

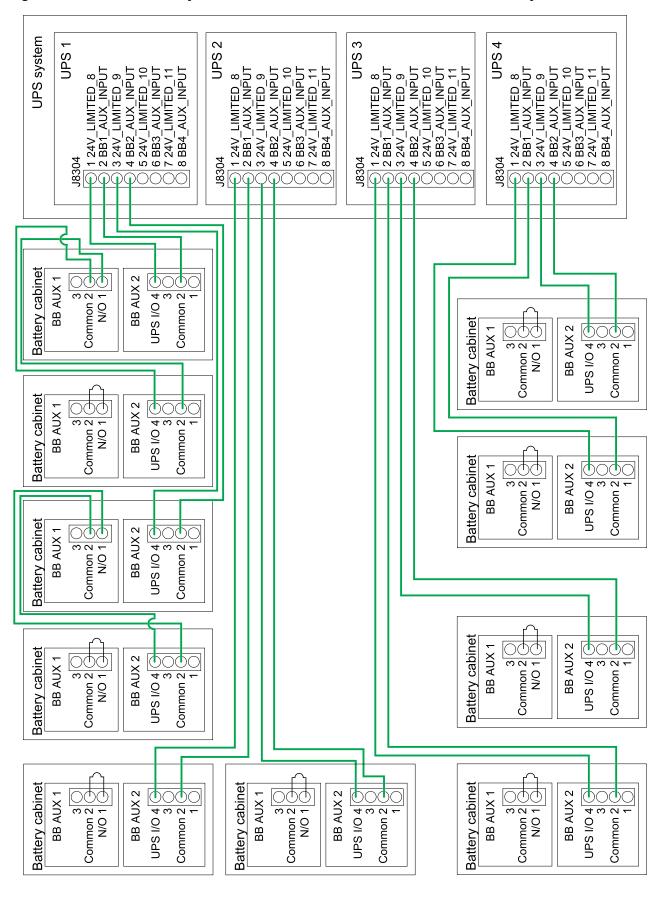
Signal Connection for Battery Bank Breaker Status with 8 x LIBSESMG17UL Battery Cabinets



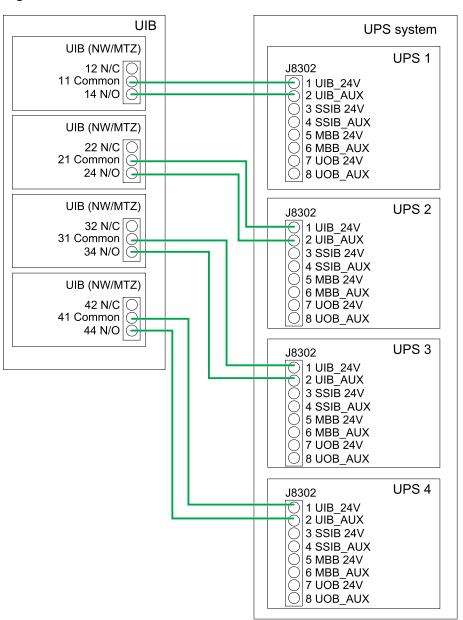
Signal Connection for Battery Bank Breaker Status with 9 x LIBSESMG17UL Battery Cabinets



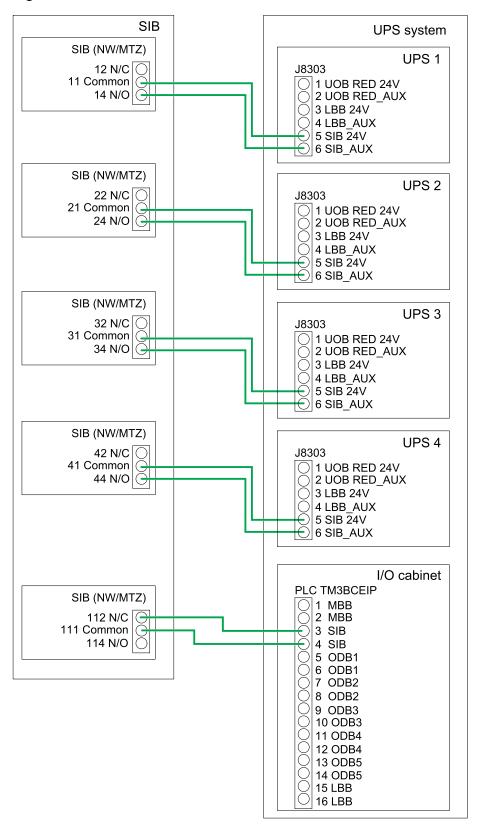
Signal Connection for Battery Bank Breaker Status with 10x LIBSESMG17UL Battery Cabinets



