Easy UPS 3S Pro for Internal Batteries

10-40 kVA 400 V 3:3 / 10-30 kVA 400 V 3:1

Installation

Latest updates are available on the Schneider Electric website
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www.se.com

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Important Safety Instructions — SAVE THESE INSTRUCTIONS

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

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

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

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

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

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

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

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

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

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Per IEC 62040-1: "Uninterruptible power systems (UPS) -- Part 1: Safety Requirements," this equipment, including battery access, must be inspected, installed and maintained by a skilled person.

The skilled person is a person with relevant education and experience to enable him or her to perceive risks and to avoid hazards which the equipment can create (reference IEC 62040-1, section 3.102).

Electromagnetic Compatibility

NOTICE

RISK OF ELECTROMAGNETIC DISTURBANCE

This is a product category C3 product. In a residential environment, this product may cause radio inference, in which case the user may be required to take additional measures.

Failure to follow these instructions can result in equipment damage.

Safety Precautions

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read all instructions in the Installation Manual before installing or working on this UPS system.

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install the UPS system until all construction work has been completed and the installation room has been cleaned.

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

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The product must be installed according to the specifications and requirements as defined by Schneider Electric. It concerns in particular the external and internal protections (upstream 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.

⚠ 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.

⚠DANGER

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.

NOTICE

RISK OF OVERHEATING

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

Failure to follow these instructions can result in equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

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

Failure to follow these instructions can result in equipment damage.

Additional Safety Precautions After Installation

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

Electrical Safety

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

Battery Safety

⚠⚠DANGER

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.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

⚠CAUTION

RISK OF EQUIPMENT DAMAGE

- Mount the batteries in the UPS system, but do not connect the batteries until the UPS system is ready to be powered up. The time duration from battery connection until the UPS system is powered up must not exceed 72 hours or 3 days.
- Batteries must not be stored more than six months due to the requirement of recharging. If the UPS system remains de-energized for a long period, we recommend that you energize the UPS system for a period of 24 hours at least once every month. This charges the batteries, thus avoiding irreversible damage.

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

NOTE: Always follow the documentation from the battery manufacturer concerning battery storage, battery installation, and battery maintenance.

Cybersecurity Recommendations

- Install the UPS in a location with restricted access.
- Only authorize access to the UPS to maintenance and service personnel.
- Mark the restricted areas with “For authorized personnel only”.
- Record the access to restricted areas with either a physical or an electronic audit trail.

Symbols Used in the Product

	This is the earthing/ground symbol.
	This is the protective earth/equipment grounding conductor symbol.
	This is the direct current symbol. It is also referred to as DC.
	This is the alternating current symbol. It is also referred to as AC.
	This is the positive polarity symbol. It is used to identify the positive terminal(s) of equipment which is used with, or generates direct current.
	This is the negative polarity symbol. It is used to identify the negative terminal(s) of equipment which is used with, or generates direct current.
	This is the battery symbol.
	This is the static switch symbol. It is used to indicate switches that are designed to connect or disconnect the load to or from the supply respectively without the existence of moving parts.
	This is the AC/DC converter (rectifier) symbol. It is used to identify an AC/DC converter (rectifier) and, in case of plug-in devices, to identify the relevant receptacles.
	This is the DC/AC converter (inverter) symbol. It is used to identify an DC/AC converter (inverter) and, in case of plug-in devices, to identify the relevant receptacles.

Specifications

3:3 UPS Specifications

Specifications for 10 kVA 3:3 UPS

	Voltage (V)	380	400	415
Input	Connections	4-wire (L1, L2, L3, N, PE)(1)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	16	16	15
	Maximum input current (A)	21	20	19
	Input current limitation (A)	21	20	19
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	4-wire (L1, L2, L3, N, PE)(1)		
	Bypass voltage range (V)	342-418	360-440	373-457
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	16	15	15
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(1) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	380	400	415
Output	Connections[2]	4-wire (L1, L2, L3, N, PE)[3]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	16	15	14
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45.		
	Output short circuit current (inverter) (A)[4]	34		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% balanced linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 30% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	2		
	Maximum charging power (kW) (at ≤ 85% load)	3		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	5.5		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[5]		
	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)	22		
	Battery current at full load and minimum battery voltage (A)	27		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(2) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(3) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(4) The output short circuit current (inverter) is based on IK1 at 10 ms.
(5) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 15 kVA 3:3 UPS

	Voltage (V)	380	400	415
Input	Connections	4-wire (L1, L2, L3, N, PE)(6)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	24	23	22
	Maximum input current (A)	31	29	28
	Input current limitation (A)	31	29	28
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	4-wire (L1, L2, L3, N, PE)(6)		
	Bypass voltage range (V)	342-418	360-440	373-457
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	24	22	22
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(6) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	380	400	415
Output	Connections[7]	4-wire (L1, L2, L3, N, PE)[8]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	23	22	21
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45.		
	Output short circuit current (inverter) (A)[9]	52		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% balanced linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 26% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	3		
	Maximum charging power (kW) (at ≤ 85% load)	3.9		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	7.2		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[10]		
	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)	33		
	Battery current at full load and minimum battery voltage (A)	41		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(7) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(8) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(9) The output short circuit current (inverter) is based on IK1 at 10 ms.
(10) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 20 kVA 3:3 UPS

	Voltage (V)	380	400	415
Input	Connections	4-wire (L1, L2, L3, N, PE)(11)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	32	31	29
	Maximum input current (A)	41	39	38
	Input current limitation (A)	41	39	38
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	4-wire (L1, L2, L3, N, PE)(11)		
	Bypass voltage range (V)	342-418	360-440	373-457
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	31	30	29
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(11) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	380	400	415
Output	Connections[12]	4-wire (L1, L2, L3, N, PE)[13]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	31	29	28
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45.		
	Output short circuit current (inverter) (A)[14]	74		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% balanced linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 20% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	4		
	Maximum charging power (kW) (at 0% load)	4		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	7.4		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[15]		
	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)	44		
	Battery current at full load and minimum battery voltage (A)	55		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(12) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(13) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(14) The output short circuit current (inverter) is based on IK1 at 10 ms.
(15) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 30 kVA 3:3 UPS

	Voltage (V)	380	400	415
Input	Connections	4-wire (L1, L2, L3, N, PE)(16)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	48	46	44
	Maximum input current (A)	60	57	55
	Input current limitation (A)	60	57	55
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	4-wire (L1, L2, L3, N, PE)(16)		
	Bypass voltage range (V)	342-418	360-440	373-457
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	47	44	43
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(16) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	380	400	415
Output	Connections[17]	4-wire (L1, L2, L3, N, PE)[18]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	46	44	42
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45.		
	Output short circuit current (inverter) (A)[19]	104		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% balanced linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 26% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	6		
	Maximum charging power (kW) (at ≤ 85% load)	7.8		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	14.4		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[20]		
	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)	65		
	Battery current at full load and minimum battery voltage (A)	82		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(17) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(18) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(19) The output short circuit current (inverter) is based on IK1 at 10 ms.
(20) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 40 kVA 3:3 UPS

	Voltage (V)	380	400	415
Input	Connections	4-wire (L1, L2, L3, N, PE)(21)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	64	61	58
	Maximum input current (A)	81	77	74
	Input current limitation (A)	81	77	74
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	4-wire (L1, L2, L3, N, PE)(21)		
	Bypass voltage range (V)	342-418	360-440	373-457
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	62	59	57
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(21) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	380	400	415
Output	Connections[22]	4-wire (L1, L2, L3, N, PE)[23]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	61	58	56
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45.		
	Output short circuit current (inverter) (A)[24]	140		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% balanced linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 20% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	8		
	Maximum charging power (kW) (at 0% load)	8		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	14.8		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[25]		
	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)	87		
	Battery current at full load and minimum battery voltage (A)	109		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(22) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(23) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(24) The output short circuit current (inverter) is based on IK1 at 10 ms.
(25) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

3:1 UPS Specifications

Specifications for 10 kVA 3:1 UPS

	Voltage (V)	220 V	230 V	240 V
Input	Connections	4-wire (L1, L2, L3, N, PE)(26)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	16	16	15
	Maximum input current (A)	21	20	19
	Input current limitation (A)	21	20	19
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	2-wire (L, N, PE)(26)		
	Bypass voltage range (V)	198-242	207-253	216-264
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	47	45	43
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		

(26) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.

	Voltage (V)	220 V	230 V	240 V
Output	Connections[27]	2-wire (L, N, PE)[28]		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	46	44	42
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45..		
	Output short circuit current (inverter) (A)[29]	34		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 30% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	2		
	Maximum charging power (kW) (at ≤ 85% load)	3		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	5.5		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C[30]		
	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)	22		
	Battery current at full load and minimum battery voltage (A)	27		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

NOTE: Battery specifications are based on VRLA batteries.

(27) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(28) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(29) The output short circuit current (inverter) is based on IK1 at 10 ms.
(30) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 15 kVA 3:1 UPS

	Voltage (V)	220 V	230 V	240 V
Input	Connections	4-wire (L1, L2, L3, N, PE)(31)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	24	23	22
	Maximum input current (A)	31	29	28
	Input current limitation (A)	31	29	28
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	2-wire (L, N, PE)(31)		
	Bypass voltage range (V)	198-242	207-253	216-264
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	70	67	64
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		
Output	Connections(32)	2-wire (L, N, PE)(31)		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	69	65	63
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45..		
	Output short circuit current (inverter) (A)(33)	52		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		

(31) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(32) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(33) The output short circuit current (inverter) is based on IK1 at 10 ms.

	Voltage (V)	**220 V**	**230 V**	**240 V**
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 26% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	3		
	Maximum charging power (kW) (at ≤ 85% load)	3.9		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	7.2		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C(34)		
	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)	33		
	Battery current at full load and minimum battery voltage (A)	41		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

(34) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 20 kVA 3:1 UPS

	Voltage (V)	220 V	230 V	240 V
Input	Connections	4-wire (L1, L2, L3, N, PE)(35)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	32	31	29
	Maximum input current (A)	41	39	38
	Input current limitation (A)	41	39	38
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	2-wire (L, N, PE)(35)		
	Bypass voltage range (V)	198-242	207-253	216-264
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	94	89	86
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		
Output	Connections(36)	2-wire (L, N, PE)(35)		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	92	87	84
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45..		
	Output short circuit current (inverter) (A)(37)	74		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		

(35) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(36) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(37) The output short circuit current (inverter) is based on IK1 at 10 ms.

