

Galaxy VS

UPS with Up to 4 Internal Battery Strings

Installation

10-50 kW 400 V

20-50 kW 480 V

10-25 kW 208 V

9/2019



Legal Information

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this guide are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owners.

This guide and its content are protected under applicable copyright laws and furnished for informational use only. No part of this guide may be reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), for any purpose, without the prior written permission of Schneider Electric.

Schneider Electric does not grant any right or license for commercial use of the guide or its content, except for a non-exclusive and personal license to consult it on an "as is" basis. Schneider Electric products and equipment should be installed, operated, serviced, and maintained only by qualified personnel.

As standards, specifications, and designs change from time to time, information contained in this guide may be subject to change without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this material or consequences arising out of or resulting from the use of the information contained herein.

IEC



UL



Go to

IEC: https://www.productinfo.schneider-electric.com/portals/ui/galaxyvs_iec/ or

UL: https://www.productinfo.schneider-electric.com/portals/ui/galaxyvs_ul/

or scan the QR code above for digital experience and translated manuals.

Table of Contents

Important Safety Instructions — SAVE THESE INSTRUCTIONS	5
FCC Statement	6
Electromagnetic Compatibility	6
Safety Precautions	6
Electrical Safety	9
Battery Safety	9
Specifications	11
Specifications for 400 V Systems	11
Input Specifications 400 V	11
Bypass Specifications 400 V	11
Output Specifications 400 V	12
Battery Specifications 400 V	13
Recommended Cable Sizes 400 V	14
Recommended Upstream Protection 400 V	15
Specifications for 480 V Systems	16
Input Specifications 480 V	16
Bypass Specifications 480 V	17
Output Specifications 480 V	17
Battery Specifications 480 V	18
Recommended Cable Sizes 480 V	19
Recommended Upstream Protection 480 V	20
Specifications for 208 V Systems	21
Input Specifications 208 V	21
Bypass Specifications 208 V	21
Output Specifications 208 V	22
Battery Specifications 208 V	23
Recommended Cable Sizes 208 V	24
Recommended Upstream Protection 208 V	25
Recommended Bolt and Lug Sizes	26
Torque Specifications	26
Environment	27
UPS Weights and Dimensions	27
Clearance	28
Single System Overview	29
Parallel System Overview	30
Overview of Installation Kits	33
Installation Procedure for Single System	34
Installation Procedure for Parallel Systems	35
Prepare for Installation	36
Install the Seismic Anchoring (Option)	40
Connect the Power Cables in Single Mains System	41
Connect the Power Cables in Dual Mains System	43
Connect the Power Cables from an Adjacent Modular Battery Cabinet	45

Connect the Signal Cables	47
Connect the Signal Cables from a Modular Battery Cabinet.....	49
Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products	50
Connect the IMB Signal Cables in a Simplified 1+1 Parallel System.....	52
Connect the PBUS Cables	54
Connect the External Communication Cables.....	55
Connect the Modbus Cables	56
Add Translated Safety Labels to Your Product.....	58
Final Installation	59

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 interference, in which case the user may be required to take additional measures.

Failure to follow these instructions can result in equipment damage.

Safety Precautions

⚡⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚡⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚡⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

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

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

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

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

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

 WARNING**HAZARD OF ARC FLASH**

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

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

NOTICE**RISK OF OVERHEATING**

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

Failure to follow these instructions can result in equipment damage.

NOTICE**RISK OF EQUIPMENT DAMAGE**

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

Failure to follow these instructions can result in equipment damage.

Electrical Safety

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the utility/mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that utility/mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- A disconnection device (e.g. disconnection circuit breaker or switch) must be installed to enable isolation of the system from upstream power sources in accordance with local regulations. This disconnection device must be easily accessible and visible.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

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.

NOTICE**RISK OF EQUIPMENT DAMAGE**

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

Specifications

Specifications for 400 V Systems

Input Specifications 400 V

UPS rating	10 kW	15 kW	20 kW	30 kW	40 kW	50 kW
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE (single mains) 3-wire (L1, L2, L3, PE) WYE (dual mains) ^{1 2}					
Input voltage range (V)	380 V: 331-437 400 V: 340-460 415 V: 353-477					
Frequency range (Hz)	40-70					
Nominal input current (A)	16/15/14	24/22/22	32/30/29	47/45/43	63/60/58	79/75/72
Maximum input current (A)	19/18/17	28/27/26	38/36/35	57/54/52	76/72/69	91/90/87
Input current limitation (A)	20/19/18	30/28/27	39/37/36	59/56/54	78/74/72	91/91/90
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%					
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)					
Maximum short circuit rating	65 kA RMS					
Protection	Built-in backfeed protection and fuses					
Ramp-in	Programmable and adaptive 1-40 seconds					

Bypass Specifications 400 V

UPS rating	10 kW	15 kW	20 kW	30 kW	40 kW	50 kW
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE) WYE					
Bypass voltage range (V)	380 V: 342-418 400 V: 360-440 415 V: 374-457					
Frequency range (Hz)	50/60 ± 1, 50/60 ± 3, 50/60 ± 10 (user selectable)					
Nominal bypass current (A)	15/15/14	23/22/21	31/29/28	46/44/42	61/58/56	77/73/70
Nominal neutral current (A)	26/25/24	39/37/36	53/50/48	79/75/72	105/100/96	131/125/120
Maximum short circuit rating ³	65 kA RMS					
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 200 A, prearcing 5.25 kA ² s					

1. TN and TT power distribution systems are supported. Corner (line) grounding is not supported.
2. **Only for dual mains system with upstream 4-pole breakers:** Install an N connection with the input cables (L1, L2, L3, N, PE).
3. Conditioned by the internal fuse rated 200 A, prearcing 5.25 kA²s.

Output Specifications 400 V

UPS rating	10 kW	15 kW	20 kW	30 kW	40 kW	50 kW
Voltage (V)	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415	380/400/415
Connections	4-wire (L1, L2, L3, N, PE)					
Voltage regulation	Symmetrical load $\pm 1\%$ Asymmetrical load $\pm 3\%$					
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 110% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)					
Dynamic load response	$\pm 5\%$ after 2 milliseconds $\pm 1\%$ after 50 milliseconds					
Output power factor	1					
Nominal output current (A)	15/14/14	23/22/21	30/29/28	46/43/42	61/58/56	76/72/70
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz $\pm 0.1\%$ free-running					
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6					
Total harmonic distortion (THDU)	<1% for linear load ≤ 20 kW: <3% for non-linear load >20 kW: <5% for non-linear load					
Output performance classification (according to IEC/ EN62040-3)	VFI-SS-111					
Load crest factor	2.5					
Load power factor	From 0.7 leading to 0.7 lagging without any derating					

Battery Specifications 400 V

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

All values are based on 40 battery blocks.

UPS rating	10 kW	15 kW	20 kW	30 kW	40 kW	50 kW
Charging power in % of output power at 0-40% load	80%					
Charging power in % of output power at 100% load	20%					
Maximum charging power (at 0-40% load) (kW)	8	12	16	24	32	40
Maximum charging power (at 100% load) (kW)	2	3	4	6	8	10
Nominal battery voltage (VDC)	480					
Nominal float voltage (VDC)	545					
Maximum boost voltage (VDC)	571					
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C					
End of discharge voltage (full load) (VDC)	384					
Battery current at full load and nominal battery voltage (A)	22	33	43	65	87	109
Battery current at full load and minimum battery voltage (A)	27	41	54	81	109	136
Ripple current	< 5% C20 (5 minute runtime)					
Battery test	Manual/automatic (selectable)					
Maximum short circuit rating	10 kA					

Recommended Cable Sizes 400 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All wiring must comply with all applicable national and/or electrical codes. The maximum allowable cable size is 50 mm².

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

The maximum number of cable connections per busbar: 2 on input/output/bypass busbars; 2 on DC+/DC- busbars; 4 on N busbar; 5 on PE busbar.

NOTE: Overcurrent protection is to be provided by others.

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

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

PE cable size is based on table 54.2 of IEC 60364-4-54.

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

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

Copper	10 kW	15 kW	20 kW	30 kW	40 kW	50 kW
Input phases (mm ²)	6	6	10	16	25	35
Input PE (mm ²)	6	6	10	16	16	16
Bypass/output phases (mm ²)	6	6	10	16	25	25
Bypass PE/output PE (mm ²)	6	6	10	16	16	16
Neutral ⁴ (mm ²)	6	10	16	25	35	50
DC+/DC- ⁵ (mm ²)	6	10	16	25	35	50
DC PE (mm ²)	6	10	16	16	16	25

4. Neutral conductor is sized to handle 1.73 times phase current in case of high harmonic content from non-linear loads. If non or less harmonic currents are expected, neutral conductor can be sized accordingly but not less than the phase conductor.
5. Values are based on 40 battery blocks.

Recommended Upstream Protection 400 V

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.

UPS rating	10 kW		15 kW		20 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	NSX100H TM25D (LV429676)	NSX100H TM16D (LV429677)	NSX100H TM32D (LV429675)	NSX100H TM25D (LV429676)	NSX100H TM40D (LV429674)	NSX100H TM32D (LV429675)
In (A)	25	16	32	25	40	32
Ir (A)	20	16	32	23	40	32
Im (A)	300 (fixed)	190 (fixed)	400 (fixed)	300 (fixed)	500 (fixed)	400 (fixed)

UPS rating	30 kW		40 kW		50 kW	
	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	NSX100H TM63D (LV429672)	NSX100H TM50D (LV429673)	NSX100H TM80D (LV429671)	NSX100H TM63D (LV429672)	NSX100H TM100D (LV429670)	NSX100H TM80D (LV429671)
In (A)	63	50	80	63	100	80
Ir (A)	63	50	80	63	100	80
Im (A)	500 (fixed)	500 (fixed)	640 (fixed)	500 (fixed)	800 (fixed)	640 (fixed)

Specifications for 480 V Systems

In single mains systems, supply the UPS from a grounded 4-wire WYE service.

Schneider Electric also supports 3-wire single mains installations if the mains transformer is a grounded WYE transformer located in the same building. In this installation, the UPS system must be installed as a separately derived system. Leakage currents will occur in the bonding jumper and the technical/system earth.

In dual mains systems, use a 4-wire supply for the bypass and a 3-wire supply for the input. Both must be WYE sources. Delta input supply for either input or bypass is not permitted.

Input Specifications 480 V

UPS rating	20 kW	30 kW	40 kW	50 kW
Connections	4-wire (L1, L2, L3, N, PE) WYE (single mains) 3-wire (L1, L2, L3, PE) WYE (single mains or dual mains) ⁶			
Input voltage range (V)	408-552			
Frequency range (Hz)	40-70			
Nominal input current (A)	25	37	50	62
Maximum input current (A)	30	45	60	74
Input current limitation (A)	31	47	62	77
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%			
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)			
Maximum short circuit rating	65 kA RMS			
Protection	Built-in backfeed protection and fuses			
Ramp-in	Programmable and adaptive 1-40 seconds			

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

Bypass Specifications 480 V

UPS rating	20 kW	30 kW	40 kW	50 kW
Connections	4-wire (L1, L2, L3, N, PE) WYE 3-wire (L1, L2, L3, PE) WYE ⁷			
Bypass voltage range (V)	432-528			
Frequency range (Hz)	50/60 ± 1, 50/60 ± 3, 50/60 ± 10 (user selectable)			
Nominal bypass current (A)	24	36	49	61
Nominal neutral current (A)	42	62	83	104
Maximum short circuit rating ⁸	65 kA RMS			
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 200 A, prearcing 5.25 kA ² s			

Output Specifications 480 V

UPS rating	20 kW	30 kW	40 kW	50 kW
Connections ⁹	4-wire (L1, L2, L3, N, PE) 3-wire (L1, L2, L3, PE)			
Voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%			
Overload capacity	150% for 1 minute (in normal operation) 125% for 10 minutes (in normal operation) 125% for 1 minute (in battery operation) 125% continuous (bypass operation) 1000% for 100 milliseconds (bypass operation)			
Dynamic load response	± 5% after 2 milliseconds ± 1% after 50 milliseconds			
Output power factor	1			
Nominal output current (A)	24	36	48	60
Frequency regulation (Hz)	50/60 Hz bypass synchronized – 50/60 Hz ± 0.1% free-running			
Synchronized slew rate (Hz/sec)	Programmable to 0.25, 0.5, 1, 2, 4, 6			
Total harmonic distortion (THDU)	<1% for linear load <5% for non-linear load			
Load crest factor	2.5			
Load power factor	From 0.7 leading to 0.7 lagging without any derating			

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

8. Conditioned by the internal fuse rated 200 A, prearcing 5.25 kA²s.

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

Battery Specifications 480 V

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

All values are based on 40 battery blocks.

UPS rating	20 kW	30 kW	40 kW	50 kW
Charging power in % of output power at 0-40% load	80%			
Charging power in % of output power at 100% load	20%			
Maximum charging power (at 0-40% load) (kW)	16	24	32	40
Maximum charging power (at 100% load) (kW)	4	6	8	10
Nominal battery voltage (VDC)	480			
Nominal float voltage (VDC)	545			
Maximum boost voltage (VDC)	571			
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C			
End of discharge voltage (full load) (VDC)	384			
Battery current at full load and nominal battery voltage (A)	43	65	87	108
Battery current at full load and minimum battery voltage (A)	54	81	108	135
Ripple current	< 5% C20 (5 minute runtime)			
Battery test	Manual/automatic (selectable)			
Maximum short circuit rating	10 kA			

Recommended Cable Sizes 480 V

 **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All wiring must comply with all applicable national and/or electrical codes. The maximum allowable cable size is 1/0 AWG.

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

The maximum number of cable connections per busbar: 2 on input/output/bypass busbars; 2 on DC+/DC- busbars; 4 on N busbar; 5 on PE 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:

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

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

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

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

Copper	20 kW	30 kW	40 kW	50 kW
Input phases (AWG/kcmil)	8	6	4	3
Input PE (AWG/kcmil)	10	8	8	6
Bypass/output phases (AWG/kcmil)	10	8	6	4
Bypass PE/output PE (AWG/kcmil)	10	8	8	8
Neutral ¹⁰ (AWG/kcmil)	6	4	2	1/0
DC+/DC- ¹¹ (AWG/kcmil)	6	4	2	1/0
DC PE (AWG/kcmil)	8	6	6	6

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

10. Neutral conductor is sized to handle 1.73 times phase current in case of high harmonic content from non-linear loads. If non or less harmonic currents are expected, neutral conductor can be sized accordingly but not less than the phase conductor.
 11. Values are based on 40 battery blocks.