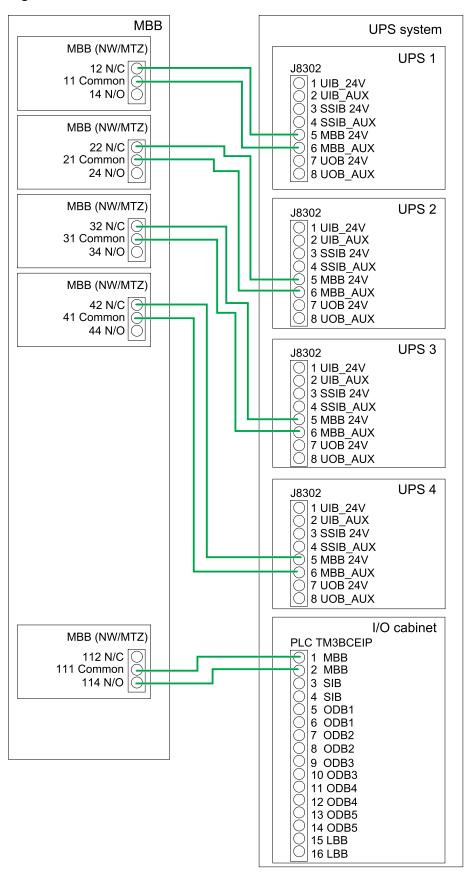
Signal Connection for UIB Status



Signal Connection for SIB status

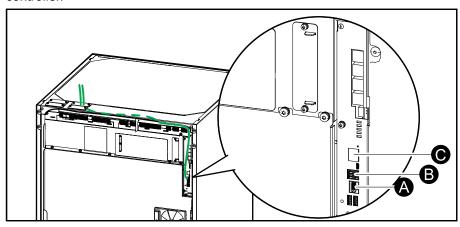


Signal Connection for MBB Status



Connect the External Communication Cables

 Connect the external communication cables to the ports in the system level controller.

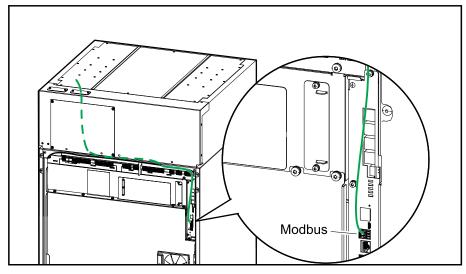


- A. Universal I/O port for built-in network management card.
- B. Modbus port for built-in network management card.
- C. Network port for built-in network management card. Use a shielded network cable.

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

Connect the Modbus Cables

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

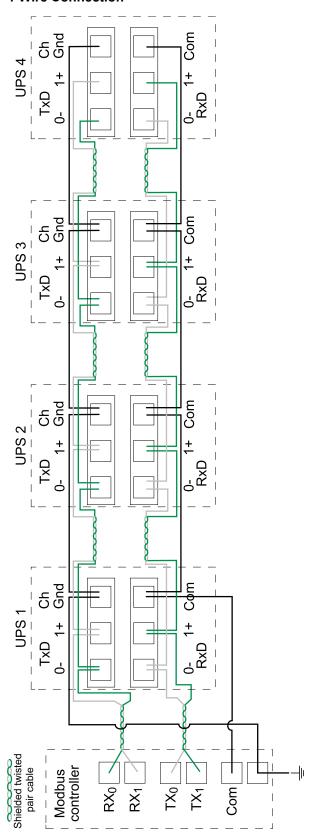


- All Modbus signal cables shall be double insulated/jacket cable and minimum rated for 30 VDC.
- Shielded twisted pair cables must be used for Modbus connections. The shield connection to the ground must be as short as possible (ideally below 1 cm). The cable shield must be connected to the Ch Gnd pin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

2-Wire Connection

Com Sh Gnd UPS 4 Shd Gnd Com UPS 3 6 g G Com Ch Gnd UPS 1 Shielded twisted pair cable Modbus controller Com ۵ 7

4-Wire Connection



 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 19200 baud should not require termination resistors.