	Voltage (V)	220 V	230 V	240 V
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 20% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	4		
	Maximum charging power (kW) (at 0% load)	4		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	7.4		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C(38)		
	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)	44		
	Battery current at full load and minimum battery voltage (A)	55		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

(38) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Specifications for 30 kVA 3:1 UPS

	Voltage (V)	220 V	230 V	240 V
Input	Connections	4-wire (L1, L2, L3, N, PE)(39)		
	Input voltage range (V)	304-477	320-477	332-477
	Frequency range (Hz)	40-70		
	Nominal input current (A)	48	46	44
	Maximum input current (A)	60	57	55
	Input current limitation (A)	60	57	55
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Total harmonic distortion (THDI)	< 3% at full linear load < 4% (full non-linear load)		
	Input power factor	0.99 at load > 75%		
	Protection	Built-in backfeed circuit breaker and fuses		
Bypass	Connections	2-wire (L, N, PE)(39)		
	Bypass voltage range (V)	198-242	207-253	216-264
	Frequency (Hz)	50 or 60		
	Frequency range (Hz)	Selectable, ±1, ±3, ±5		
	Nominal bypass current (A)	140	133	128
	Minimum short circuit rating	Dependent on upstream protection. See Upstream and Downstream Protection, page 33 for details.		
	Maximum short circuit rating	Icc = 16 kA		
	Backfeed protection	Dry contact (with 24 VDC source)		
Output	Connections(40)	2-wire (L, N, PE)(39)		
	Output voltage regulation	Symmetrical load ± 1% Asymmetrical load ± 3%		
	Overload capacity	Normal operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Battery operation: 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute Bypass operation: 150% for 1 minute, 125% for 10 minutes, 110% continuous		
	Output power factor	1		
	Nominal output current (A)	137	130	126
	Maximum short circuit rating	Icc = 16 kA		
	Inverter output short circuit capabilities	Varies with time. See graph and table values in Inverter Short Circuit Capabilities (Bypass not Available), page 45..		
	Output short circuit current (inverter) (A)(41)	104		
	Output frequency (Hz)	50/60 Hz bypass synchronized; 50/60 Hz ±0.1% free running		
	Synchronized slew rate (Hz/sec)	Programmable: 0.5, 1.0, 1.5, or 2.0. Default is 2.0.		
	Total harmonic distortion (THDU)	<1% for 100% linear load <5% for non-linear load		
	Output voltage compensation	± 10 V		

(39) Refer to the earthing diagrams for your specific earthing system requirements concerning the N connection.
(40) The number of output connections must match the number of input connections in a single mains system. The number of output connections must match the number of bypass connections in a dual mains system.
(41) The output short circuit current (inverter) is based on IK1 at 10 ms.

	Voltage (V)	220 V	230 V	240 V
	Output performance classification (according to IEC/ EN62040-3)	VFI SS 11		
	Load crest factor	Maximum crest factor 3:1		
	Load power factor	From 0.7 leading to 0.7 lagging without any derating		
Battery	Charging power in % of output power	Programmable from 1% to 26% of UPS capacity. Default is 10%.		
	Maximum charging power (kW) (at 100% load)	6		
	Maximum charging power (kW) (at ≤ 85% load)	7.6		
	Number of battery blocks	40 blocks with middle point		
	Nominal battery voltage (VDC)	480		
	Nominal float voltage (VDC)	545		
	Maximum boost voltage (VDC)	572		
	Maximum charge current (A)	14.4		
	Temperature compensation (per cell)	0 – 5 mV/°C for 15 °C ≤ T ≤ 25 °C -5 – 0 mV/°C for 25 °C ≤ T ≤ 35 °C(42)		
	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)	65		
	Battery current at full load and minimum battery voltage (A)	82		
	Ripple current	< 5% C10		
	Battery test	Manual/automatic (selectable)		
	Maximum short circuit rating	Icc = 16 kA		

(42) If the temperature is lower than 15 °C, the temperature compensation is the same as that at 15 °C; if the temperature is higher than 35 °C, the temperature compensation is the same as that at 35 °C.

Upstream and Downstream Protection

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

NOTE: For local directives which require 4-pole circuit breakers: Refer to the earthing diagrams for details about neutral connection.

The bypass/output disconnect devices are sized based on the nominal current +10%. This is to accommodate either low grid voltage or deviation in length between parallel UPSs.

Required Upstream Protection for 380/400/415 V (IEC) and Minimum Prospective Phase-To-Earth Short Circuit at the UPS Input/Bypass Terminals

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The upstream overcurrent protective device (and its settings) must be sized to ensure a disconnecting time within 0.07 seconds in case of a short circuit between the input/bypass phase and the UPS.

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

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

Required 3-Pole Upstream Protection for 3:3 UPS

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	**10 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Circuit breaker type	NSX100B TM25D 3P3D, C10B3TM025			NSX100B TM25D 3P3D, C10B3TM025		
In	25	25	25	25	25	25
Ir	0.8 x In	0.8 x In	0.8 x In	0.7 x In	0.7 x In	0.7 x In
Im	300	300	300	300	300	300

UPS rating	**15 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Circuit breaker type	NSX100B NSX TM32D 3P3D, C10B3TM032			NSX100B TM32D 3P3D, C10B3TM032		
In	32	32	32	32	32	32
Ir	In	In	In	0.9 x In	0.8 x In	0.8 x In
Im	400	400	400	400	400	400

UPS rating	20 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM40D 3P3D, C10B3TM040			NSX100B TM40D 3P3D, C10B3TM040		
In	40	40	40	40	40	40
Ir	In	In	In	0.9 x In	0.9 x In	0.8 x In
Im	500	500	500	500	500	500

UPS rating	30 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM63D 3P3D, C10B3TM063			NSX100B TM63D 3P3D, C10B3TM063		
In	63	63	63	63	63	63
Ir	In	In	In	0.9 x In	0.8 x In	0.8 x In
Im	500	500	500	500	500	500

UPS rating	40 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM63D 3P3D, C10B3TM080			NSX100B TM63D 3P3D, C10B3TM080		
In	80	80	80	80	80	80
Ir	In	In	In	0.9 x In	0.9 x In	0.8 x In
Im	640	640	640	640	640	640

Required 4-Pole Upstream Protection for 3:3 UPS

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	10 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM25D 4P3D, C10B6TM025			NSX100B TM25D 4P3D, C10B6TM025		
In	25	25	25	25	25	25
Ir	0.8 x In	0.8 x In	0.8 x In	0.7 x In	0.7 x In	0.7 x In
Im	300	300	300	300	300	300

UPS rating	15 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM40D 4P3D, C10B6TM040			NSX100B TM40D 4P3D, C10B6TM040		
In	40	40	40	40	40	40
Ir	0.8 x In	0.8 x In	0.8 x In	0.7 x In	0.7 x In	0.7 x In
Im	500	500	500	500	500	500

UPS rating	20 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM63D 4P3D, C10B6TM063			NSX100B TM63D 4P3D, C10B6TM063		
In	63	63	63	63	63	63
Ir	0.7 x In	0.7 x In	0.7 x In	0.7 x In	0.7 x In	0.7 x In
Im	500	500	500	500	500	500

UPS rating	30 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM80D 4P3D, C10B6TM080			NSX100B TM80D 4P3D, C10B6TM080		
In	80	80	80	80	80	80
Ir	0.8 x In	0.8 x In	0.8 x In	0.7 x In	0.7 x In	0.7 x In
Im	640	640	640	640	640	640

UPS rating	40 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	380	400	415
Circuit breaker type	NSX100B TM100D 4P3D, C10B6TM100			NSX100B TM100D 4P3D, C10B6TM100		
In	100	100	100	100	100	100
Ir	0.8 x In	0.8 x In	0.8 x In	0.7 x In	0.7 x In	0.7 x In
Im	800	800	800	800	800	800

Required 3-Pole Upstream Protection for 3:1 UPS – Single Mains

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	10 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM63D 3P3D, C10B3TM063			NSX100B TM63D 2P2D, C10M2TM063		
In	63	63	63	63	63	63
Ir	In	In	In	63 fixed	63 fixed	63 fixed
Im	500	500	500	500	500	500

UPS rating	15 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM80D,3P3D, C10B3TM080			NSX100B TM80D 2P2D, C10M2TM080		
In	80	80	80	80	80	80
Ir	In	In	In	80 fixed	80 fixed	80 fixed
Im	640	640	640	640	640	640

UPS rating	20 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM100D,3P3D, C10B3TM100			NSX100B TM100D 2P2D, C10M2TM100		
In	100	100	100	100	100	100
Ir	In	In	In	100 fixed	100 fixed	100 fixed
Im	800	800	800	800	800	800

UPS rating	30 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX160B TM160D,3P3D, C16B3TM160			NSX160B TM160D 2P2D, C16M2TM160		
In	160	160	160	160	160	160
Ir	In	In	In	160 fixed	160 fixed	160 fixed
Im	1250	1250	1250	1250	1250	1250

Required 3-Pole Upstream Protection for 3:1 UPS – Dual Mains

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	10 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM25D 3P3D, C10B3TM025			NSX100B TM63D 2P2D, C10M2TM063		
In	25	25	25	63	63	63
Ir	0.8 × In	0.8 × In	0.8 × In	63 fixed	63 fixed	63 fixed
Im	300	300	300	500	500	500

UPS rating	15 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B NSX TM32D 3P3D, C10B3TM032			NSX100B TM80D 2P2D, C10M2TM080		
In	32	32	32	80	80	80
Ir	In	In	In	80 fixed	80 fixed	80 fixed
Im	400	400	400	640	640	640

UPS rating	20 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM40D 3P3D, C10B3TM040			NSX100B TM100D 2P2D, C10M2TM100		
In	40	40	40	100	100	100
Ir	In	In	In	100 fixed	100 fixed	100 fixed
Im	500	500	500	800	800	800

UPS rating	30 kVA					
	Input			Bypass/Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM63D 3P3D, C10B3TM063			NSX160B TM160D 2P2D, C16M2TM160		
In	63	63	63	160	160	160
Ir	In	In	In	160 fixed	160 fixed	160 fixed
Im	500	500	500	1250	1250	1250

Required 4-Pole Upstream Protection for 3:1 UPS – Single Mains

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	10 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM63D 4P3D, C10B6TM063			NSX100B TM63D 2P2D, C10M2TM063		
In	63	63	63	63	63	63
Ir	In	In	In	63 fixed	63 fixed	63 fixed
Im	500	500	500	500	500	500

UPS rating	15 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM80D,4P3D, C10B6TM080			NSX100B TM80D 2P2D, C10M2TM080		
In	80	80	80	80	80	80
Ir	In	In	In	80 fixed	80 fixed	80 fixed
Im	640	640	640	640	640	640

UPS rating	20 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX100B TM100D,4P3D, C10B6TM100			NSX100B TM100D 2P2D, C10M2TM100		
In	100	100	100	100	100	100
Ir	In	In	In	100 fixed	100 fixed	100 fixed
Im	800	800	800	800	800	800

UPS rating	30 kVA					
	Input/Bypass			Output		
Voltage (V)	380	400	415	220	230	240
Circuit breaker type	NSX160B TM160D,4P3D, C16B3TM160			NSX160B TM160D 2P2D, C16M2TM160		
In	160	160	160	160	160	160
Ir	In	In	In	160 fixed	160 fixed	160 fixed
Im	1250	1250	1250	1250	1250	1250

Required 4-Pole Upstream Protection for 3:1 UPS – Dual Mains

NOTE: Ir must be set on the circuit breakers during start-up.