Recommended Upstream Protection 480 V

⚠ CAUTION
<p>HAZARD OF FIRE</p> <ul style="list-style-type: none"> Connect only to a circuit with the below specifications. Connect to a circuit provided with a 125 A branch circuit overcurrent protection maximum in accordance with the National Electrical Code, ANSI/NFPA70, and the Canadian Electrical Code, Part I, C22.1. <p>Failure to follow these instructions can result in injury or equipment damage.</p>

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

UPS rating	20 kW		30 kW		40 kW		50 kW	
	Input	Bypass	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36100U31X							
I _r (A)	40	35	60	50	80	70	100	80
tr @ 6 I _r	0.5							
I _i (x I _n)	1.5							

Specifications for 208 V Systems

Input Specifications 208 V

UPS rating	10 kW	15 kW	20 kW	25 kW
Voltage (V)	200/208/220	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, PE) WYE (single mains) 3-wire (L1, L2, L3, PE) WYE (dual mains)			
Input voltage range (V)	200 V: 170-230 208 V: 177-239 220 V: 187-253			
Frequency range (Hz)	40-70			
Nominal input current (A)	31/30/28	47/45/42	62/60/56	78/75/71
Maximum input current (A)	37/36/34	56/54/51	74/72/68	91/90/85
Input current limitation (A)	39/37/35	58/55/52	77/74/70	91/91/87
Input power factor	0.99 for load greater than 50% 0.95 for load greater than 25%			
Total harmonic distortion (THDI)	<3% at full linear load (symmetrical)			
Maximum short circuit rating	65 kA RMS			
Protection	Built-in backfeed protection and fuses			
Ramp-in	Programmable and adaptive 1-40 seconds			

Bypass Specifications 208 V

UPS rating	10 kW	15 kW	20 kW	25 kW
Voltage (V)	200/208/220	200/208/220	200/208/220	200/208/220
Connections	4-wire (L1, L2, L3, N, PE) WYE			
Bypass voltage range (V)	200 V: 180-220 208 V: 187-229 220 V: 198-242			
Frequency range (Hz)	50/60 ± 1, 50/60 ± 3, 50/60 ± 10 (user selectable)			
Nominal bypass current (A)	29/28/27	44/42/40	58/56/53	73/70/66
Nominal neutral current (A)	50/48/45	75/72/68	100/96/91	125/120/114
Maximum short circuit rating ¹²	65 kA RMS			
Protection	Built-in backfeed protection and fuses Internal fuse specifications: Rated 200 A, prearcing 5.25 kA ² s			

12. Conditioned by the internal fuse rated 200 A, prearcing 5.25 kA²s.

Output Specifications 208 V

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

Battery Specifications 208 V

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

All values are based on 40 battery blocks.

UPS rating	10 kW	15 kW	20 kW	25 kW
Charging power in % of output power at 0-40% load	80%			
Charging power in % of output power at 100% load	20%			
Maximum charging power (at 0-40% load) (kW)	8	12	16	20
Maximum charging power (at 100% load) (kW)	2	3	4	5
Nominal battery voltage (VDC)	480			
Nominal float voltage (VDC)	545			
Maximum boost voltage (VDC)	571			
Temperature compensation (per cell)	-3.3mV/°C, for T ≥ 25 °C – 0mV/°C, for T < 25 °C			
End of discharge voltage (full load) (VDC)	384			
Battery current at full load and nominal battery voltage (A)	22	33	44	55
Battery current at full load and minimum battery voltage (A)	27	41	54	68
Ripple current	< 5% C20 (5 minute runtime)			
Battery test	Manual/automatic (selectable)			
Maximum short circuit rating	10 kA			

Recommended Cable Sizes 208 V


DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All wiring must comply with all applicable national and/or electrical codes. The maximum allowable cable size is 1/0 AWG.

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

The maximum number of cable connections per busbar: 2 on input/output/bypass busbars; 2 on DC+/DC- busbars; 4 on N busbar; 5 on PE 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:

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

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

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

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

Copper	10 kW	15 kW	20 kW	25 kW
Input phases (AWG/kcmil)	8	4	3	2
Input PE (AWG/kcmil)	8	8	8	6
Bypass/output phases (AWG/kcmil)	8	6	4	3
Bypass PE/output PE (AWG/kcmil)	8	8	8	8
Neutral ¹³ (AWG/kcmil)	6	3	1	2 x 1/0
DC+/DC- ¹⁴ (AWG/kcmil)	10	8	6	4
DC PE (AWG/kcmil)	10	10	8	8

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

13. Neutral conductor is sized to handle 1.73 times phase current in case of high harmonic content from non-linear loads. If non or less harmonic currents are expected, neutral conductor can be sized accordingly but not less than the phase conductor.
 14. Values are based on 40 battery blocks.

Recommended Upstream Protection 208 V

⚠ CAUTION
<p>HAZARD OF FIRE</p> <ul style="list-style-type: none"> • Connect only to a circuit with the below specifications. • Connect to a circuit provided with a 125 A branch circuit overcurrent protection maximum in accordance with the National Electrical Code, ANSI/NFPA70, and the Canadian Electrical Code, Part I, C22.1. <p>Failure to follow these instructions can result in injury or equipment damage.</p>

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

UPS rating	10 kW		15 kW		20 kW		25 kW	
	Input	Bypass	Input	Bypass	Input	Bypass	Input	Bypass
Breaker type	HJF36100U31X						HJF36150-U31X	HJF36100-U31X
I _r (A)	50	40	80	60	100	80	125	100
tr @ 6 I _r	0.5							
li (x I _n)	1.5							

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	Crimping tool	Die
10 AWG	M6 x 20 mm	LCA10-14-L	CT-1570	NA
8 AWG	M6 x 20 mm	LCA8-14-L	CT-720	CD-720-1 Red P21
6 AWG	M6 x 20 mm	LCA6-14-L	CT-720	CD-720-1 Blue P24
4 AWG	M6 x 20 mm	LCA4-14-L	CT-720	CD-720-1 Gray P29
3 AWG	M6 x 20 mm	LCA4-14-L	CT-720	CD-720-1 Gray P29
2 AWG	M6 x 20 mm	LCA4-14-L	CT-720	CD-720-1 Brown P33
1 AWG	M6 x 20 mm	LCA1-14-E	CT-720	CD-720-2 Green P37
1/0 AWG	M6 x 20 mm	LCA1/0-14-X	CT-720	CD-720-2 Pink P42
2/0 AWG	M6 x 20 mm	LCA2/0-14-X	CT-720	CD-720-2 Black P45
3/0 AWG	M6 x 20 mm	LCA3/0-14-X	CT-720	CD-720-2 Orange P50
4/0 AWG	M6 x 20 mm	LCA4/0-14-X	CT-720	CD-720-3 Purple P54

Torque Specifications

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

Environment

	Operating	Storage
Temperature	0 °C to 40 °C (32 °F to 104 °F)	-15 °C to 40 °C (5 °F to 104 °F) for systems with batteries.
Relative humidity	0 - 95% non-condensing	10 - 80% non-condensing
Elevation	Designed for operation in 0-3000 m (0-10000 feet) elevation. Power derating required from 1000-3000 m (3300-10000 feet): Up to 1000 m (3300 feet): 1.000 Up to 1500 m (5000 feet): 0.975 Up to 2000 m (6600 feet): 0.950 Up to 2500 m (8300 feet): 0.925 Up to 3000 m (10000 feet): 0.900	
Audible noise one meter (three feet) from unit	400 V 10-20 kW: 49 dB at 70% load, 55 dB at 100% load 400 V 30-50 kW: 54 dB at 70% load, 61 dB at 100% load 480 V 20 kW and 208 V 10 kW: 49 dB at 70% load, 55 dB at 100% load 480 V 30-50 kW and 208 V 15-25 kW: 54 dB at 70% load, 61 dB at 100% load	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

UPS Weights and Dimensions

	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
10-20 kW 400 V UPS with one battery string	330 (727.52)	1485 (58.46)	521 (20.51)	847 (33.35)
30-50 kW 400 V UPS with two battery strings	460 (1014.12)	1485 (58.46)	521 (20.51)	847 (33.35)
20-50 kW 480 V UPS with two battery strings	460 (1014.12)	1485 (58.46)	521 (20.51)	847 (33.35)
10 kW 208 V UPS with one battery string	330 (727.52)	1485 (58.46)	521 (20.51)	847 (33.35)
15-25 kW 208 V UPS with two battery strings	460 (1014.12)	1485 (58.46)	521 (20.51)	847 (33.35)

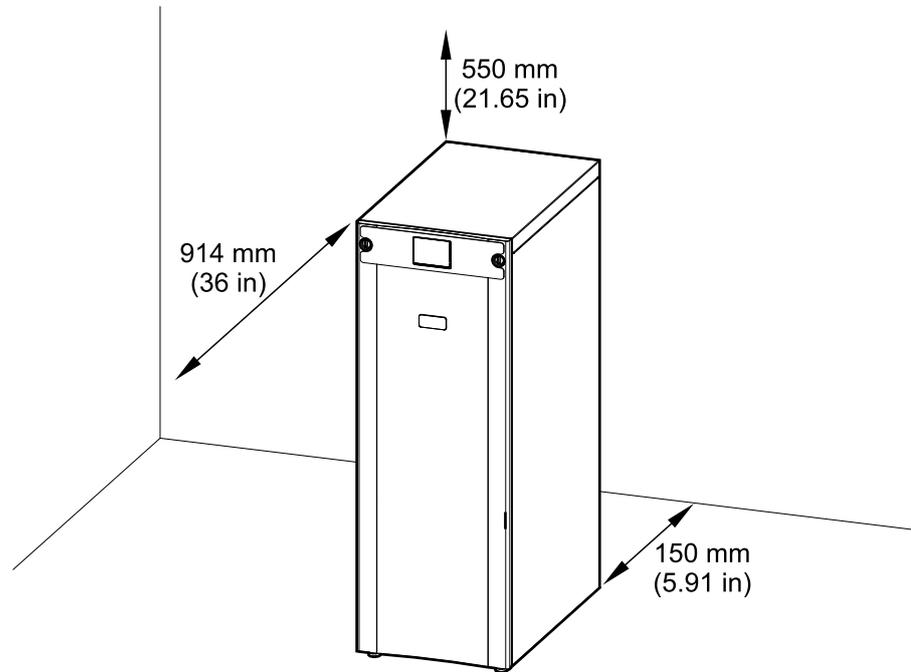
NOTE: One battery module weighs approximately 32 kg (70.5 lbs).

Clearance

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

NOTE: The required minimum rear clearance is 150 mm (5.91 in).