Install the Power Module(s)

The UPS arrives with a number of preinstalled power modules. Additional power modules are shipped separately and must be installed in UPS 1-4 to reach the correct UPS system kW rating.

ACAUTION

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.

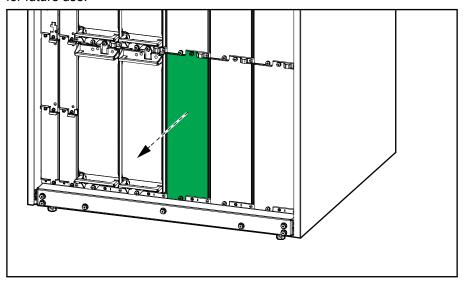
NOTICE

RISK OF UNEXPECTED EQUIPMENT BEHAVIOR

UPS 1-4 must have the same number of power modules installed.

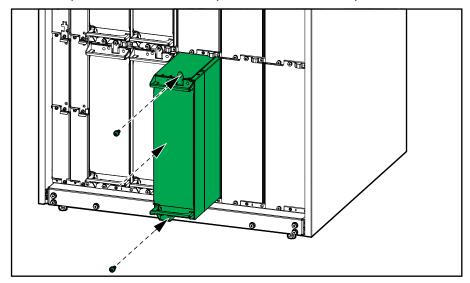
Failure to follow these instructions can result in equipment damage.

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

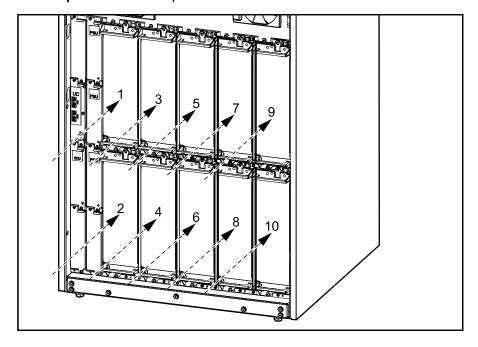


2. Push the power module into the slot. The enable mechanism will latch when the power module is correctly inserted.

3. Install the provided screws in the top and the bottom of the power module.



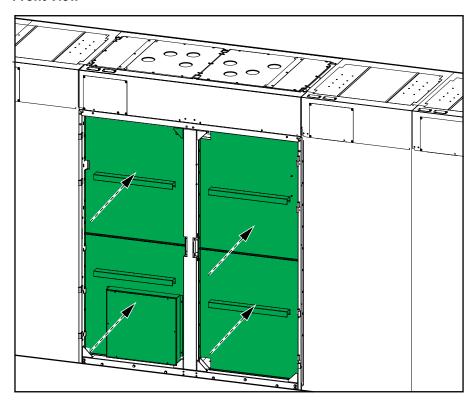
Post-requisite: Install the power modules in the shown order from 1-10.



Final installation

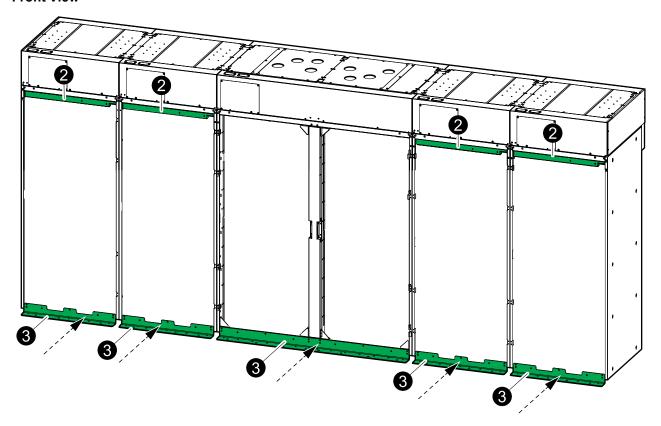
1. Reinstall the front plates on the I/O cabinet.

Front View



2. Reinstall the cover over the signal connections on UPS 1-4.

Front View



3. Install the front transportation brackets on the UPSs – the front transportation brackets were removed during unpacking. Reinstall the front anchoring bracket on the I/O cabinet, if it has been removed during unpacking.