UPS rating	**10 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**220**	**230**	**240**
Circuit breaker type	NSX100B TM25D 4P3D, C10B6TM025			NSX100B TM63D 2P2D, C10M2TM063		
In	25	25	25	63	63	63
Ir	0.8 × In	0.8 × In	0.8 × In	63 fixed	63 fixed	63 fixed
Im	300	300	300	500	500	500

UPS rating	**15 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**220**	**230**	**240**
Circuit breaker type	NSX100B NSX TM40D 4P3D, C10B6TM040			NSX100B TM80D 2P2D, C10M2TM080		
In	40	40	40	80	80	80
Ir	0.8 × In	0.8 × In	0.8 × In	80 fixed	80 fixed	80 fixed
Im	500	500	500	640	640	640

UPS rating	**20 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**220**	**230**	**240**
Circuit breaker type	NSX100B TM63D 4P3D, C10B6TM063			NSX100B TM100D 2P2D, C10M2TM100		
In	63	63	63	100	100	100
Ir	0.7 × In	0.7 × In	0.7 × In	100 fixed	100 fixed	100 fixed
Im	500	500	500	800	800	800

UPS rating	**30 kVA**					
	Input			**Bypass/Output**		
Voltage (V)	**380**	**400**	**415**	**220**	**230**	**240**
Circuit breaker type	NSX100B TM80D 4P3D, C10B6TM080			NSX160B TM160D 2P2D, C16M2TM160		
In	80	80	80	160	160	160
Ir	0.8 × In	0.8 × In	0.8 × In	160 fixed	160 fixed	160 fixed
Im	640	640	640	1250	1250	1250

Recommended Downstream Protection for 380/400/415 V (IEC) for 3:3 UPS

UPS rating	**Circuit breaker type**
10 kVA	IC65H-4P-B 4A
15 kVA	IC65H-4P-B 6A
20 kVA	IC65H-4P-C 6A
30 kVA	IC65H-4P-C 6A
40 kVA	IC65H-4P-B 10A

Recommended Downstream Protection for 380/400/415 V (IEC) for 3:1 UPS

UPS rating	Circuit breaker type
10 kVA	IC65H-2P-B 10A
15 kVA	IC65H-2P-B 16A
20 kVA	IC65H-2P-B 20A
30 kVA	IC65H-2P-B 32A

Recommended Cable Sizes

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- All wiring must comply with all applicable national and/or electrical codes.
- The maximum allowable cable size for 3:3 UPS is 25 mm^2 (10-30 kVA UPS) or 35 mm^2 (40 kVA UPS).
- The maximum allowable cable size for 3:1 UPS is 25 mm^2 (10-15 kVA UPS), 35 mm^2 (20 kVA UPS), or 50 mm^2 (30 kVA UPS).
- Shrink sleeves must be fitted over the 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.

NOTE: Overcurrent protection is to be provided by others.

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

- 90 °C conductors
- An ambient temperature of 30 °C
- Use of copper conductors
- PE cable size is based on table 54.2 of IEC 60364-5-54
- Installation method C
- Specific to AC cables: Maximum length 70 m with a line voltage drop <3% installed on perforated cable trays, XLPE-type insulation, single layer trefoil formation, THDI between 15% and 33%.
- Specific to DC cables: Maximum length 15 m with a line voltage drop <1%

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

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

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

Copper for 3:3 UPS

UPS rating	**10 kVA**			**15 kVA**			**20 kVA**		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	6	6	6	6	6	6	10	10	10
Input PE (mm^2)	6	6	6	6	6	6	10	10	10
Bypass/output phases (mm^2)	6	6	6	6	6	6	10	10	10
Bypass PE/output PE (mm^2)	6	6	6	6	6	6	10	10	10
Neutral (mm^2)	6	6	6	6	6	6	16	16	16
DC+/DC-/DC N (mm^2)	6	6	6	6	6	6	16	16	16
DC PE (mm^2)	6	6	6	6	6	6	16	16	16

Copper for 3:3 UPS

UPS rating	30 kVA			40 kVA		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	16	16	16	25	25	25
Input PE (mm^2)	16	16	16	16	16	16
Bypass/output phases (mm^2)	16	16	16	25	25	25
Bypass PE/output PE (mm^2)	16	16	16	16	16	16
Neutral (mm^2)	25	25	25	35	35	35
DC+/DC-/DC N (mm^2)	25	25	25	35	35	35
DC PE (mm^2)	16	16	16	16	16	16

Copper for 3:1 UPS – Single Mains

UPS rating	10 kVA			15 kVA		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	16	16	16	25	25	25
Input neutral (mm^2)	16	16	16	25	25	25
Input PE (mm^2)	16	16	16	16	16	16
Bypass/output phases (mm^2)	16	16	16	25	25	25
Bypass/output neutral (mm^2)	16	16	16	25	25	25
Bypass PE/output PE (mm^2)	16	16	16	16	16	16
DC+/DC-/DC N (mm^2)	6	6	6	6	6	6
DC PE (mm^2)	6	6	6	6	6	6

Copper for 3:1 UPS – Single Mains

UPS rating	20 kVA			30 kVA		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	35	35	35	50	50	50
Input neutral (mm^2)	35	35	35	50	50	50
Input PE (mm^2)	16	16	16	25	25	25
Bypass/output phases (mm^2)	35	35	35	50	50	50
Bypass/output neutral (mm^2)	35	35	35	50	50	50
Bypass PE/output PE (mm^2)	16	16	16	25	25	25
DC+/DC-/DC N (mm^2)	16	16	16	25	25	25
DC PE (mm^2)	16	16	16	16	16	16

Copper for 3:1 UPS – Dual Mains

UPS rating	10 kVA			15 kVA		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	6	6	6	6	6	6
Input neutral (mm^2)	6	6	6	6	6	6
Input PE (mm^2)	6	6	6	6	6	6
Bypass/output phases (mm^2)	16	16	16	25	25	25
Bypass/output neutral (mm^2)	16	16	16	25	25	25
Bypass PE/output PE (mm^2)	16	16	16	16	16	16
DC+/DC-/DC N (mm^2)	6	6	6	6	6	6
DC PE (mm^2)	6	6	6	6	6	6

Copper for 3:1 UPS – Dual Mains

UPS rating	20 kVA			30 kVA		
Voltage (V)	**380**	**400**	**415**	**380**	**400**	**415**
Input phases (mm^2)	10	10	10	16	16	16
Input neutral (mm^2)	10	10	10	16	16	16
Input PE (mm^2)	10	10	10	16	16	16
Bypass/output phases (mm^2)	35	35	35	50	50	50
Bypass/output neutral (mm^2)	35	35	35	50	50	50
Bypass PE/output PE (mm^2)	16	16	16	25	25	25
DC+/DC-/DC N (mm^2)	16	16	16	25	25	25
DC PE (mm^2)	16	16	16	16	16	16

Load Sharing in Bypass Operation in a Parallel System

NOTICE

RISK OF EQUIPMENT DAMAGE

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

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

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

Failure to follow these instructions can result in equipment damage.

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

Recommended Bolt and Lug Sizes

3:3 UPS

Cable size mm²	Bolt size	Cable lug type
6	M6	KST TLK6-6
10	M6	KST TLK10-6
16	M6	KST TLK16-6
16	M8	KST TLK16-8
25	M6	KST DRNB6-25
25	M8	KST TLK25-8
35	M8	KST TLK35-8

3:1 UPS

Cable size mm²	Bolt size	Cable lug type
6	M6	KST TLK6-6
10	M6	KST TLK10-6
16	M6	KST TLK16-6
16	M8	KST TLK16-8
25	M6	KST DRNB6-25
25	M8	KST TLK25-8
35	M6	KST TLK35-6
50	M8	KST TLK50-8

Torque Specifications

Bolt size	Torque
M5	4 Nm
M6	5 Nm
M8	12 Nm

Inverter Short Circuit Capabilities (Bypass not Available)

IK1 – Short Circuit between a Phase and Neutral for 3:3 UPS

IK1 400 V

S [kVA]	10 ms		20 ms		30 ms	
	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]
10	34	12	34	23	34	35
15	52	27	52	54	52	81
20	74	55	74	110	74	164
30	104	108	104	216	104	324
40	140	196	140	392	140	588

IK1 400 V

S [kVA]	50 ms		100 ms		200 ms	
	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]
10	34	58	34	116	34	231
15	52	135	52	270	52	541
20	74	274	74	548	74	1095
30	104	541	104	1082	104	2163
40	140	980	140	1960	140	3920

IK2 – Short Circuit between Two Phases for 3:3 UPS

IK2 400 V

S [kVA]	10 ms		20 ms		30 ms	
	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]
10	33	11	33	22	33	33
15	49	24	49	48	49	72
20	70	49	70	98	70	147
30	101	102	101	204	101	306
40	138	190	138	381	138	571

IK2 400 V

S [kVA]	50 ms		100 ms		200 ms	
	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]	I[A]	I^2t [A^2s]
10	33	54	33	109	33	218
15	49	120	49	240	49	480
20	70	245	70	490	70	980
30	101	510	101	1020	101	2040
40	138	952	138	1904	138	3809

IK3 – Short Circuit between Three Phases for 3:3 UPS

IK3 400 V

S [kVA]	10 ms		20 ms		30 ms	
	I[A]	I²t [A²s]	I[A]	I²t [A²s]	I[A]	I²t [A²s]
10	37	14	37	27	37	41
15	53	28	53	56	53	84
20	80	64	80	128	80	192
30	110	121	110	242	110	363
40	146	213	146	426	146	639

IK3 400 V

S [kVA]	50 ms		100 ms		200 ms	
	I[A]	I²t [A²s]	I[A]	I²t [A²s]	I[A]	I²t [A²s]
10	37	68	37	137	37	274
15	53	140	53	281	53	562
20	80	320	80	640	80	1280
30	110	605	110	1210	110	2420
40	146	1066	146	2132	146	4263

IK1 – Short Circuit between a Phase and Neutral for 3:1 UPS

IK1 230 V

S [kVA]	10 ms		20 ms		30 ms	
	I[A]	I²t [A²s]	I[A]	I²t [A²s]	I[A]	I²t [A²s]
10	112	125	112	251	112	376
15	150	225	150	450	150	675
20	230	529	230	1058	230	1587
30	276	762	276	1524	276	2285

IK1 230 V

S [kVA]	50 ms		100 ms		200 ms	
	I[A]	I²t [A²s]	I[A]	I²t [A²s]	I[A]	I²t [A²s]
10	112	627	112	1254	112	2509
15	150	1125	150	2250	150	4500
20	230	2645	230	5290	230	10580
30	276	3809	276	7618	276	15235

Leakage Current

UPS rating	Leakage current at 100% load (mA)
10 kVA	250
15 kVA	250
20 kVA	250
30 kVA	100
40 kVA	100

NOTE: As per IEC 62477-1, the leakage current should not exceed 5% of the rated input current.