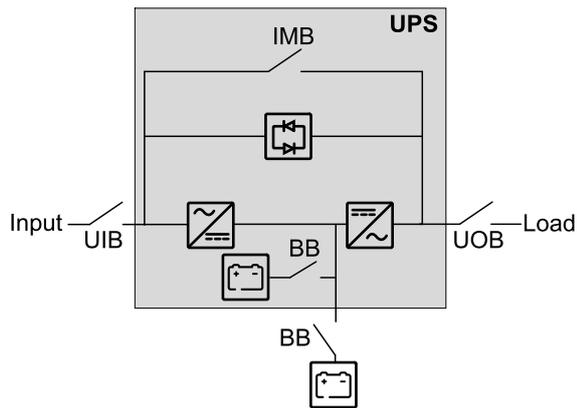
Front View of the UPS



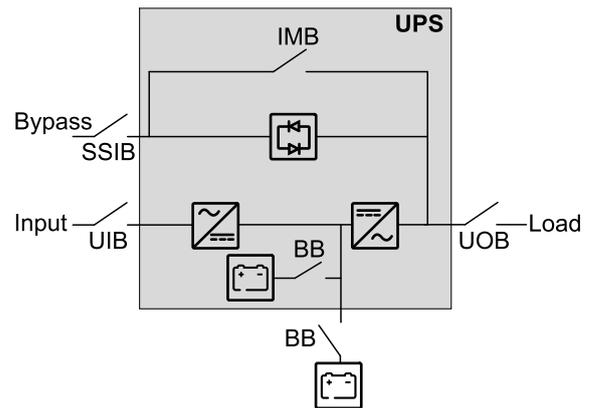
Single System Overview

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

Single System – Single Mains



Single System – Dual Mains



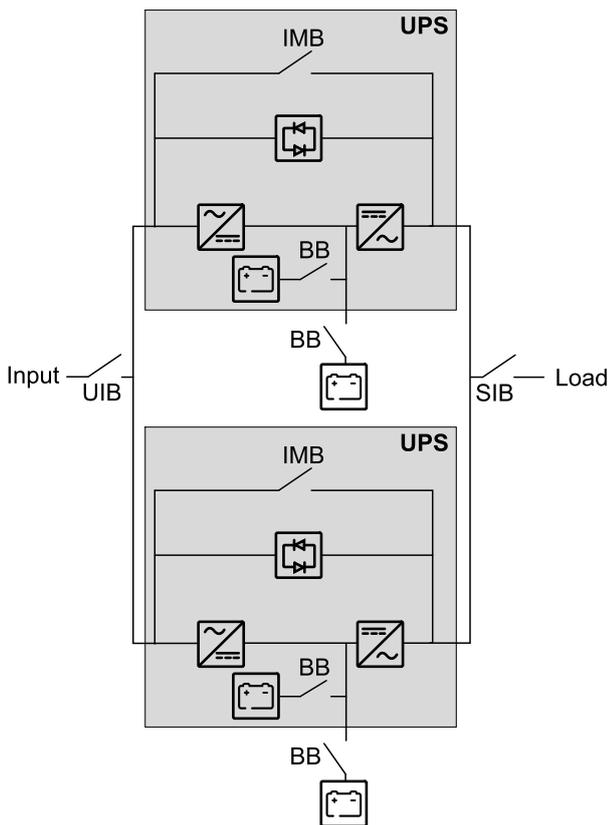
Parallel System Overview

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

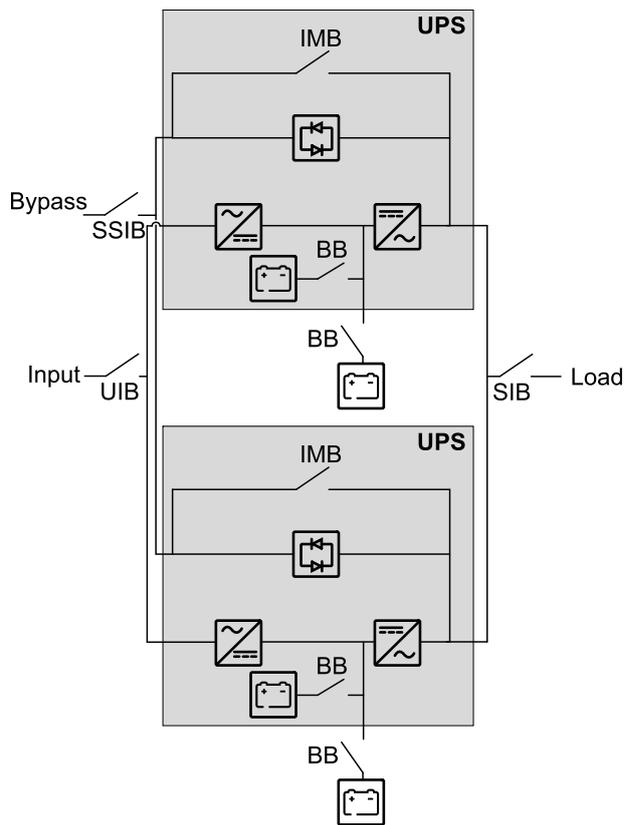
Simplified 1+1 Parallel Systems

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

Simplified 1+1 Parallel System – Single Mains



Simplified 1+1 Parallel System – Dual Mains

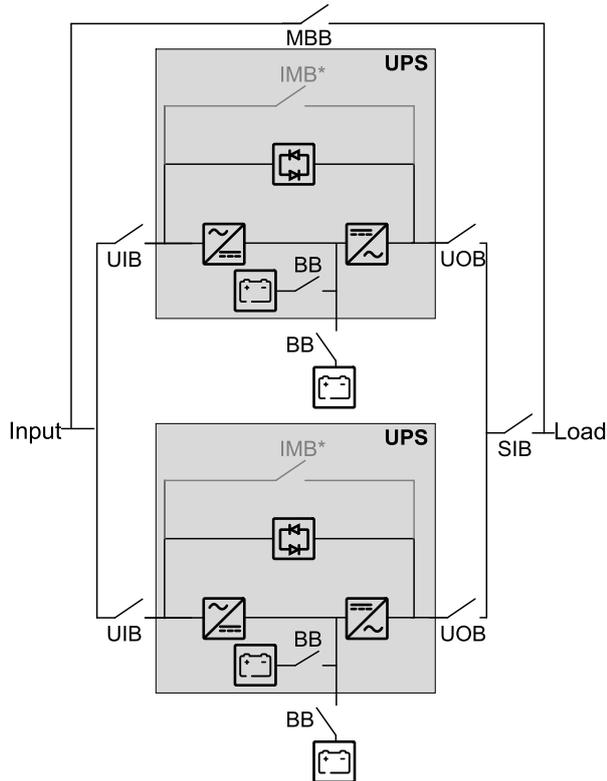


Parallel Systems with Individual Unit Input Breaker UIB and Static Switch Input Breaker SSIB

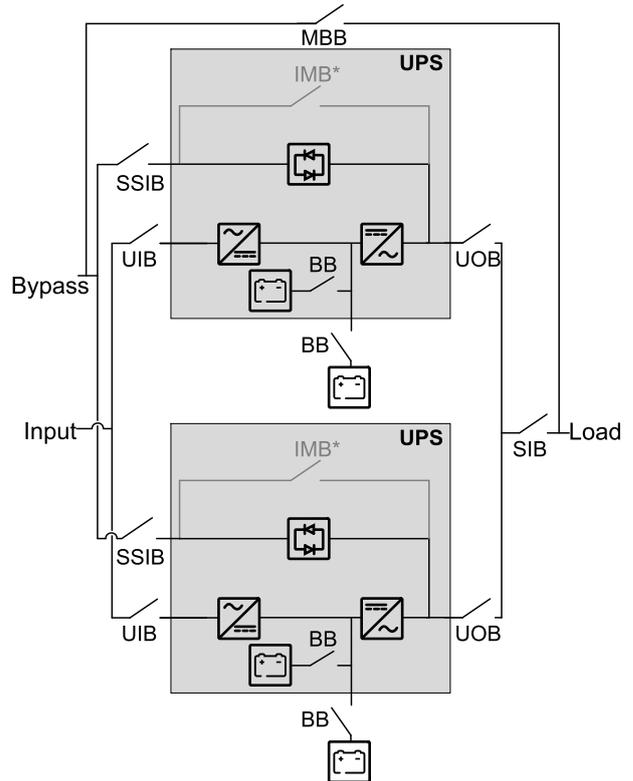
Galaxy VS can support up to 3 UPSs in parallel for capacity and up to 3+1 UPSs in parallel for redundancy with individual unit input breaker UIB and static switch input breaker SSIB.

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

Parallel System – Single Mains



Parallel System – Dual Mains

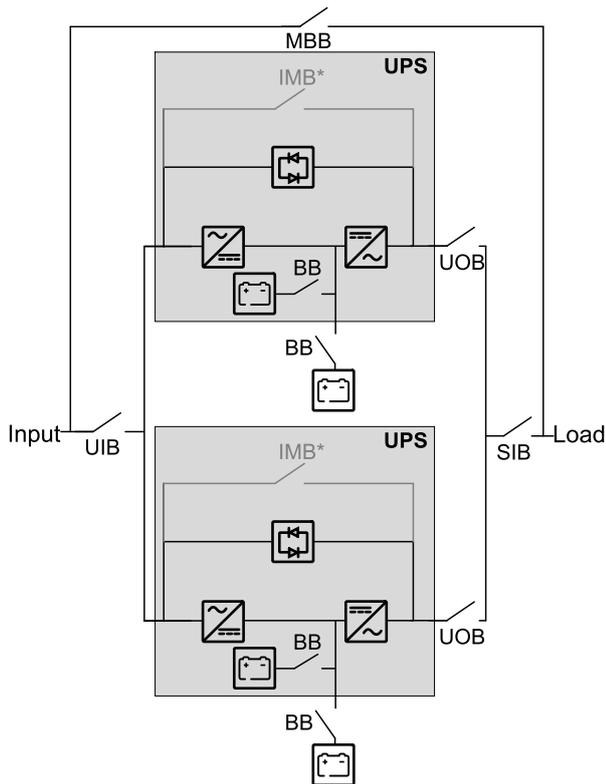


Parallel Systems with Shared Unit Input Breaker UIB and Static Switch Input Breaker SSIB

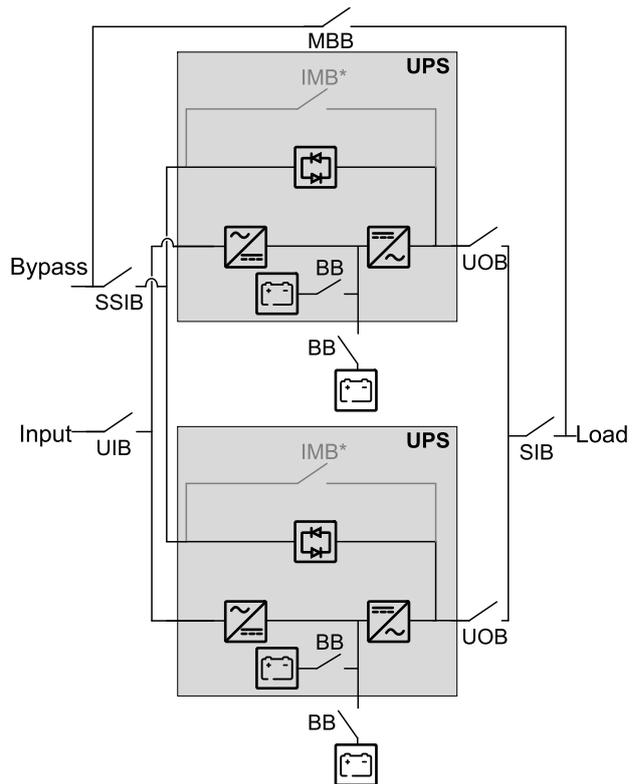
Galaxy VS can support up to 3 UPSs in parallel for capacity and up to 3+1 UPSs in parallel for redundancy with shared unit input breaker UIB and static switch input breaker SSIB.

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

Parallel System – Single Mains



Parallel System – Dual Mains



Overview of Installation Kits

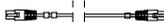
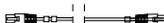
Installation Kit 0M-88357

Part	Used in	Number of units
USB cable	<i>Connect the Modbus Cables, page 56.</i>	1 
150 Ohm resistor		10 
Terminal connector		2 

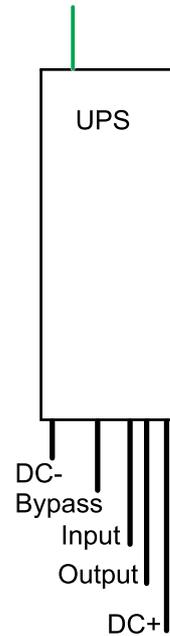
Optional Seismic Kit GVSOPT002

Part	Used in	Number of units
M8 x 20 mm bolt with washer	<i>Install the Seismic Anchoring (Option), page 40.</i>	12 
Rear anchor		1 
Rear anchoring bracket		1 
Front anchoring bracket		1 
Rear connection plate	Used for installation with an adjacent product. Follow instructions in the installation manual for the adjacent product.	1 

Optional Parallel Kit GVSOPT006

Part	Used in	Number of units
PBUS1 cable 0W6268	<i>Connect the PBUS Cables, page 54.</i>	1 
PBUS2 cable 0W6267		1 
AUX switch	<i>Connect the IMB Signal Cables in a Simplified 1+1 Parallel System, page 52.</i>	2 
This kit contains parts for use with other UPS models which are not relevant for this installation.		

Installation Procedure for Single System

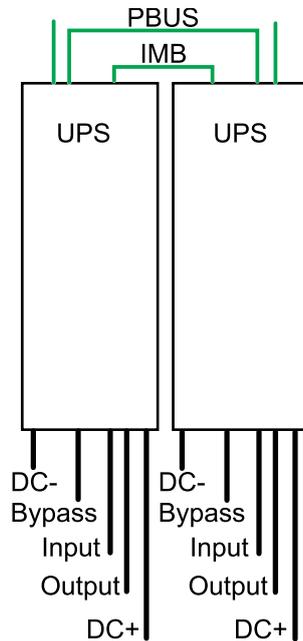


— Signal cable
— Power cable

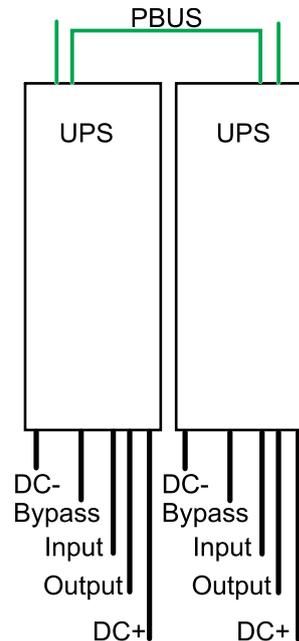
1. *Prepare for Installation*, page 36.
2. *Install the Seismic Anchoring (Option)*, page 40.
3. Perform one of the following:
 - *Connect the Power Cables in Single Mains System*, page 41, or
 - *Connect the Power Cables in Dual Mains System*, page 43.
4. *Connect the Power Cables from an Adjacent Modular Battery Cabinet*, page 45.
5. *Connect the Signal Cables*, page 47.
6. *Connect the Signal Cables from a Modular Battery Cabinet*, page 49.
7. *Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products*, page 50.
8. *Connect the External Communication Cables*, page 55.
9. *Add Translated Safety Labels to Your Product*, page 58.
10. *Final Installation*, page 59.

Installation Procedure for Parallel Systems

Simplified 1+1 Parallel System



Parallel System



— Signal cable
— Power cable

1. *Prepare for Installation*, page 36.
2. *Install the Seismic Anchoring (Option)*, page 40.
3. Perform one of the following:
 - *Connect the Power Cables in Single Mains System*, page 41, or
 - *Connect the Power Cables in Dual Mains System*, page 43.
4. *Connect the Power Cables from an Adjacent Modular Battery Cabinet*, page 45.
5. *Connect the Signal Cables*, page 47.
6. *Connect the Signal Cables from a Modular Battery Cabinet*, page 49.
7. *Connect the Signal Cables from Switchgear and Third-Party Auxiliary Products*, page 50.
8. Perform one of the following:
 - **For simplified 1+1 parallel system:** *Connect the IMB Signal Cables in a Simplified 1+1 Parallel System*, page 52.
 - **For parallel system:** Install a padlock on the internal maintenance breaker IMB in the open position on all UPSs in the parallel system.
9. *Connect the PBUS Cables*, page 54.
10. *Connect the External Communication Cables*, page 55.
11. *Add Translated Safety Labels to Your Product*, page 58.
12. *Final Installation*, page 59.