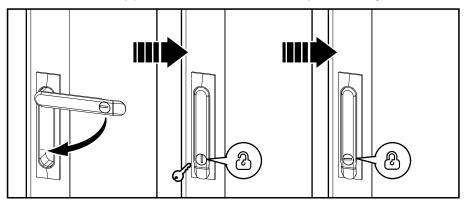
NOTICE

RISK OF EQUIPMENT DAMAGE

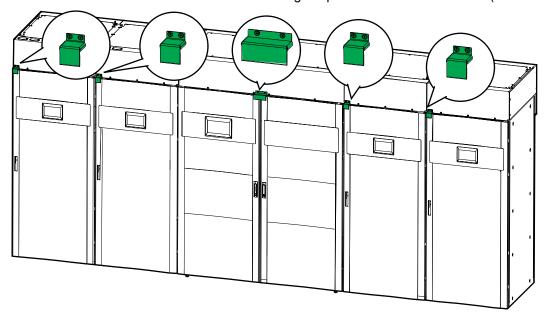
Install the front transportation brackets to avoid the UPS and I/O cabinet overheating from circulating hot air from the rear outlets. The front transportation brackets block the hot air backflow.

Failure to follow these instructions can result in equipment damage.

- 4. **Only for seismic anchoring**: Mount the front anchoring brackets on all the cabinets to the floor.
- 5. Close the front door(s) and lock the handle with the provided key.



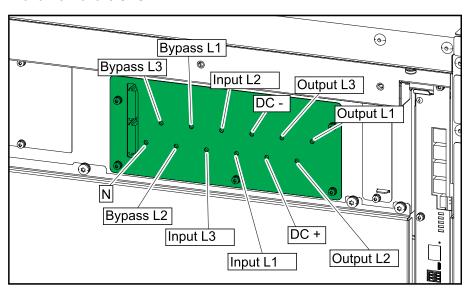
6. **Only for seismic anchoring**: Install the provided seismic top brackets on the cabinets using the provided M6x16 flat screws (803-9562).



Decommission or Move the UPS System to a New Location

- Shut down the UPS system completely follow the instructions in the UPS system operation manual.
- Lockout/Tagout all disconnect devices in the switchgear in the OFF (open) position.
- 3. Lockout/Tagout all battery disconnect devices in the switchgear/battery solution in the OFF (open) position.
- Remove the seismic door brackets (if present) and open the front door of the UPSs and the I/O cabinet.
- 5. On UPS 1-4: If present, Lockout/Tagout the backfeed disconnect device BF2 in the OFF (open) position.
- On UPS 1-4: Measure for and verify ABSENCE of voltage with a multimeter probe through the holes in the transparent plate for input, output, neutral, and DC.

Front View of the UPS



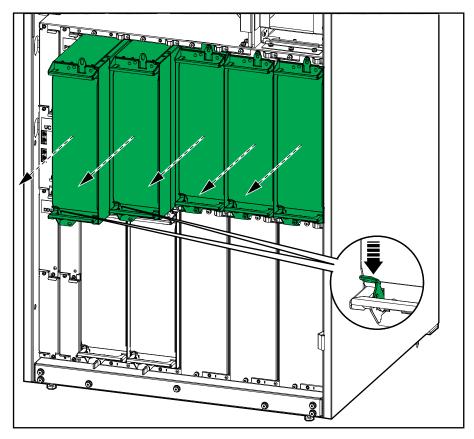
7. Remove all power modules from the UPSs:

ACAUTION

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.



- 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.
- d. Install a filler plate (if available) in front of the empty power module slot.
- e. Store the power modules correctly until reinstallation.

AWARNING

RISK OF EQUIPMENT DAMAGE

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

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

8. Remove the inner front plates of the I/O cabinet to access the power cable connections. See Prepare the Cabinets for Installation, page 32 for details.

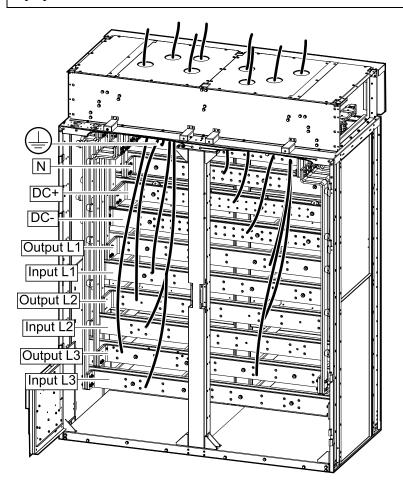
9. Measure for and verify ABSENCE of voltage on each input/output/neutral/DC busbar before continuing.