Environment

3:3 UPS

	Operating	Storage
Temperature	0 °C to 40 °C without load derating.	-25 °C to 55 °C for systems without batteries.
Relative humidity	0-95% non-condensing	0-95% non-condensing
Elevation	Designed for operation in 0-1000 m elevation at 100% load. Derating required from 1000-2000 m with forced air cooling: Up to 1000 m: 1.000 Up to 1500 m: 0.975 Up to 2000 m: 0.950	
Audible noise one meter from unit	**10 kVA UPS**: 45 dB at 70% load; 53 dB at 100% load **15 kVA UPS**: 46 dB at 70% load; 54 dB at 100% load **20 kVA UPS**: 48 dB at 70% load; 57 dB at 100% load **30 kVA UPS**: 58 dB at 70% load; 61 dB at 100% load **40 kVA UPS**: 60 dB at 70% load; 63 dB at 100% load	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

3:1 UPS

	Operating	Storage
Temperature	0 °C to 40 °C without load derating.	-25 °C to 55 °C for systems without batteries.
Relative humidity	0-95% non-condensing	0-95% non-condensing
Elevation	Designed for operation in 0-1000 m elevation at 100% load. Derating required from 1000-2000 m with forced air cooling: Up to 1000 m: 1.000 Up to 1500 m: 0.975 Up to 2000 m: 0.950	
Audible noise one meter from unit	**10 kVA UPS**: 44 dB at 70% load; 53 dB at 100% load **15 kVA UPS**: 46 dB at 70% load; 55 dB at 100% load **20 kVA UPS**: 47 dB at 70% load; 57 dB at 100% load **30 kVA UPS**: 57 dB at 70% load; 61 dB at 100% load	
Protection class	IP20	
Color	RAL 9003, gloss level 85%	

Compliance

Safety	IEC 62040-1: 2017, Edition 2.0, Uninterruptible Power Systems (UPS) - Part 1: Safety requirements IEC 62040-1/A1: 2021+A2: 2022 Amendment 1 + Amendment 2
EMC/EMI/RFI	IEC 62040-2: 2005, 2nd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements C3 IEC 62040-2: 2016, 3rd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements C3
Performance	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	ISTA 2B 2011
Earthing system	Supports TN, TT(43), IT(44)
Overvoltage category	OVC III(45)
Protective class	I
Pollution degree	2

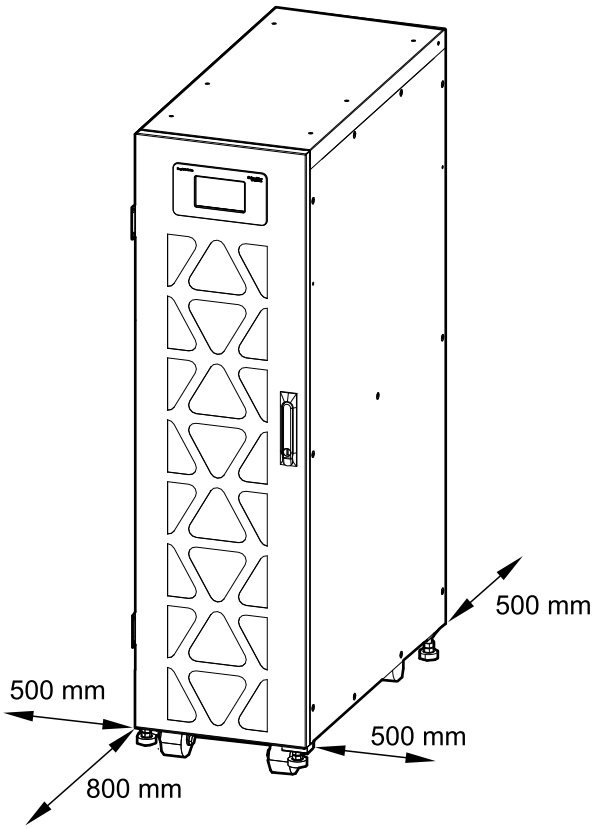
(43) Neutral connection is mandatory for supported TT earthing system.
(44) Neutral connection is mandatory for supported IT earthing system.
(45) The UPS is compliant with OVC II according to IEC 62040-1:2008 (1st Edition) + Amendment 1:2013.

UPS Weights and Dimensions

	UPS rating (Commercial Reference)	Weight kg	Height mm	Width mm	Depth mm
3:3 UPS	10 kVA (E3SP10KHB)	114	1400	380	907
	15 kVA (E3SP15KHB)	116	1400	380	907
	20 kVA (E3SP20KHB)	116	1400	380	907
	30 kVA (E3SP30KHB)	145	1400	500	940
	40 kVA (E3SP40KHB)	150	1400	500	940
3:1 UPS	10 kVA (E3SP10K3IB)	113	1400	380	907
	15 kVA (E3SP15K3IB)	114	1400	380	907
	20 kVA (E3SP20K3IB)	116	1400	380	907
	30 kVA (E3SP30K3IB)	146	1400	500	940

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.



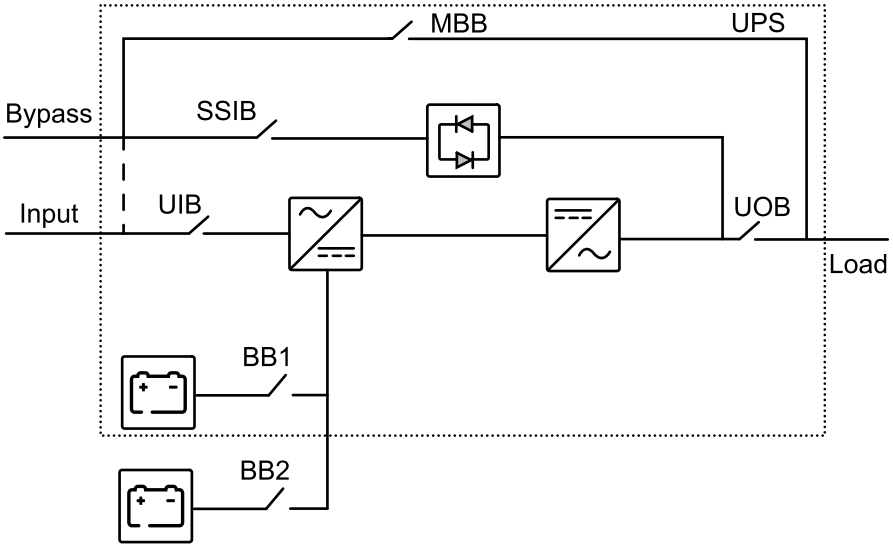
NOTE: The recommended rear clearance is 500 mm. The required minimum rear clearance is 150 mm for correct air flow.

Overview

Overview of Single UPS

UIB	Unit input disconnect device
SSIB	Static switch input disconnect device
UOB	Unit output disconnect device
MBB	Maintenance bypass disconnect device
BB1	Battery disconnect device 1 for internal batteries
BB2	Battery disconnect device 2 for external batteries

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.

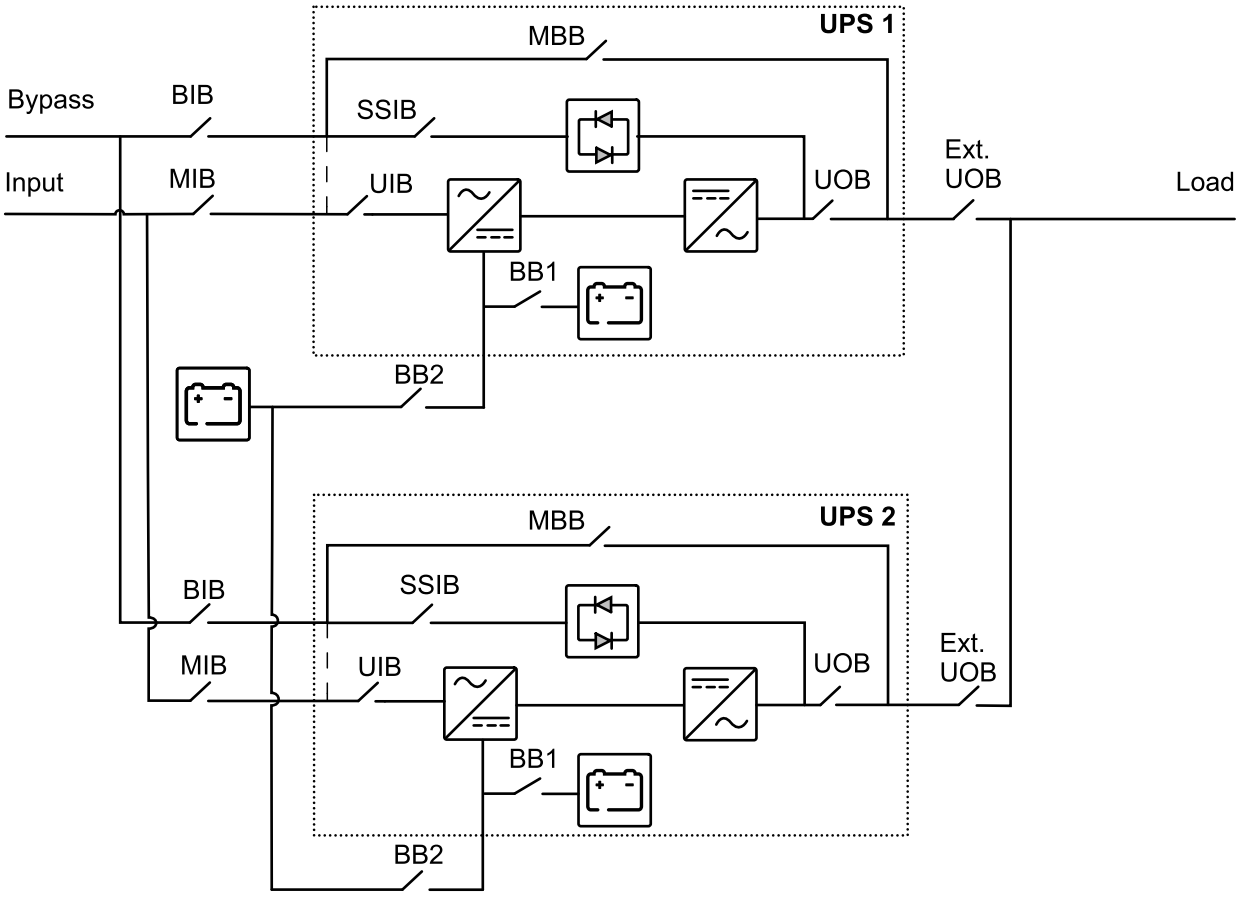


NOTE: Ensure that any external battery matches the internal battery's type and configuration. Schneider Electric offers modular battery modules such as E3SXR6/E3SXR8, which are factory-tested to work with the provided internal batteries. To order E3SXR6/E3SXR8 or verify compatibility, please contact Schneider Electric.

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

MIB	Main input disconnect device
BIB	Bypass input disconnect device
UIB	Unit input disconnect device
SSIB	Static switch input disconnect device
UOB	Unit output disconnect device
Ext. UOB	External unit output disconnect device
MBB	Maintenance bypass disconnect device
BB1	Battery disconnect device 1 for internal batteries
BB2	Battery disconnect device 2 for external batteries

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.