Prepare for Installation

⚡ ⚠ DANGER

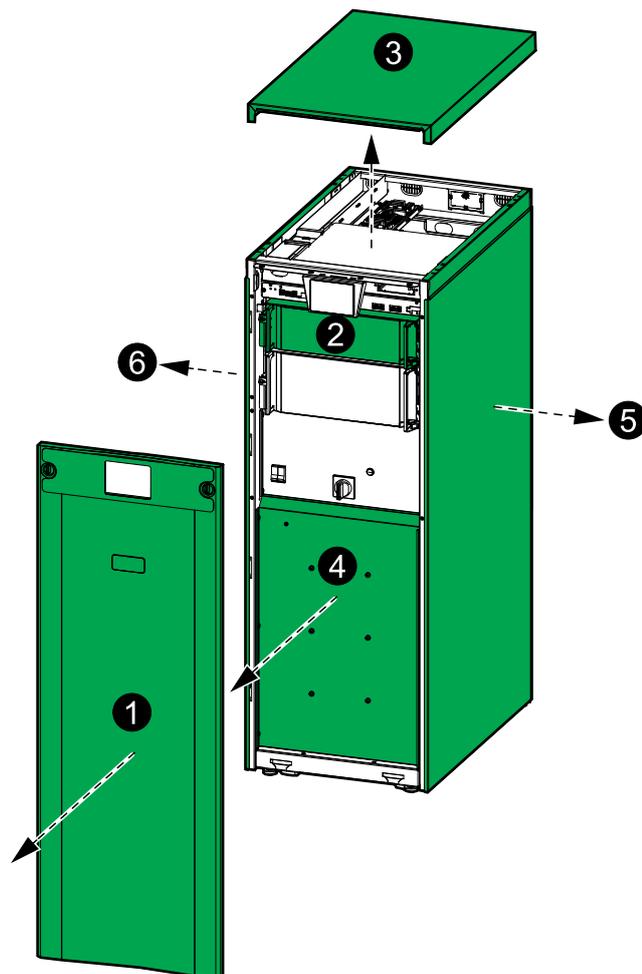
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

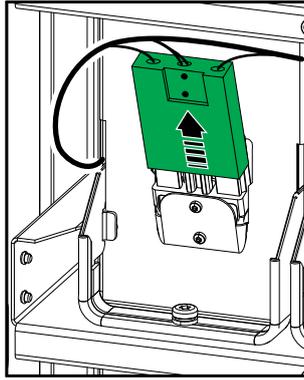
Failure to follow these instructions will result in death or serious injury.

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

1. Remove the front panel.
2. **For UPS without preinstalled power module:** Install the power module:
 - a. Remove the screw in each side of the empty power module shelf.
 - b. Push the power module onto the shelf.
 - c. Reinstall the screw in each side of the shelf.
3. Remove the top cover:
 - a. Remove the screws and tilt the front of the top cover upwards.
 - b. Slide the top cover towards the rear to remove it. Taps in the rear of the top cover must disconnect from the slots in the rear of the UPS.

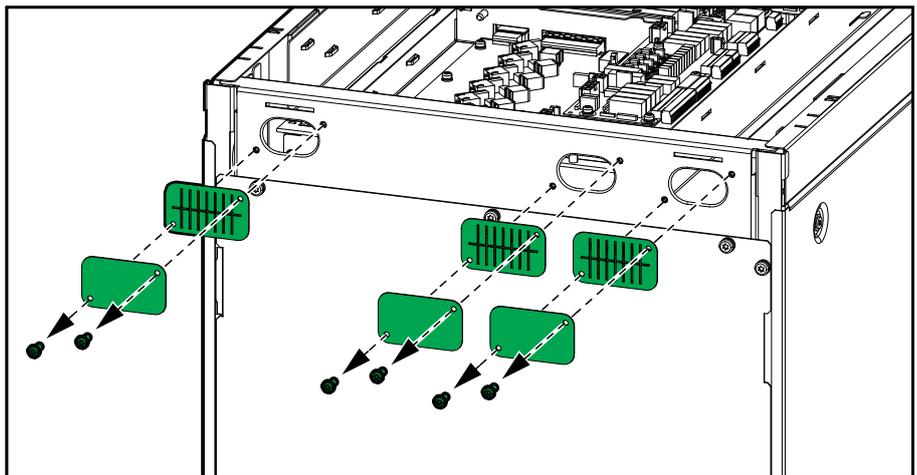


4. Remove the battery cover. Disconnect the battery terminals from the front of the battery modules.



5. **For installation with a maintenance bypass cabinet:** Remove the right side panel. The side panel will be reinstalled on the maintenance bypass cabinet.
6. **For installation with an adjacent modular battery cabinet:** Remove the left side panel.
7. Remove the rear gland plates and the rear brush plates from the UPS. These are for signal cable routing.

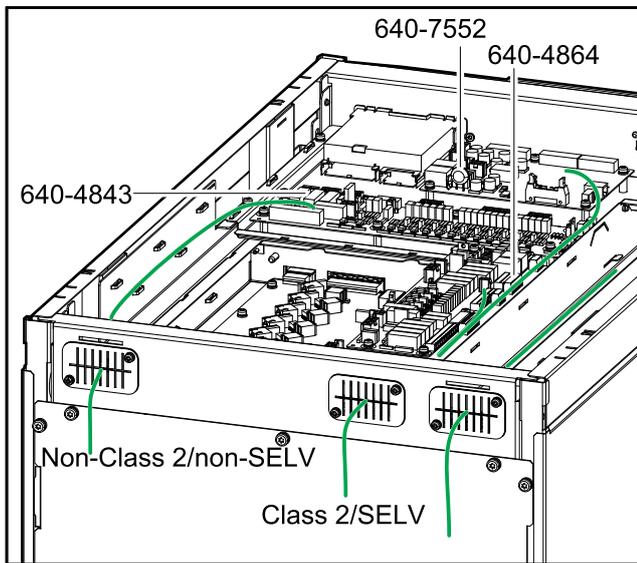
Rear View of the UPS



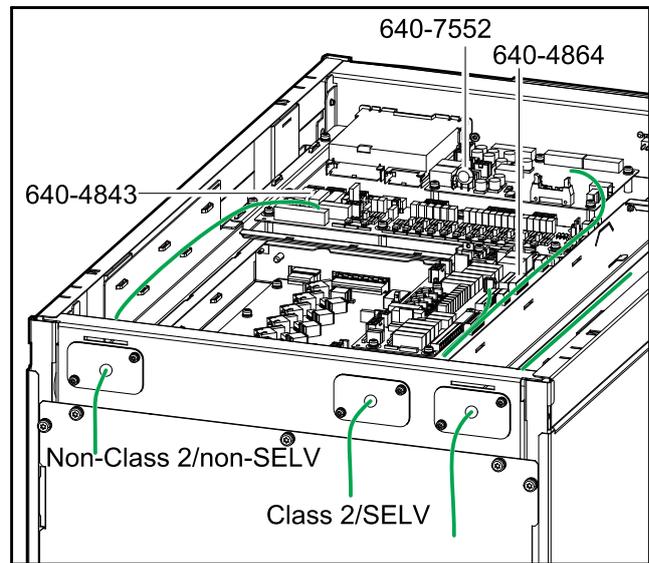
8. Perform one of the following:
 - **For installation without conduits:** Reinstall the brush plates.
 - **For installation with conduits:** Drill a hole in the gland plates for conduits, install conduits, and reinstall the gland plates.
9. Route the non-Class 2/non-SELV signal cables through the left rear brush/gland plate and into the UPS.
10. Route the Class 2/SELV signal cables through the middle rear brush/gland plate and into the UPS.

- Route the external communication cables that connect to the controller box through the right rear brush/gland plate and through the cable channel to the front of the UPS.

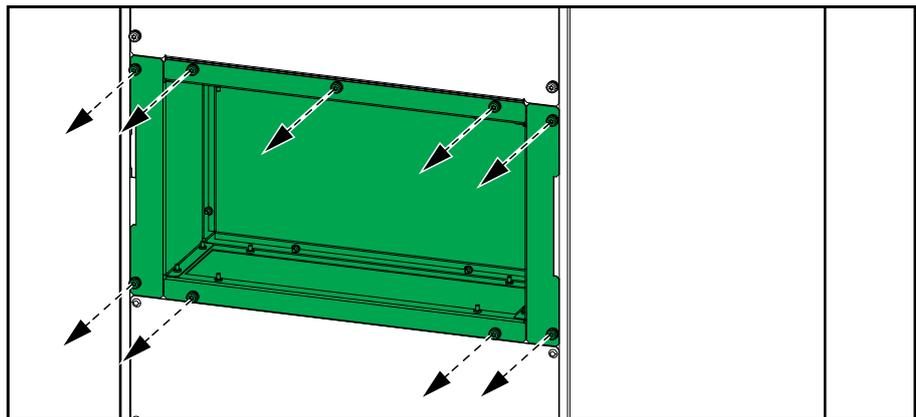
Rear View of the UPS without Conduits



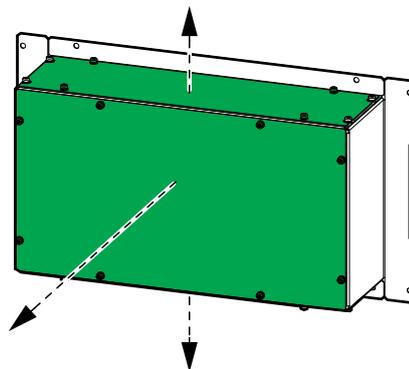
Rear View of the UPS with Conduits



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

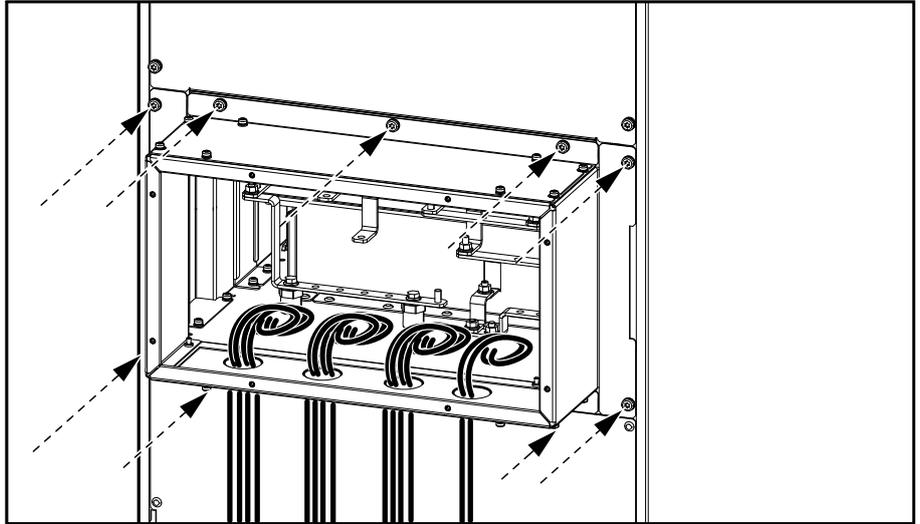


- Remove the rear plate and the top or bottom gland plate from the conduit box.



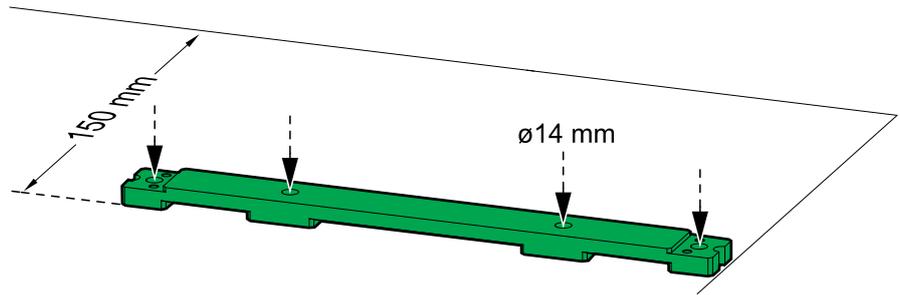
- Drill/punch holes for power cables/conduits in the top or bottom gland plate. Install conduits (not provided), if applicable.
- Reinstall the top or bottom gland plate on the conduit box.

16. Install the conduit box on the UPS. Note that the conduit box is installed in the reverse position.



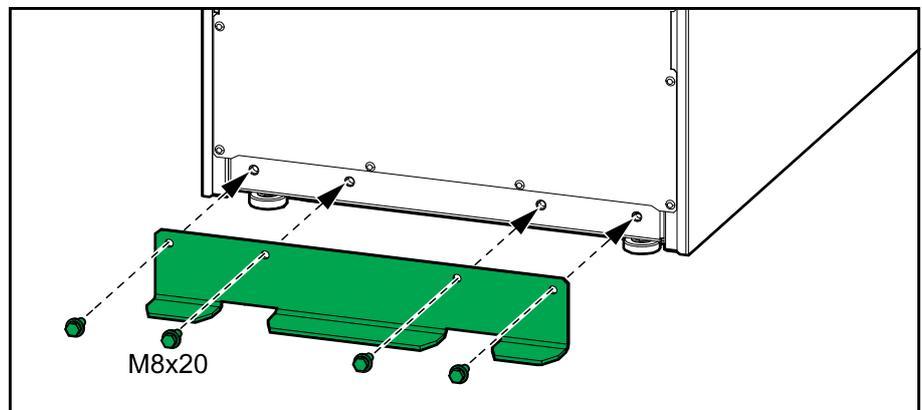
Install the Seismic Anchoring (Option)

1. Mount the rear anchor(s) to the floor. Use appropriate hardware for the floor type – the hole diameter in the rear anchor is $\varnothing 14$ mm.



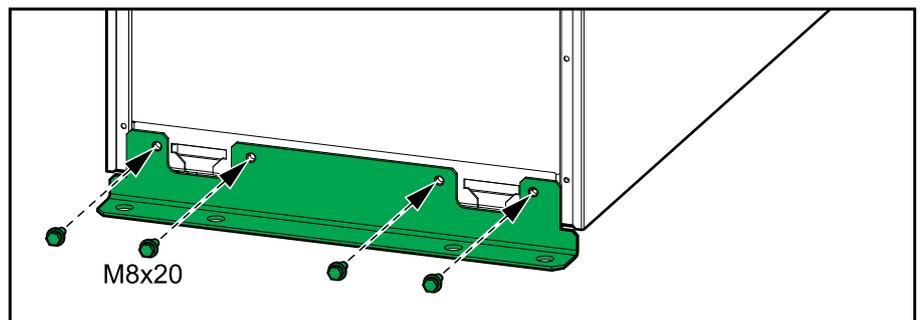
2. Install the rear anchoring bracket on the UPS with the provided M8 bolts.

Rear View of the UPS



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

Front View of the UPS



NOTE: Do not push the UPS into position yet.