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Measure for and verify ABSENCE of voltage on each input/output/neutral/DC busbar before continuing.

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



- 10. Disconnect the power cables and remove them from the I/O cabinet. See Connect the Power Cables in the I/O Cabinet, page 42 for details.
- 11. Disconnect and remove any signal cables from the UPSs and the I/O cabinet. See Connect the Internal Signal Cables Between the UPSs and the I/O Cabinet, page 45, Install the ERMS Door Switch Kit GVLOPT011, page 44, Connect the Signal Cables, page 49, Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products, page 52, and Connect the Modbus Cables, page 63 for details.
- 12. Remove the interconnection brackets on the top and front of the cabinets, remove the interconnection screws, and remove the top covers. See Interconnect the Cabinets, page 40 for details. Save all parts and hardware for reinstallation.
- 13. Contact Schneider Electric for removal of the interconnection busbars between the cabinets. The interconnection busbars must only be removed or installed by Schneider Electric.
- 14. Remove the front transportation brackets from the cabinets. Save all parts and hardware for reinstallation.
- 15. Reinstall any removed plates and covers on the cabinets. See Final installation, page 67 for details.

- 16. Close and lock the front doors.
- 17. Raise the feet of the cabinets until the casters have full contact with the floor.
- 18. Pull the cabinets out one by one to disengage the rear anchoring brackets from the rear anchors.
- 19. Remove the rear anchoring brackets from the cabinets and remove the rear anchors from the floor. Save all parts and hardware for reinstallation.
- 20. Reinstall six power modules starting from the bottom row in each UPS to improve the balance of the UPS during transportation.

AWARNING

TOP-HEAVY CABINET

Install five power modules in the bottom row and one power module in the top row of the UPS to improve the balance of the UPS during transportation.

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

- 21. Close and lock the front door of the UPSs.
- 22. You can now move each cabinet by rolling it over the floor on the casters.

▲ WARNING

TIPPING HAZARD

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

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

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

AWARNING

TALL TOP-HEAVY CABINET

The cabinets are tall and heavy. Take appropriate precautions during handling and preparation for transport/shipment.

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

AWARNING

TIPPING HAZARD

For transport over longer distances or in conditions that are not suitable for the casters of the cabinet, ensure:

- that personnel performing the transport have necessary skill and have received adequate training;
- to use appropriate tools to safely lift and transport the cabinet;
- to protect the product against damage by using appropriate protection (like wrapping or packaging).

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

Transportation requirements:

- Mount each UPS in a vertical position in the center of a suitable pallet with minimum pallet dimensions: 950 mm x 1100 mm (37.4 in x 43.3 in)). The pallet must be suitable for the weight of the UPS: 840 kg (1852 lbs).
- Mount the I/O cabinet in a vertical position in the center of a suitable pallet with minimum pallet dimensions: 1920 mm x 1020 mm (75.6 in x 40.2 in)).
 The pallet must be suitable for the weight of the I/O cabinet: 1209 kg (2665 lbs).
- Use appropriate means of fixation to mount the cabinet to the pallet.
- The original shipping pallet in combination with the original transportation brackets can be reused, if in undamaged condition. See the receiving and unpacking manual that came with the cabinet for details.

ADANGER

TIPPING HAZARD

- The cabinet must be appropriately fixed to the pallet immediately after being placed on the pallet.
- The fixation hardware must be strong enough to withstand vibrations and shocks during loading, transport, and unloading.

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

AWARNING

UNEXPECTED EQUIPMENT BEHAVIOR

Do not lift the cabinet with a forklift/pallet truck directly on the frame as it may bend or damage the frame.

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

- 24. Perform one of the following:
 - Decommission the UPS system, OR
 - Move the UPS system to a new location to install it.
- 25. Only for installing the UPS system in a new location: Follow the installation manual to install the UPS system in the new location. See Installation Procedure, page 31 for installation overview. Startup must only be performed by Schneider Electric.

AADANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Startup must only be performed by Schneider Electric.

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

Schneider Electric 35 rue Joseph Monier 92500 Rueil Malmaison France



As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication. $\frac{1}{2} \int_{-\infty}^{\infty} \frac{1}{2} \int_{-\infty}^{\infty} \frac{$

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