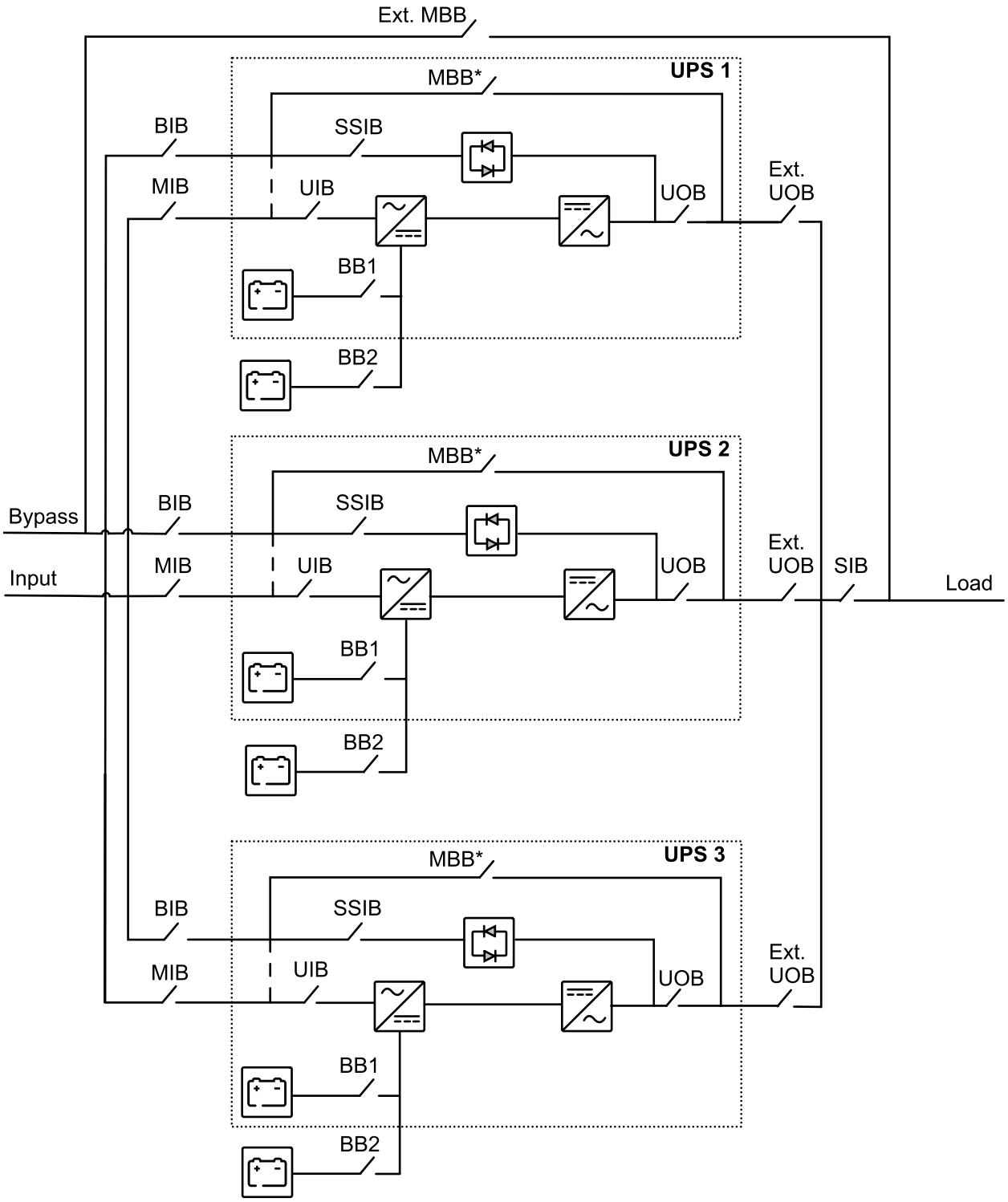
NOTE: Ensure that any external battery matches the internal battery's type and configuration. Schneider Electric offers modular battery modules such as E3SXR6/E3SXR8, which are factory-tested to work with the provided internal batteries. To order E3SXR6/E3SXR8 or verify compatibility, please contact Schneider Electric.

Overview of Parallel System

MIB	Main input disconnect device
BIB	Bypass input disconnect device
UIB	Unit input disconnect device
SSIB	Static switch input disconnect device
UOB	Unit output disconnect device
Ext. UOB	External unit output disconnect device
MBB	Maintenance bypass disconnect device
Ext. MBB	External maintenance bypass disconnect device
SIB	System isolation disconnect device
BB1	Battery disconnect device 1 for internal batteries
BB2	Battery disconnect device 2 for external batteris

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.

NOTE: In parallel systems with an external maintenance bypass disconnect device Ext. MBB, the internal maintenance bypass disconnect devices MBB* must be padlocked in the open (OFF) position.



NOTE: Ensure that any external battery matches the internal battery's type and configuration. Schneider Electric offers modular battery modules such as E3SXR6/E3SXR8, which are factory-tested to work with the provided internal batteries. To order E3SXR6/E3SXR8 or verify compatibility, please contact Schneider Electric.

Installation Procedure

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS must be secured against movement. Lower the leveling feet until the casters no longer have contact with the floor once the UPS is in its final position.

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

1. Move the UPS to the final location by rolling it over the floor on the casters.
2. Position the UPS, page 57.
3. Connect the Power Cables, page 62.
4. Connect the Signal Cables, page 90.
5. Connect the Modbus Cables, page 95.
6. Only for parallel systems: Connect the Parallel Cables in Parallel Systems, page 96.
7. Install Batteries in the UPS, page 99.

For moving or decommissioning the UPS after installation has been completed, see Decommission or Move the UPS to a New Location, page 105.

Position the UPS

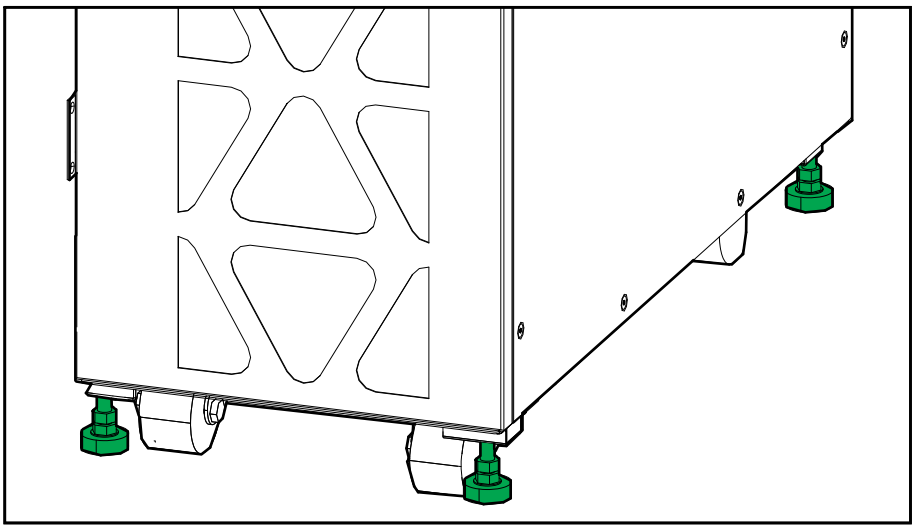
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

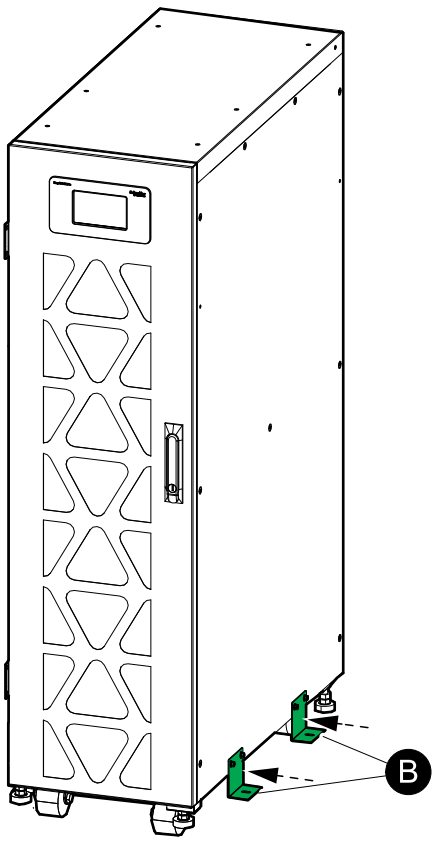
If the UPS has no internal batteries installed, the UPS must be secured against movement. Once the UPS is in its final position, reinstall the left and right transportation brackets on the UPS and mount them to the floor.

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

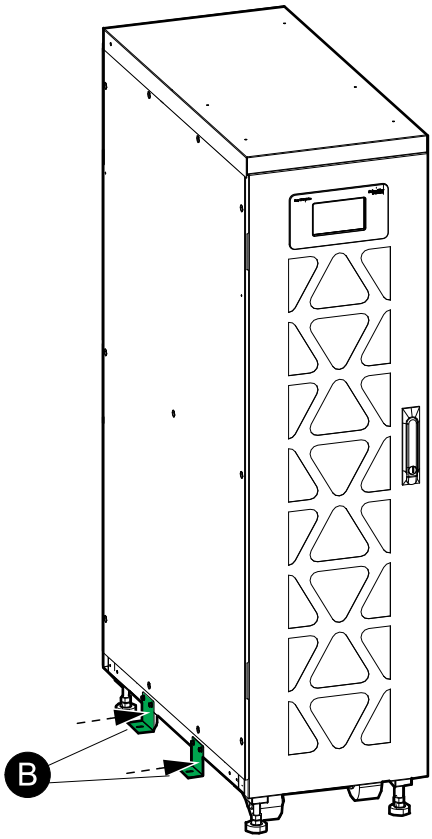
1. Move the UPS to its final location and use a wrench to lower the levelling feet. Ensure that the cabinet is level.



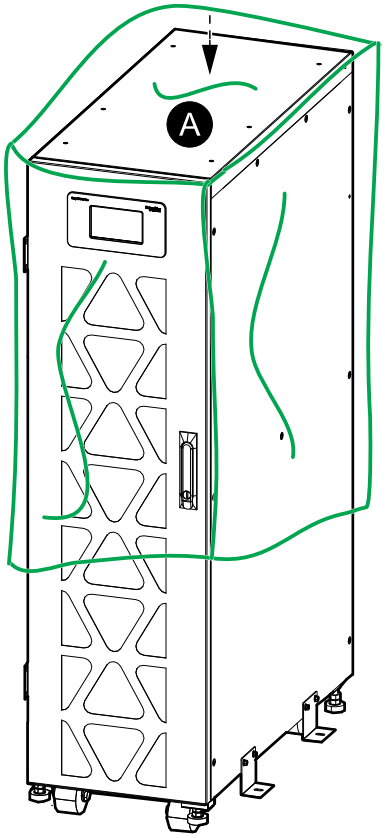
2. Reinstall the two right transportation brackets (marked (B) in the illustration - removed during receiving and unpacking of the UPS) on the UPS.



3. Reinstall the two left transportation brackets (marked (B) in the illustration - removed during receiving and unpacking of the UPS) on the UPS.