Connect the Power Cables in Single Mains System

NOTICE

RISK OF EQUIPMENT DAMAGE

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

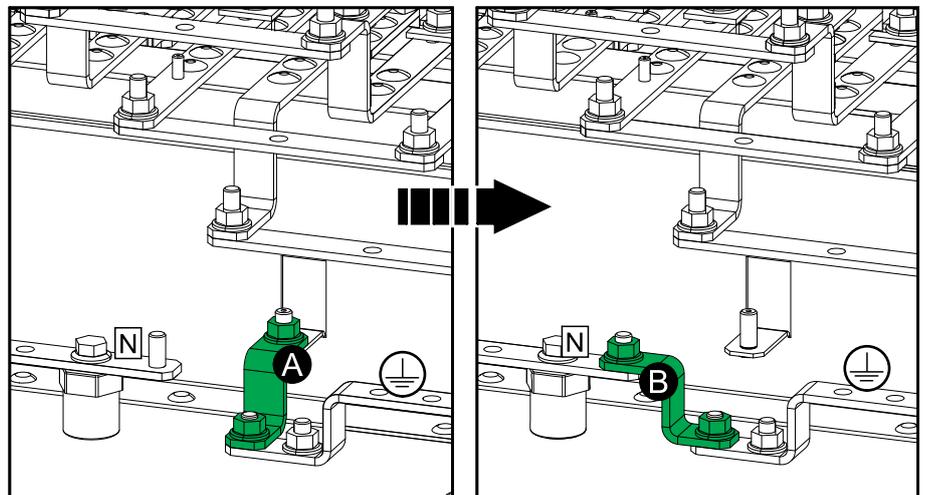
- All output cables must be the same length for all UPSs.
- All input cables must be the same length for all UPSs.

Failure to follow these instructions can result in equipment damage.

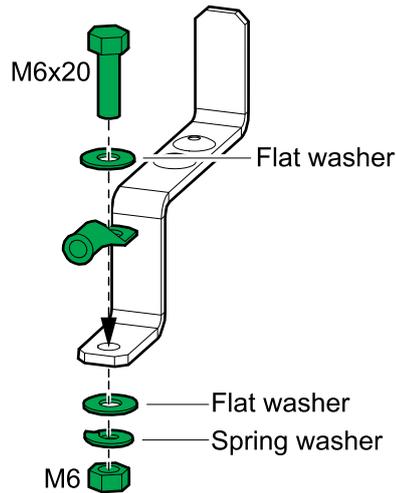
NOTE: The UPS is preconfigured for TNS earthing system. 3-wire installation using a bonding busbar will result in a higher leakage current.

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

Rear View of UPS

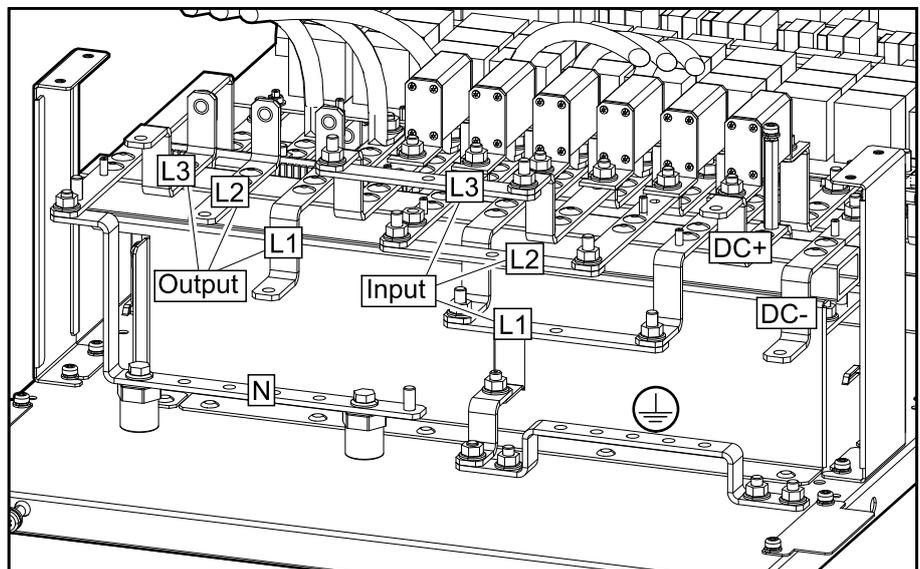


2. Connect the power cables as shown:



- a. Connect the PE cables.
- b. Connect the input cables.
- c. Connect the output cables.
- d. **For installation with a remote modular battery cabinet:** Connect the DC cables to the DC busbars.
- e. **For installation with an adjacent modular battery cabinet:** See *Connect the Power Cables from an Adjacent Modular Battery Cabinet*, page 45.

Rear View of UPS – Single Mains System



⚠ CAUTION

RISK OF EQUIPMENT DAMAGE

Check the fastening of the cable lugs. If the cable lugs move due to pulling on cables, the bolt can become loose.

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

Connect the Power Cables in Dual Mains System

NOTICE

RISK OF EQUIPMENT DAMAGE

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

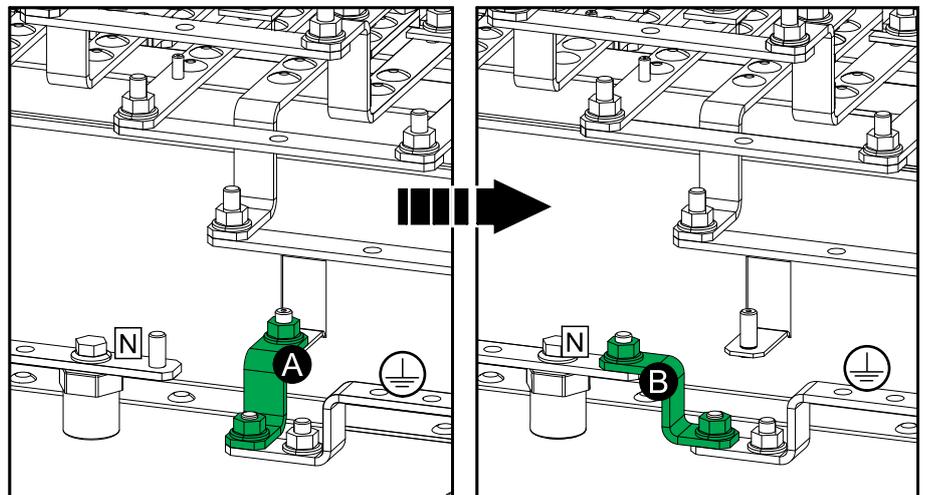
- All bypass cables must be the same length for all UPSs.
- All output cables must be the same length for all UPSs.

Failure to follow these instructions can result in equipment damage.

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

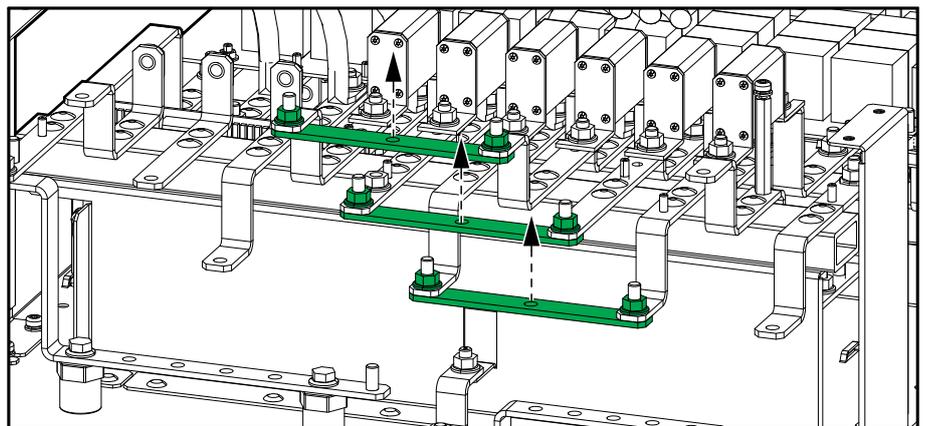
1. **Only for TN-C/3-wire earthing system:** Move the bonding busbar from position (A) to position (B) to connect the N busbar to the PE busbar.

Rear View of UPS

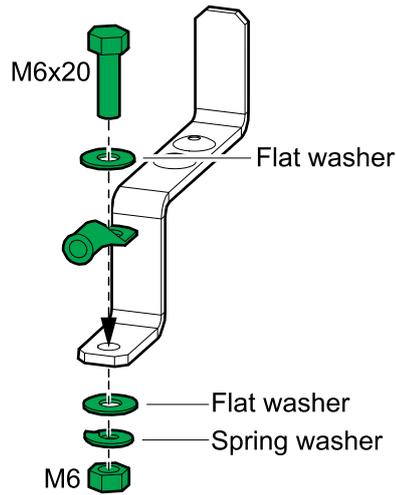


2. Remove the three single mains jumper busbars.

Rear View of UPS – Dual Mains System

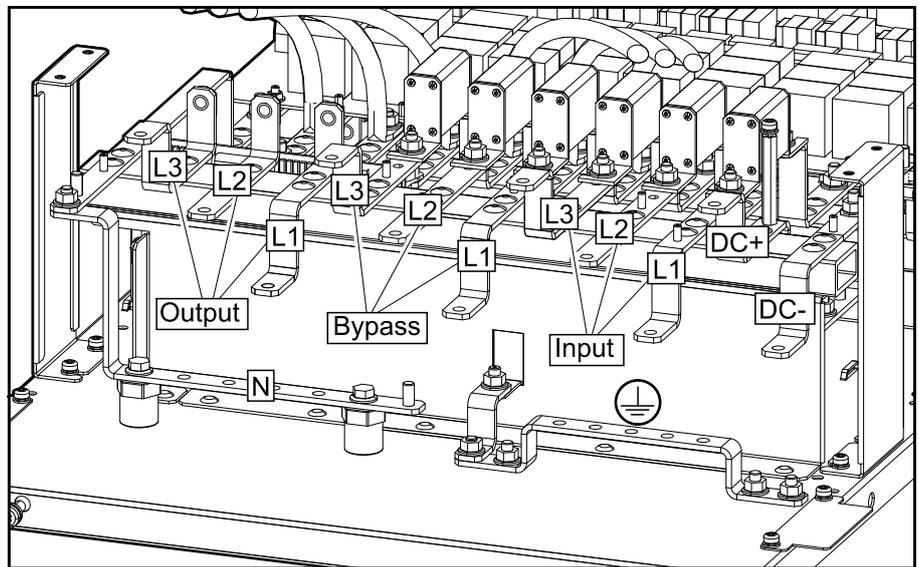


3. Connect the power cables as shown:



- a. Connect the PE cables.
- b. Connect the input cables.
- c. Connect the bypass cables.
- d. Connect the output cables.
- e. **For installation with a remote modular battery cabinet:** Connect the DC cables to the DC busbars.
- f. **For installation with an adjacent modular battery cabinet:** See *Connect the Power Cables from an Adjacent Modular Battery Cabinet, page 45.*

Rear View of UPS – Dual Mains System



CAUTION

RISK OF EQUIPMENT DAMAGE

Check the fastening of the cable lugs. If the cable lugs move due to pulling on cables, the bolt can become loose.

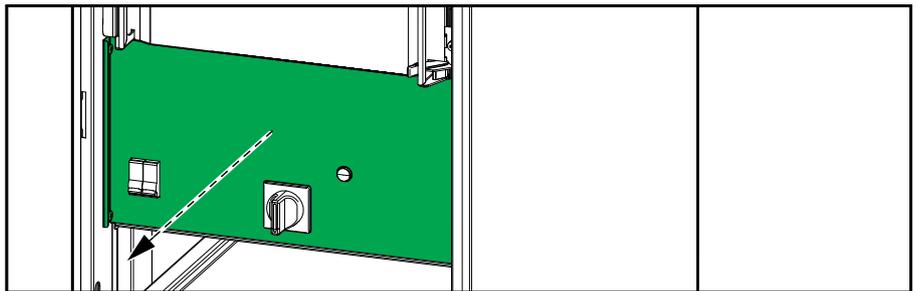
Failure to follow these instructions can result in injury or equipment damage.

Connect the Power Cables from an Adjacent Modular Battery Cabinet

NOTE: The PE cable (0W49449), the DC cables (0W49426), and the needed bolts and nuts to connect the cables are provided with the modular battery cabinet.

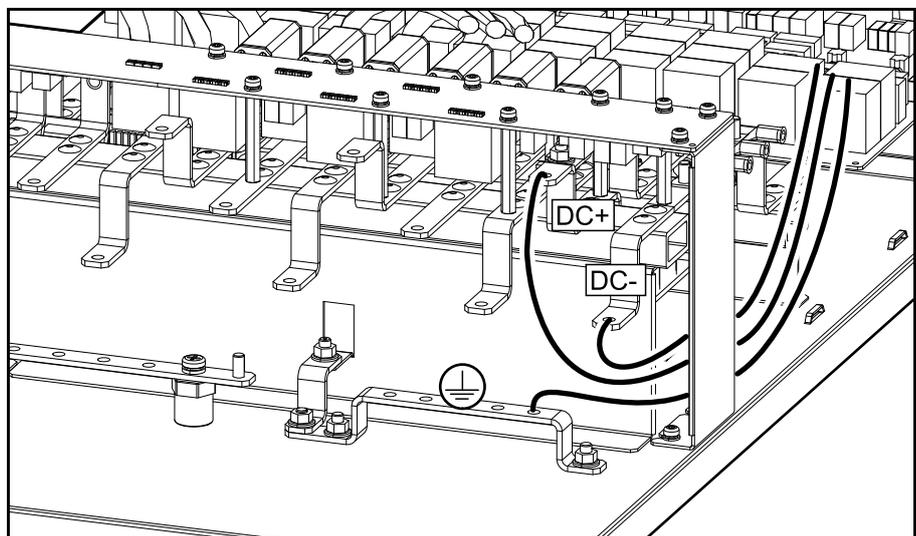
1. Set the battery breaker BB to the open (OFF) position and disconnect the battery terminals from the front of the battery modules in the modular battery cabinet(s).
2. Remove the front plate on the UPS.