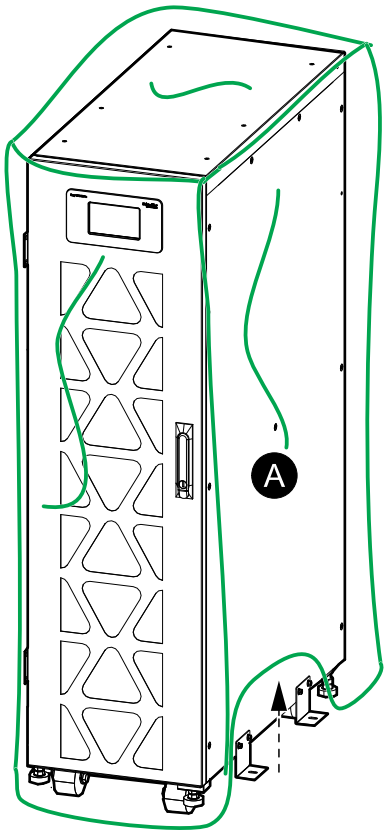


4. Mark the anchoring hole locations on the floor according to the left and right transportation brackets.
5. Move the UPS to the side and cover the UPS with the packaging bag (marked (A) in the illustration) to protect against dust.

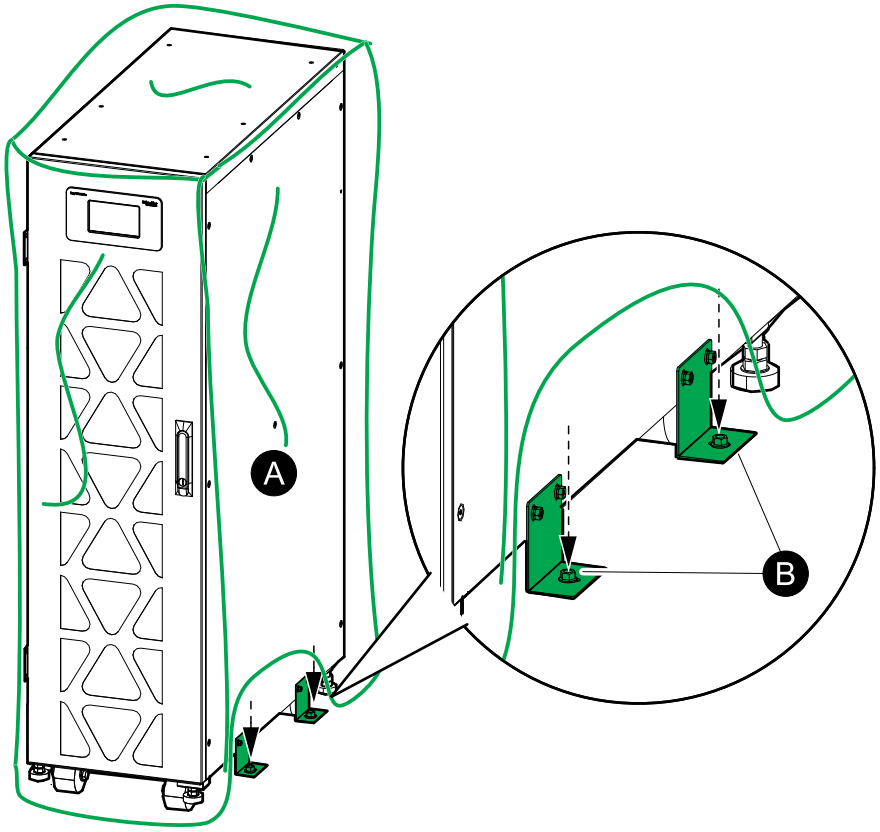


6. Drill the anchoring holes according to national and local requirements. The hole diameter for the left and right transportation brackets is ø10 mm.

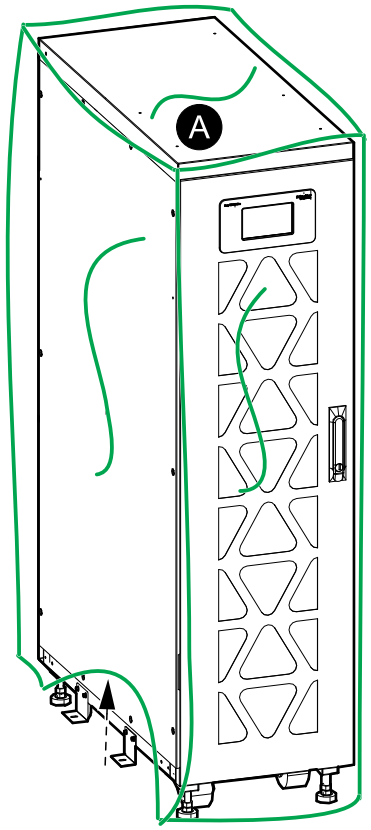
7. Move the UPS to the final position.
8. Roll up the right side of the packaging bag (marked (A) in the illustration), so the right bottom part of the UPS is free.



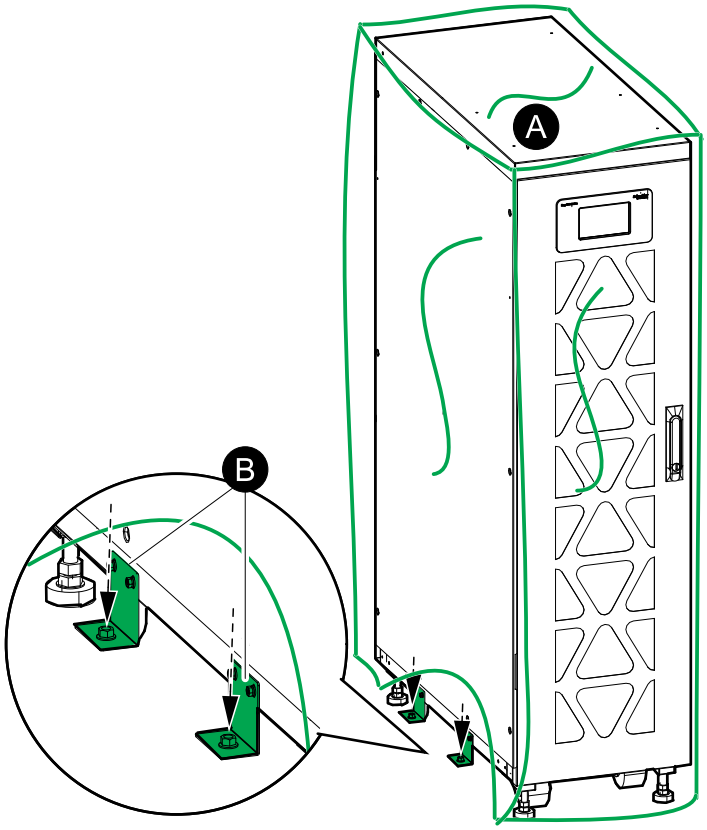
9. Mount the right transportation brackets (marked (B) in the illustration) to the floor. Use appropriate hardware for the floor type – the hole diameter in the brackets is ø10 mm. The requirement is M8 strength grade 8.8 hardware.



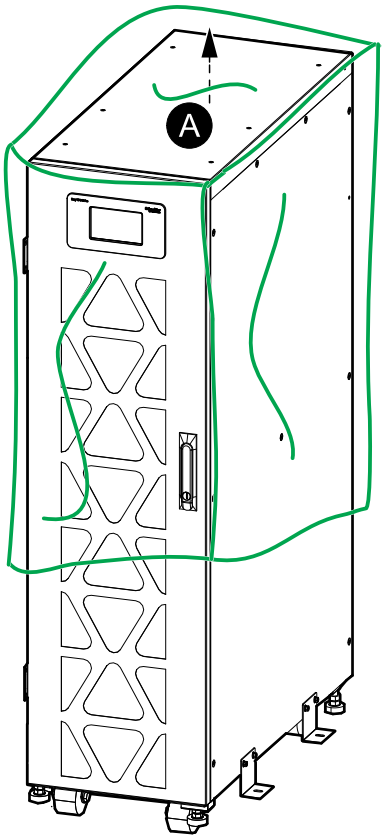
10. Roll up the left side of the packaging bag (marked (A) in the illustration), so the left bottom part of the UPS is free.



11. Mount the left transportation brackets (marked (B) in the illustration) to the floor. Use appropriate hardware for the floor type – the hole diameter in the brackets is ø10 mm. The requirement is M8 strength grade 8.8 hardware.



12. Remove the packaging bag (marked (A) in the illustration) and save for future use.

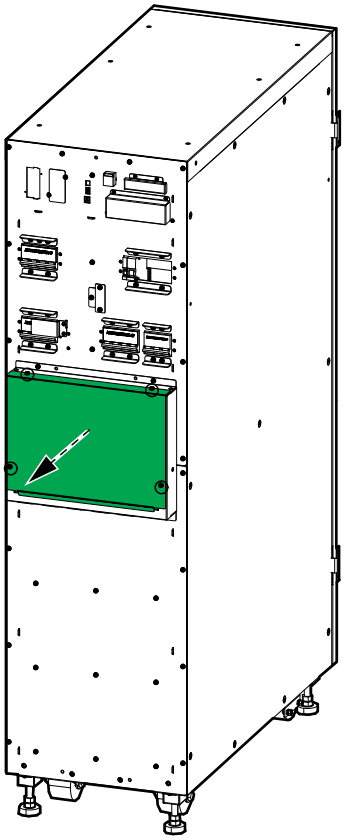


Connect the Power Cables

Connect the Power Cables in the 10-20 kVA 3:3 UPS

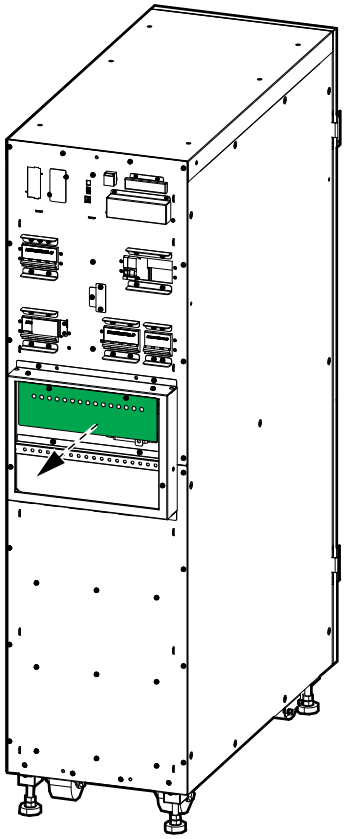
1. Ensure that all disconnect devices are in the OFF (open) position.
2. Remove the conduit box cover.

Rear View of 10-20 kVA 3:3 UPS



3. Remove the transparent protective cover from the terminal blocks.

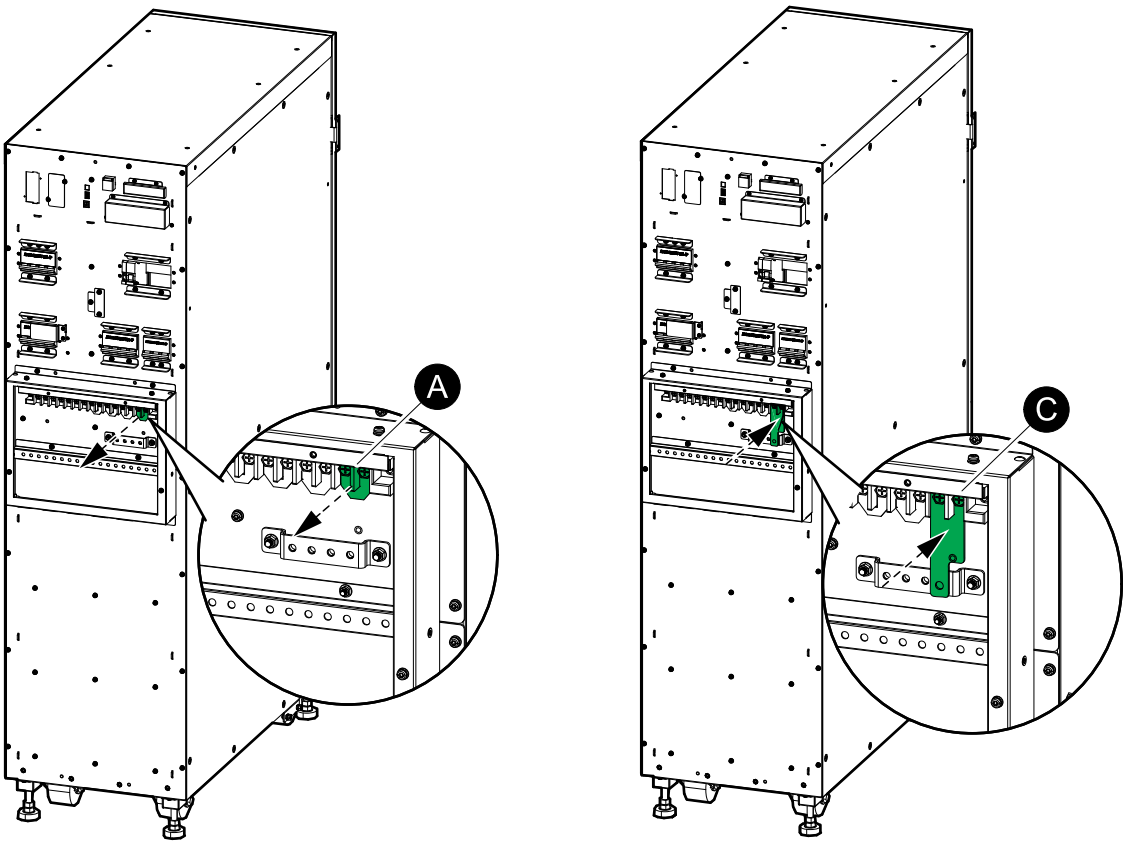
Rear View of 10-20 kVA 3:3 UPS



4. **In single mains systems**: Perform one of the following to prepare for the earthing system:

   – **For TN-C earthing system**: Remove the fourth V-shaped jumper (Neutral) (marked (A) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the same position. The Y-shaped jumper is provided in the paper bag attached to the installation manual.

Rear View of 10-20 kVA 3:3 UPS – TN-C Earthing System (Single Mains)

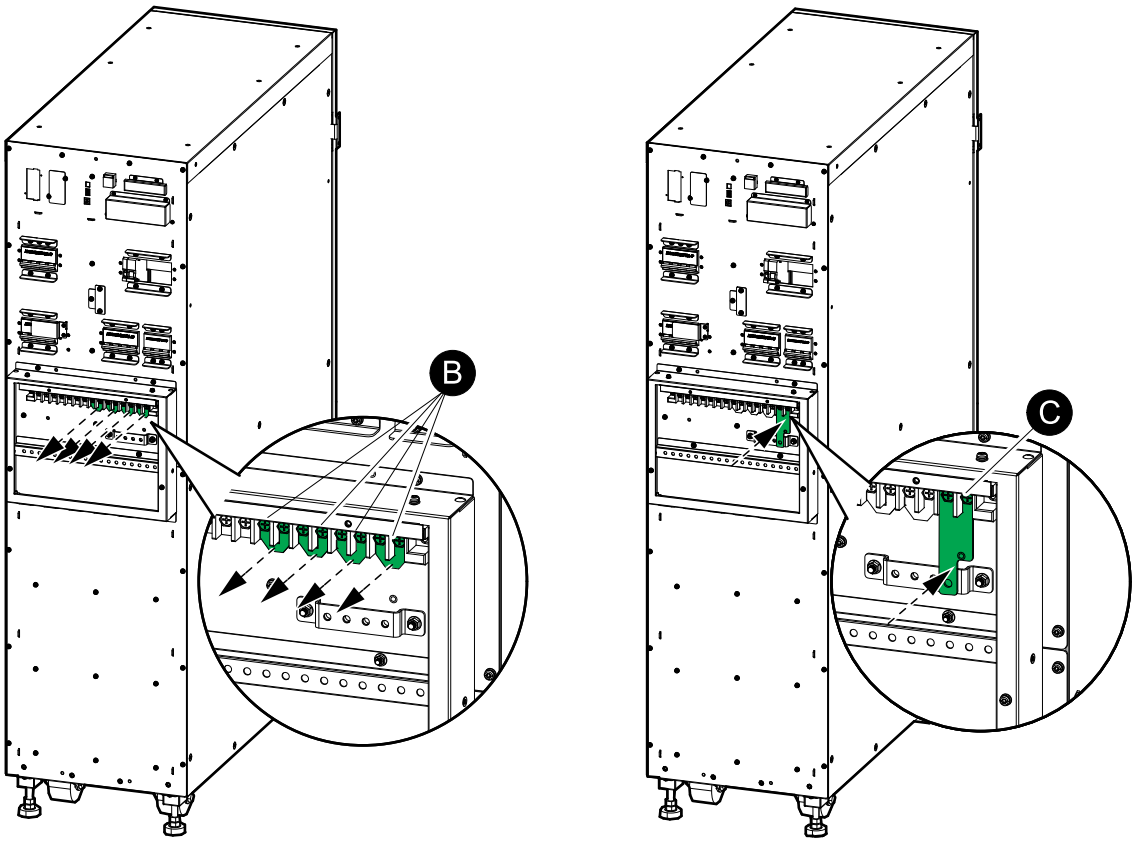


   – **For non TN-C earthing system**: No action is needed to prepare for the earthing system, continue to the next step.

5. **In dual mains systems**: Perform one of the following to prepare for the earthing system:

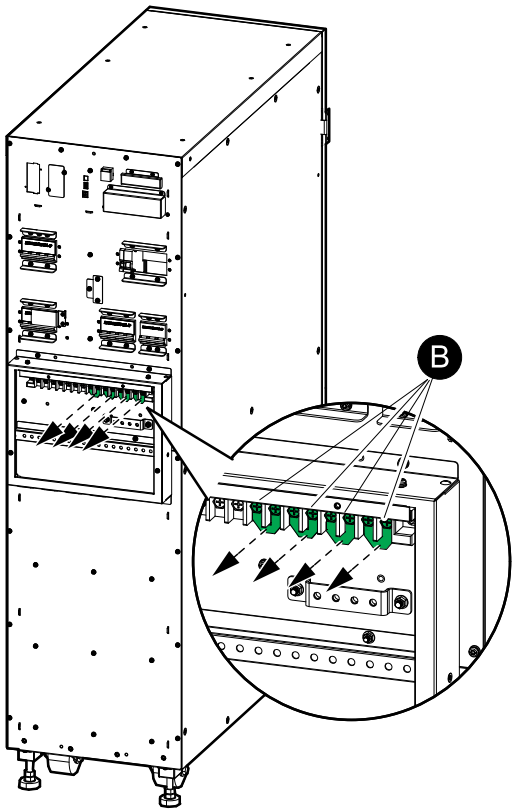
   – **For TN-C earthing system**: Remove the four V-shaped jumpers (marked (B) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the fourth position in the terminal blocks. The Y-shaped jumper is provided in the paper bag attached with the installation manual.

Rear View of 10-20 kVA 3:3 UPS – TN-C Earthing System (Dual Mains)



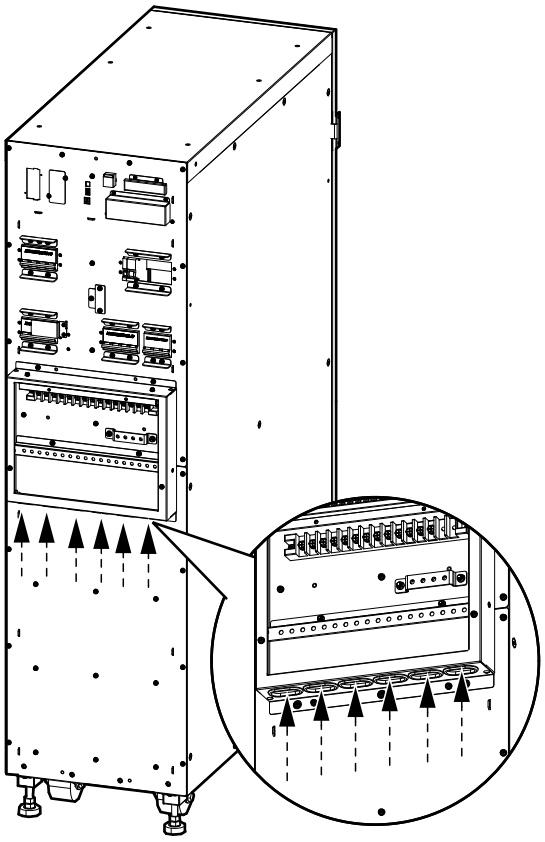
   – **For non TN-C earthing system**: Remove the four V-shaped jumpers (Marked (B) in the illustration) from the terminal blocks.