Front View of the UPS



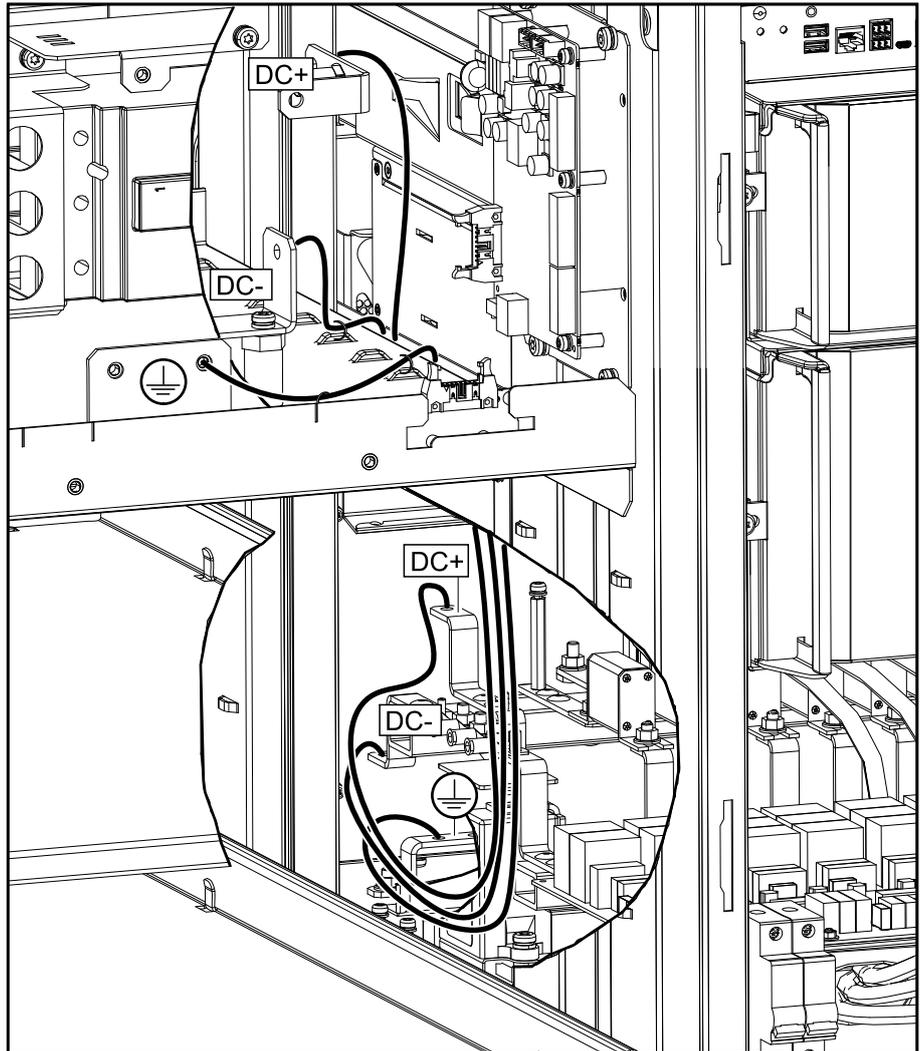
3. Connect the PE cable (0W49449) to the PE busbar in the UPS.
4. Connect the DC cables (0W49426) to the DC busbars in the UPS.
5. Route the PE cable and the DC cables from the rear of the UPS towards the front and up in the gap between modular battery cabinet 1 and the UPS.

Rear View of the UPS



6. Route the PE cable and the DC cables into modular battery cabinet 1 and connect the PE cable and DC cables in modular battery cabinet 1.

Front View of Adjacent Modular Battery Cabinet 1 and the UPS



7. Reinstall the front plate.

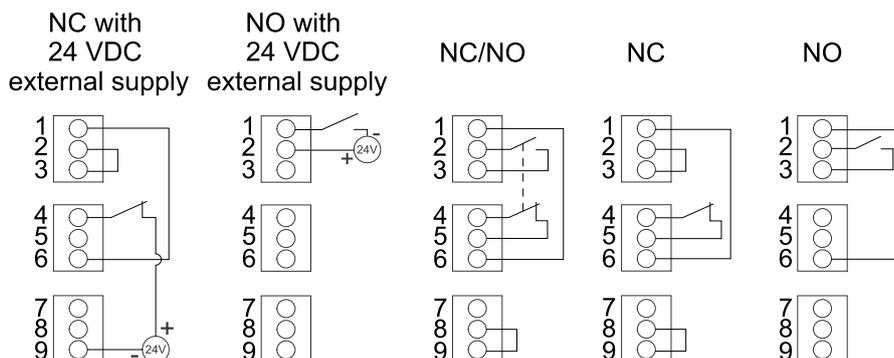
Connect the Signal Cables

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

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

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



The EPO input supports 24 VDC.

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

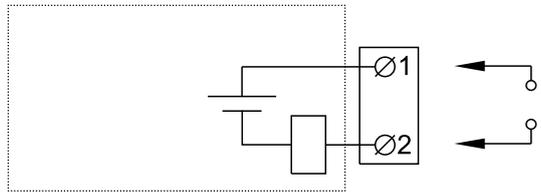
If you want the EPO activation to transfer the UPS into forced static bypass operation instead, please contact Schneider Electric.

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

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

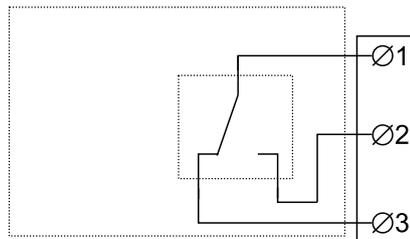
Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.

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



Name	Description	Location
IN_1 (input contact 1)	Configurable input contact	640-4864 terminal J6616, 1–2
IN_2 (input contact 2)	Configurable input contact	640-4864 terminal J6616, 3–4
IN_3 (input contact 3)	Configurable input contact	640-4864 terminal J6616, 5–6
IN_4 (input contact 4)	Configurable input contact	640-4864 terminal J6616, 7–8

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



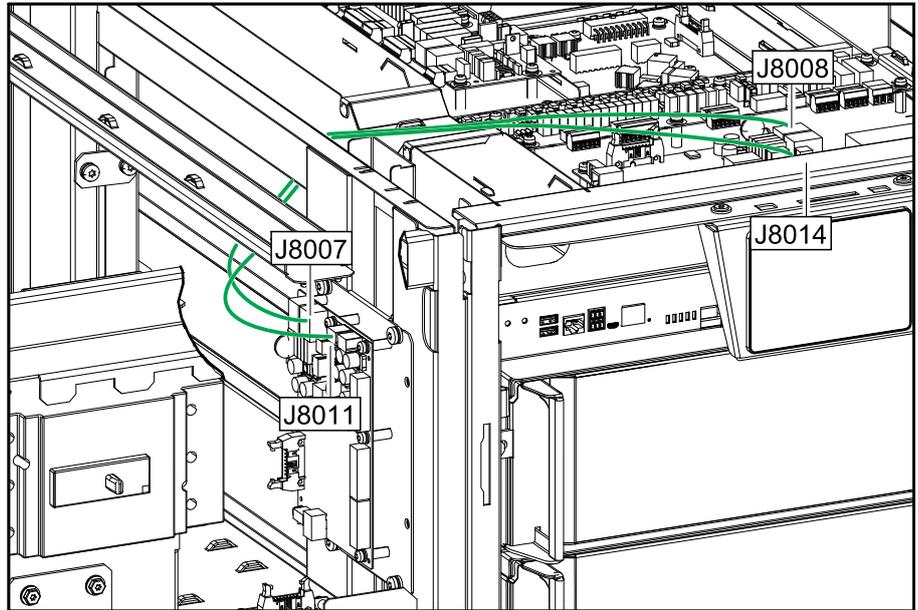
Name	Description	Location
OUT_1 (output relay 1)	Configurable output relay	640–4864 terminal J6617, 1–3
OUT_2 (output relay 2)	Configurable output relay	640–4864 terminal J6617, 4–6
OUT_3 (output relay 3)	Configurable output relay	640–4864 terminal J6617, 7–9
OUT_4 (output relay 4)	Configurable output relay	640–4864 terminal J6617, 10–12

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

Connect the Signal Cables from a Modular Battery Cabinet

1. Route the signal cables from modular battery cabinet 1 through the left side of the UPS (for an adjacent modular battery cabinet) or through the rear of the UPS (for a remote modular battery cabinet).

Front View of Adjacent Modular Battery Cabinet 1 and the UPS

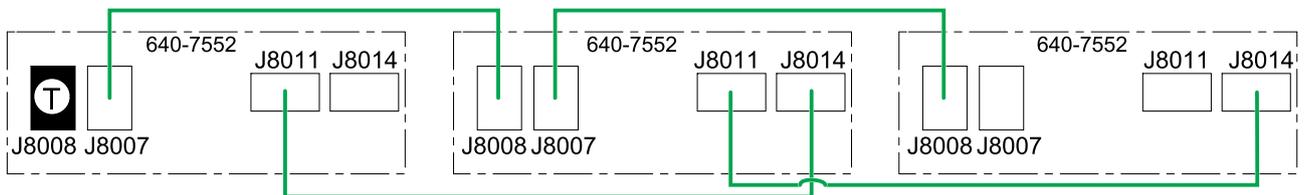


2. Connect the signal cables from modular battery cabinet 1 to the UPS:
 - a. Disconnect the termination plug from J8008 on board 640-7552 in the UPS.
 - b. Mount the termination plug in J8008 on board 640-7552 in the last modular battery cabinet (T).
 - c. Connect the signal cable from J8011 on board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

Modular Battery Cabinet 2,3,4

Modular Battery Cabinet 1

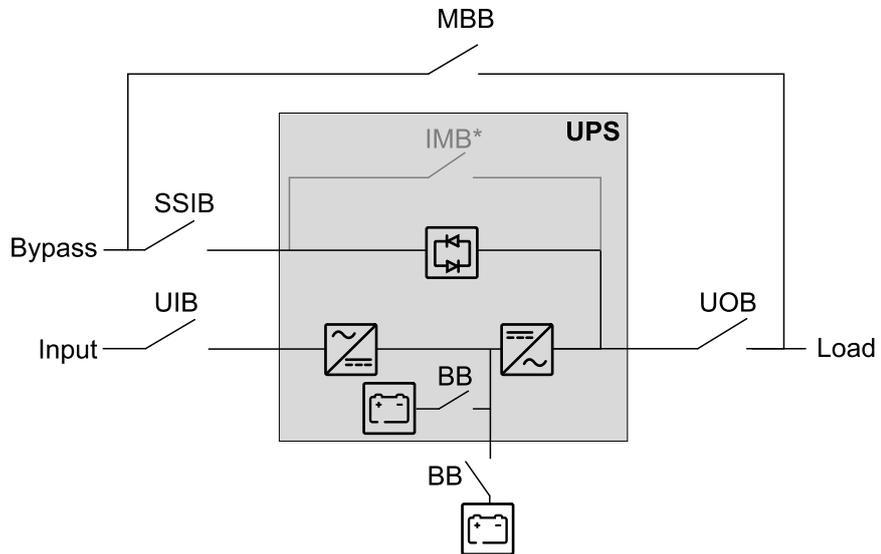
UPS



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

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

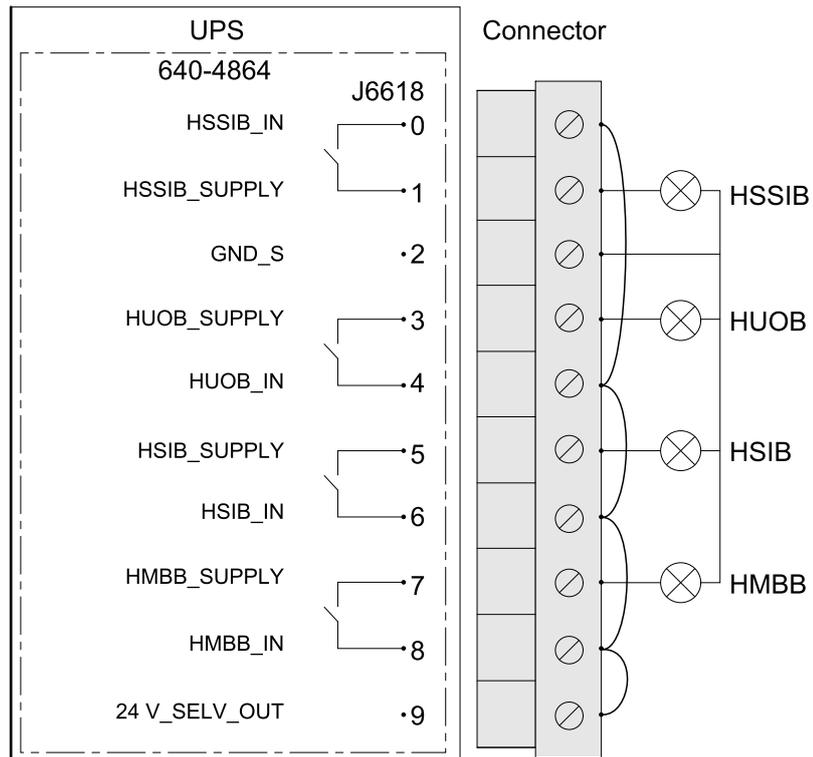
Example of Single System with Third-Party Switchgear



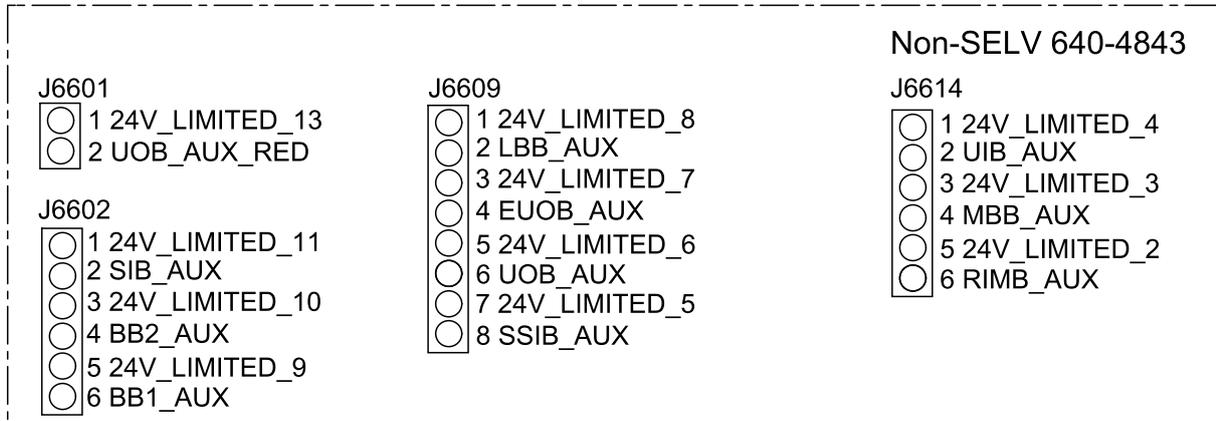
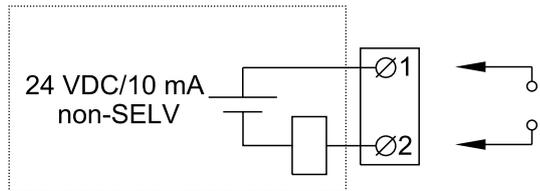
NOTE: The internal maintenance breaker IMB* cannot be used in a system with an external maintenance bypass breaker MBB and the internal maintenance breaker IMB* must be padlocked in the open position.

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

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



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



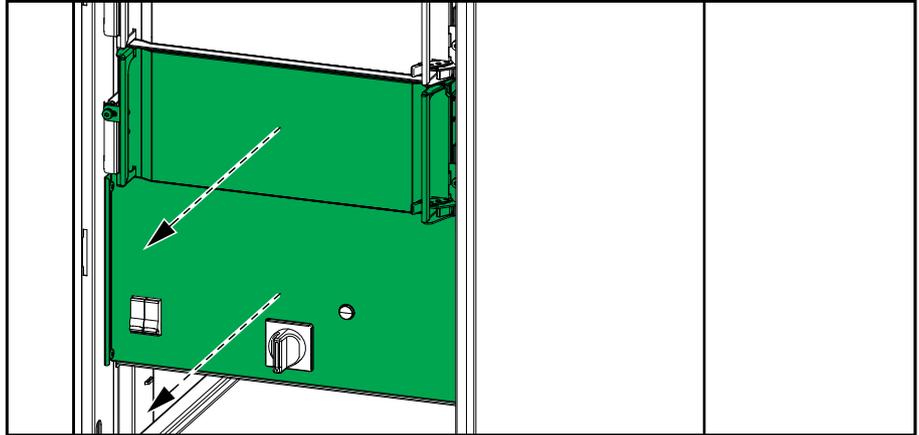
Terminal number	Function	Connection
J6601	UOB_RED (redundant AUX switch in unit output breaker)	Connect to redundant AUX switch in unit output breaker UOB.
J6602	SIB (system isolation breaker)	Connect to normally open (NO) AUX switch in system isolation breaker SIB for parallel system. SIB must contain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

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

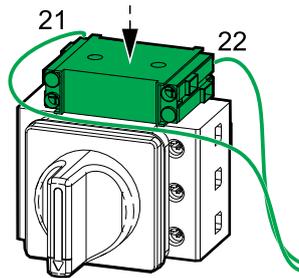
NOTE: Route the signal cables separately from the power cables to ensure sufficient isolation.

1. Remove the static switch module and the front plate from both UPSs.

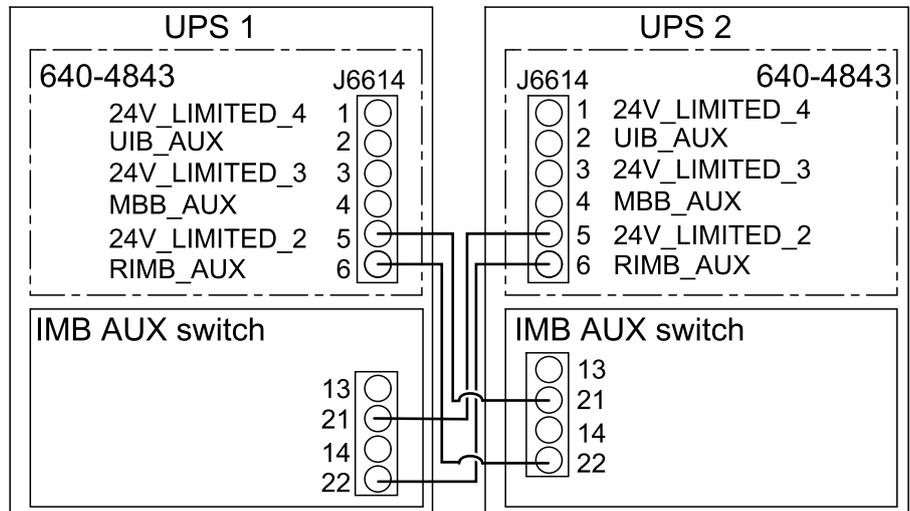
Front View of the UPS



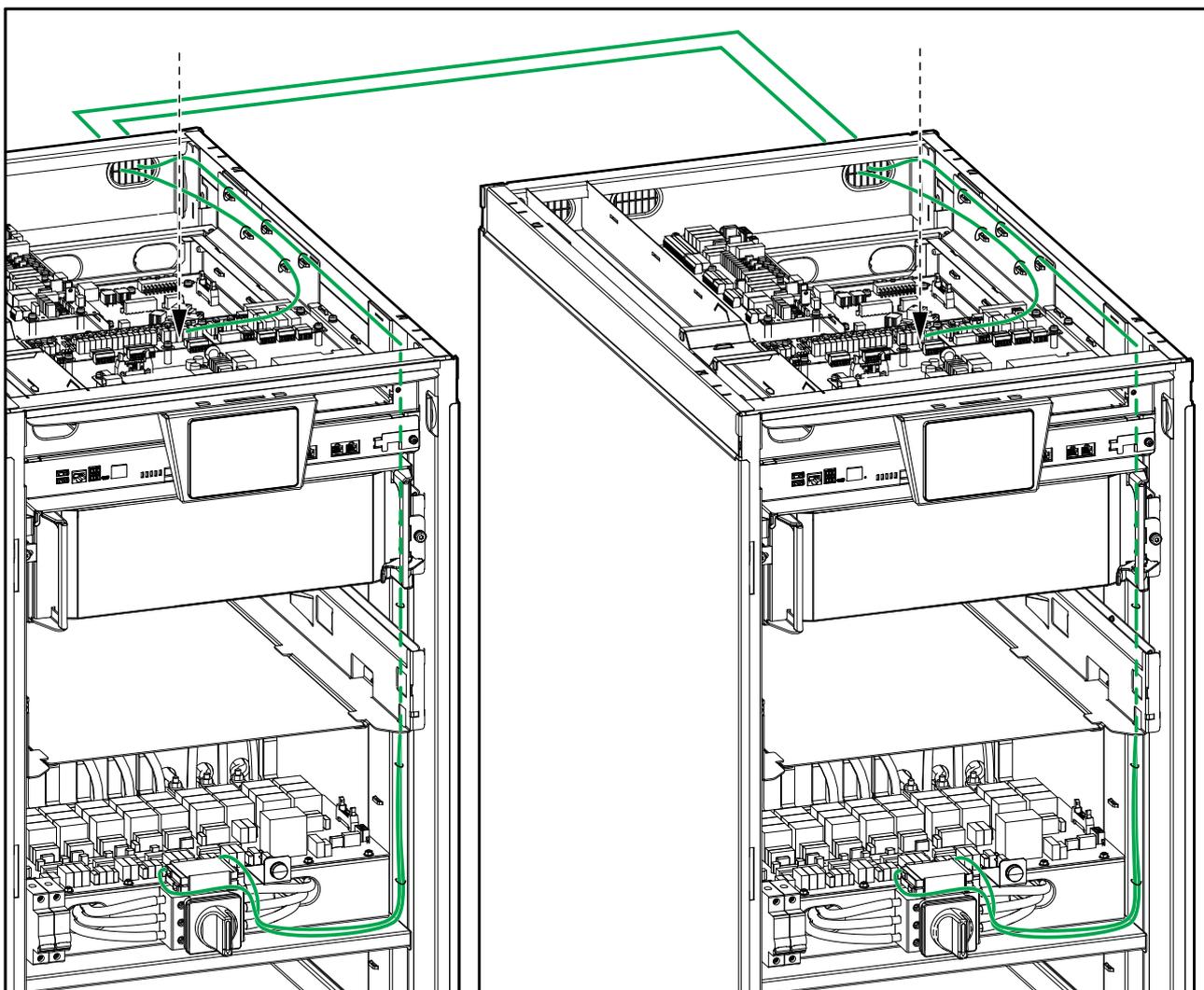
2. Install an additional AUX switch (provided) on the internal maintenance breaker IMB on both UPSs.



3. Connect the non-Class 2/non-SELV signal cables between the two UPSs:
 - a. Connect the non-Class 2/non-SELV signal cables (not provided) from the AUX switch terminal 21 and 22 in the internal maintenance breaker IMB in UPS 1 to J6614-5 and J6614-6 on board 640-4843 in UPS 2 as shown.
 - b. Connect the non-Class 2/non-SELV signal cables (not provided) from the AUX switch terminal 21 and 22 in the internal maintenance breaker IMB in UPS 2 to J6614-5 and J6614-6 on board 640-4843 in UPS 1 as shown.



Front View of Simplified 1+1 Parallel System

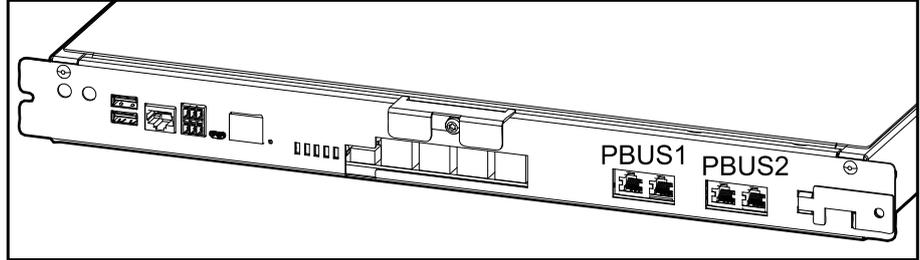


4. Reinstall the front cover and the static switch module on both UPSs.

Connect the PBUS Cables

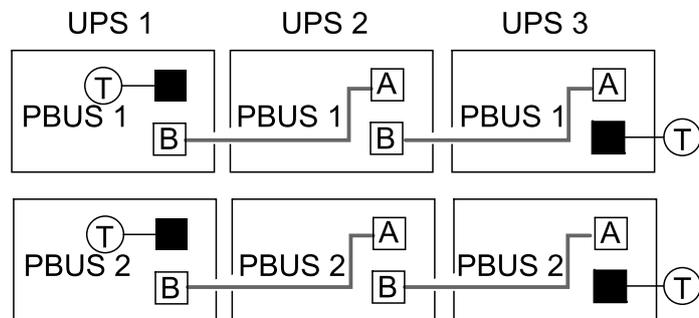
1. Connect the provided PBUS 1 (white) and PBUS 2 (red) cables to the PBUS ports in the UPS controller boxes. Route the PBUS cables through the cable channel in the UPSs.

Front View of Controller Box



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

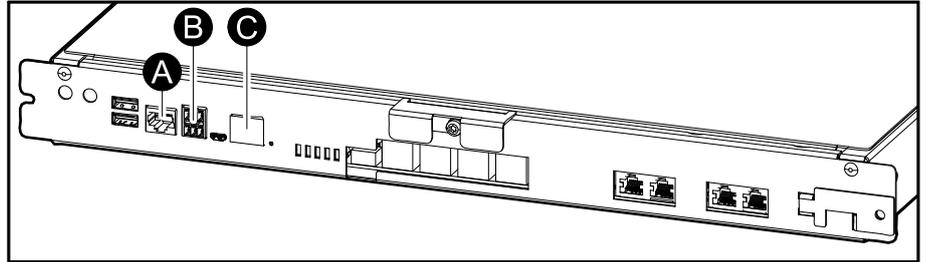
Example of System with Three UPSs in Parallel



Connect the External Communication Cables

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

Front View of the Controller Box



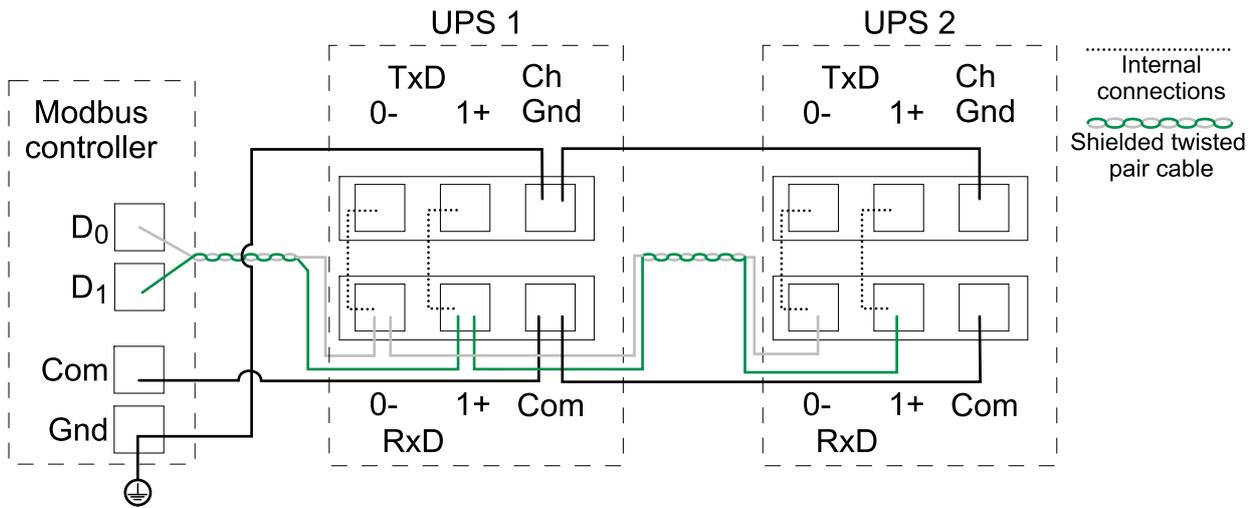
- A. Universal I/O port for built-in network management card.
- B. Modbus port for built-in network management card. See *Connect the Modbus Cables*, page 56.
- C. Network port for built-in network management card. Use a shielded network cable.

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

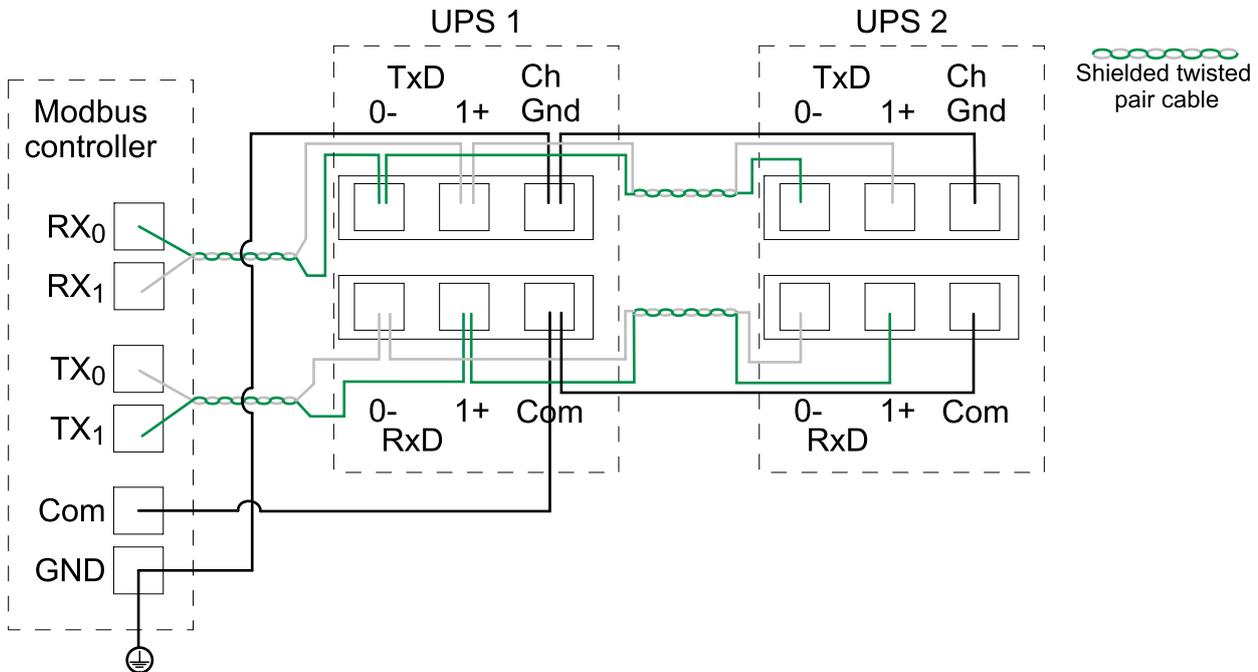
Connect the Modbus Cables

- Connect the Modbus cables to the UPS(s). Use either 2-wire or 4-wire connection. Shield the cables as shown.
 - 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 shield must be connected to 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 optically isolated. The ground of the Modbus port is not connected to any other ground.

Example: 2-Wire Connection with Two UPSs



Example: 4-Wire Connection with Two UPSs



- 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.

3. Install 400–650 Ohm bias resistors at or inside the system controller; one from D0 to ground and one from D1 to +5 VDC.

Add Translated Safety Labels to Your Product

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

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

Final Installation

⚡⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠ WARNING

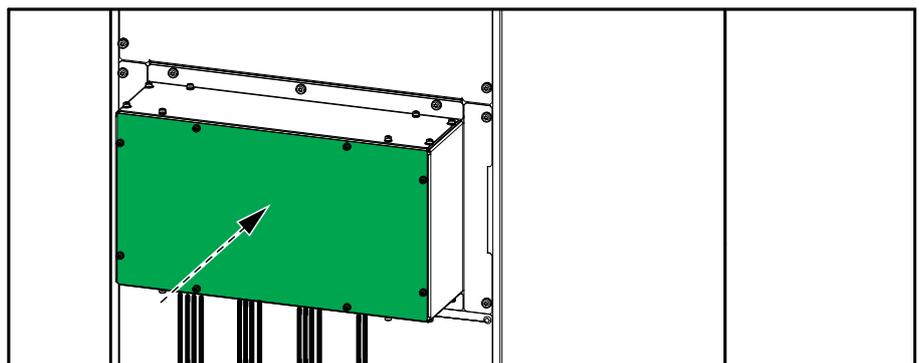
RISK OF EQUIPMENT DAMAGE

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

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

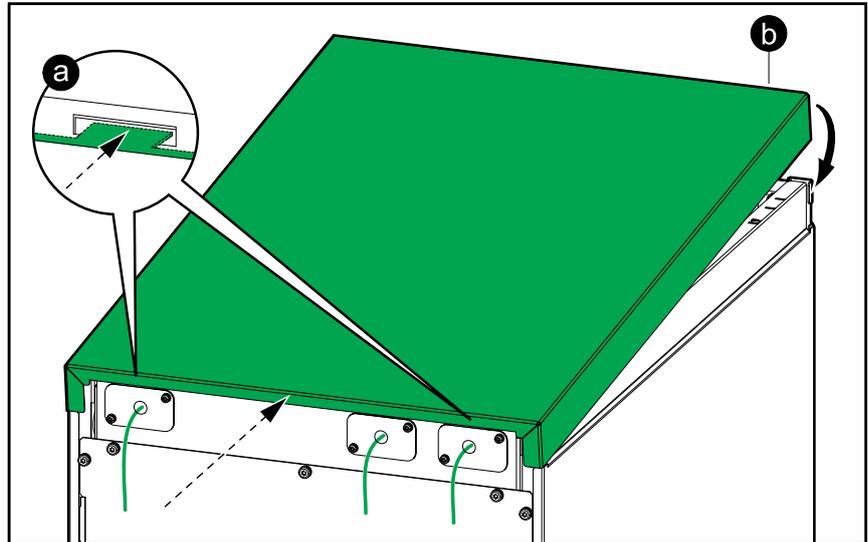
1. Reinstall the rear plate on the conduit box.

Rear View of UPS

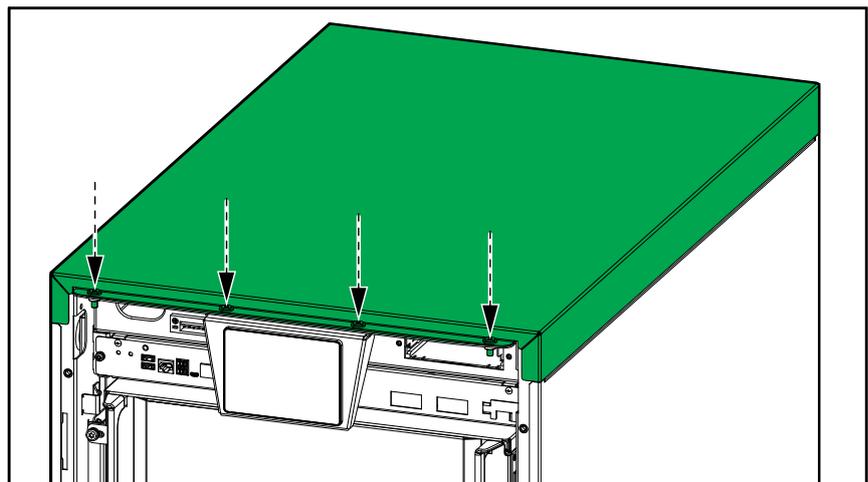


2. Reinstall the top cover:
 - a. Tilt the top cover and slide it onto the UPS from the rear. Taps in the rear of the top cover must connect to the slots in the rear of the UPS.
 - b. Push the top cover down in the front.

Rear View of the UPS

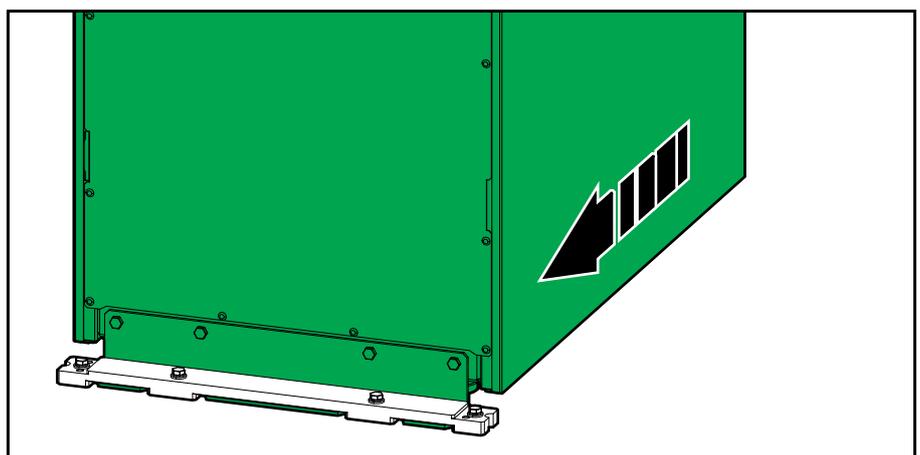


- c. Reinstall the screws.

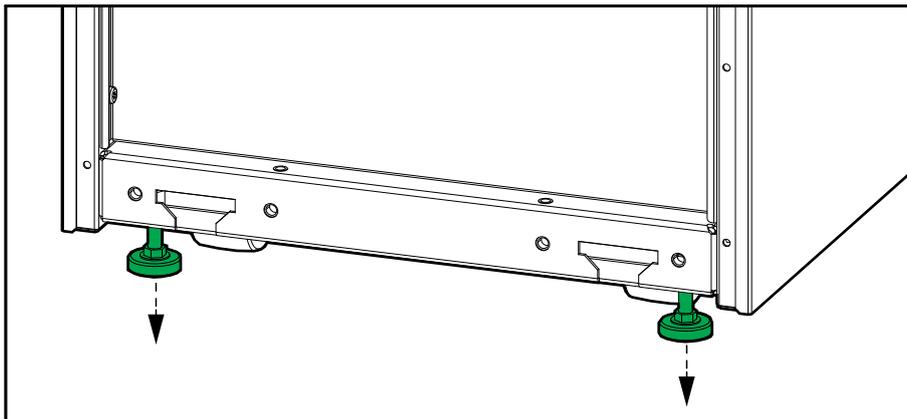


3. **Only for seismic anchoring:** Push the UPS into position so the rear anchoring bracket connects to the rear anchor.

Rear View of the UPS



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



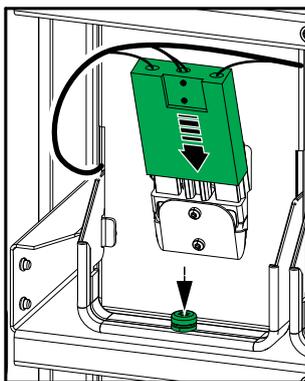
NOTICE

RISK OF EQUIPMENT DAMAGE

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

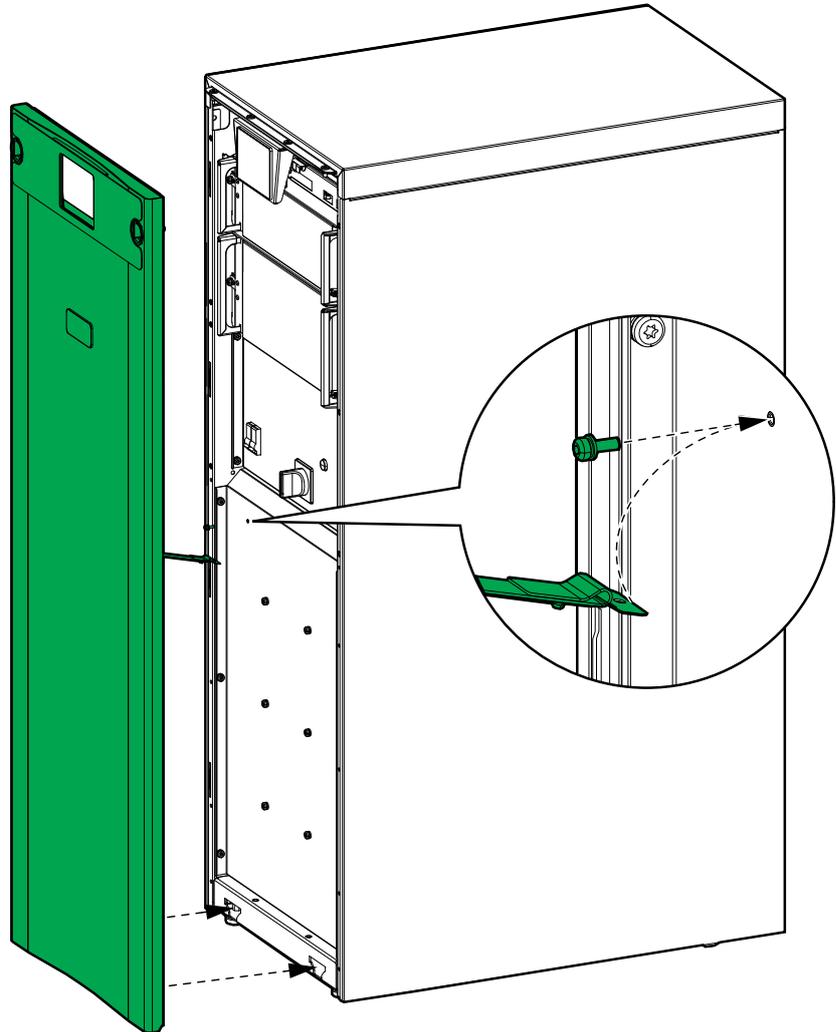
Failure to follow these instructions can result in equipment damage.

5. **Only for seismic anchoring:** Mount the seismic front anchoring bracket on the UPS to the floor. Use appropriate hardware for the floor type – the hole diameter in the front anchoring bracket is $\varnothing 18$ mm.
6. Set the battery breaker BB to the open (OFF) position.
7. Push extra battery modules (if any) into the slot. Fill the shelves from the bottom and upwards.
8. Turn down the battery module handle on the extra battery modules and fasten the handle to the shelf with the provided screw.
9. Connect the battery terminals to the front of the battery modules.



10. Reinstall the battery cover on the UPS.

11. Reinstall the front panel on the UPS:
 - a. Insert the two taps in the bottom of the front panel in the UPS at a tilted angle.
 - b. Reconnect the front panel strap to the UPS.
 - c. Close the front panel and lock with the two locking knobs.



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.

© 2019 – 2019 Schneider Electric. All rights reserved.

990-91261B-001