Rear View of 10-20 kVA 3:3 UPS – Non TN-C Earthing System (Dual Mains)



6. Cut holes on the cable brush plate.

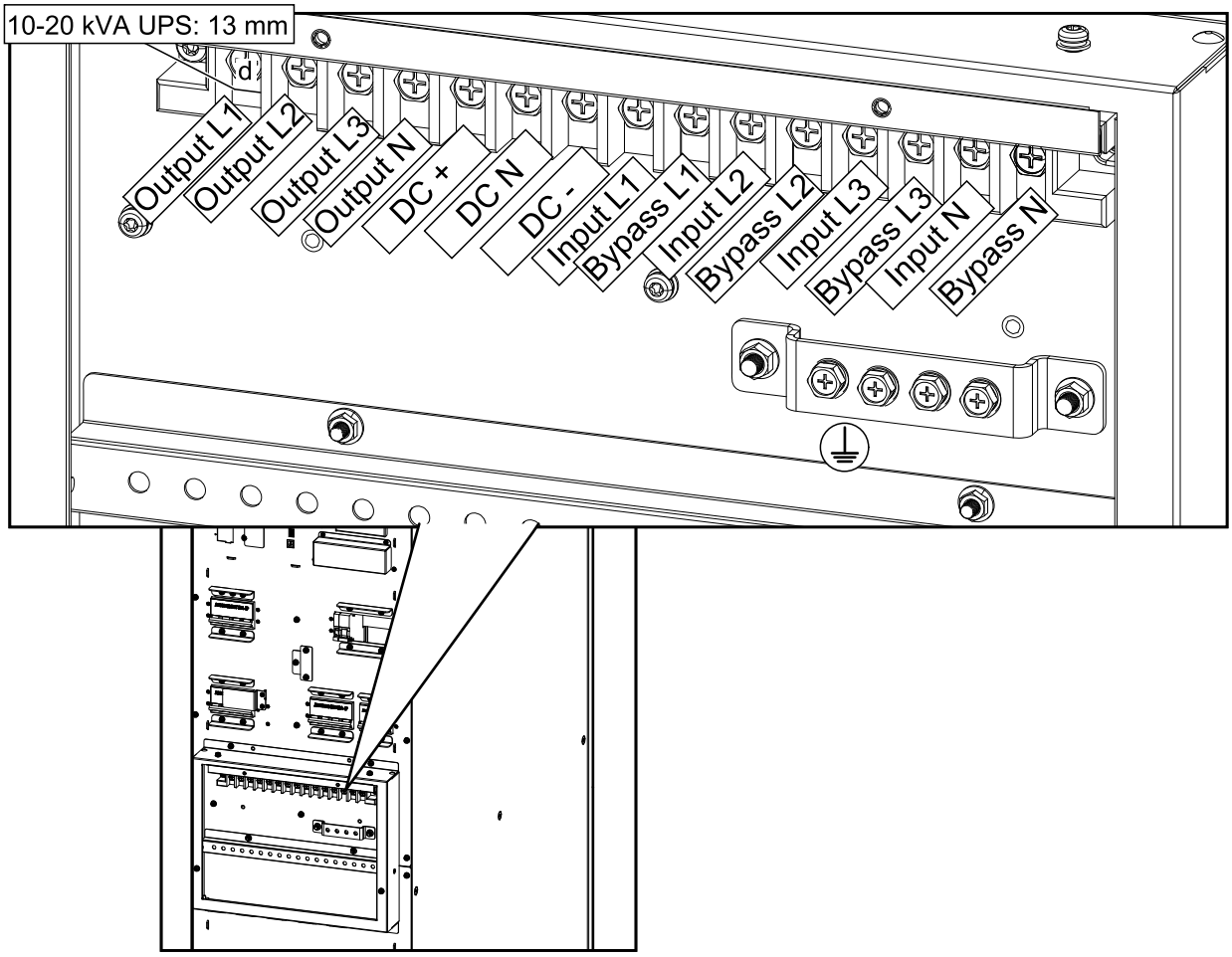
Rear View of 10-20 kVA 3:3 UPS



7. Route the power cables through the bottom of the conduit box.

8. Connect the PE cable to the PE terminal.

Rear View of 10-20 kVA 3:3 UPS



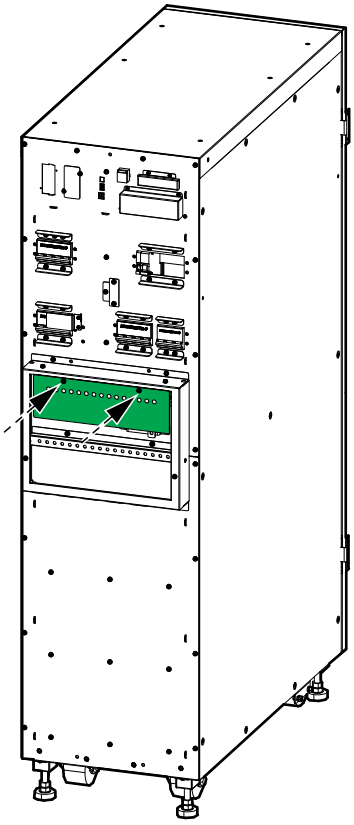
9. Connect the external battery cables to the DC terminals (DC+, DC N, DC-).

   NOTE: Ensure that the type and number of blocks are the same as the internal batteries.

10. Connect the output cables to the output terminals (L1, L2, L3, N).
11. Connect the input cables to the input terminals (L1, L2, L3, N).
12. **Only for dual mains system**: Connect the bypass cables to the bypass terminals (L1, L2, L3, N).

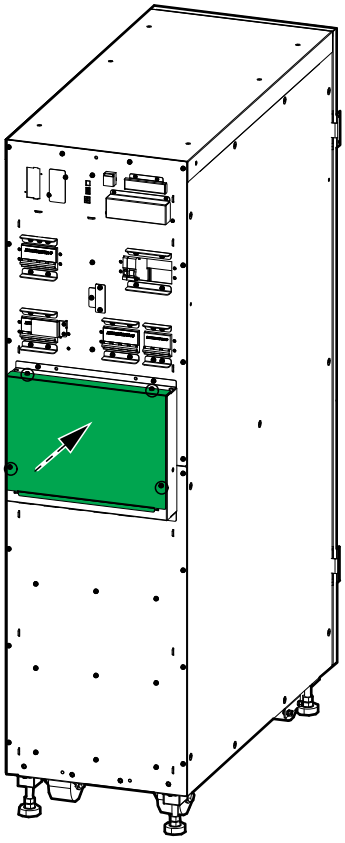
13. Reinstall the transparent protective cover over the terminal blocks.

Rear View of 10-20 kVA 3:3 UPS



14. Reinstall the conduit box cover.

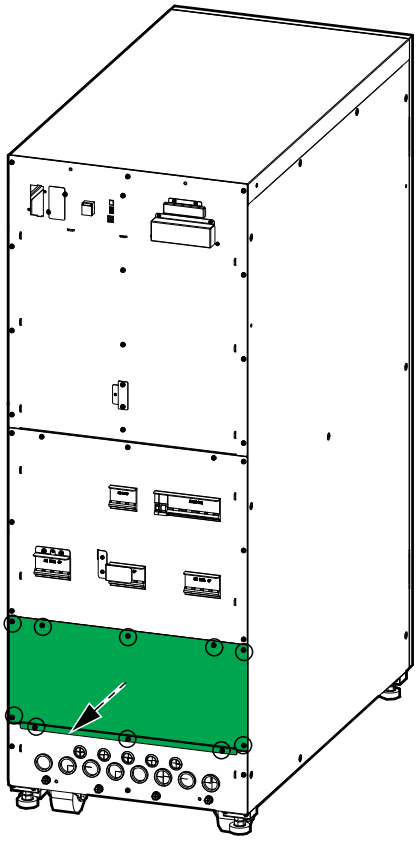
Rear View of 10-20 kVA 3:3 UPS



Connect the Power Cables in the 30-40 kVA 3:3 UPS

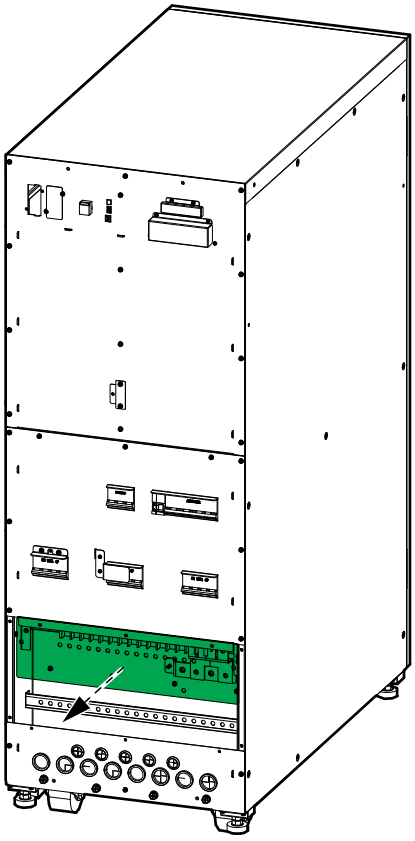
1. Ensure that all disconnect devices are in the OFF (open) position.
2. Remove the conduit box cover.

Rear View of 30-40 kVA 3:3 UPS



3. Remove the transparent protective cover from the terminal blocks.

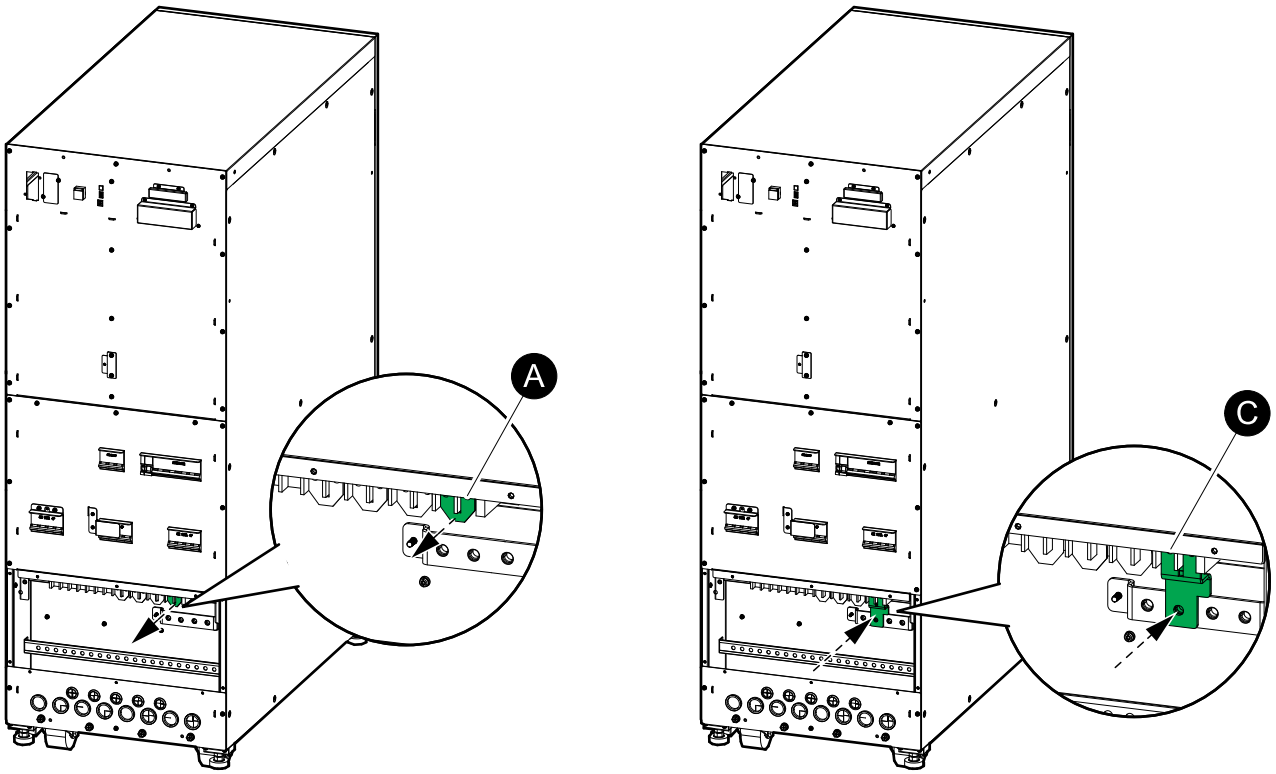
Rear View of 30-40 kVA 3:3 UPS



4. **In single mains systems**: Perform one of the following to prepare for the earthing system:

   – **For TN-C earthing system**: Remove the fourth V-shaped jumper (Neutral) (marked (A) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the same position. The Y-shaped jumper is provided in the paper bag attached to the installation manual.

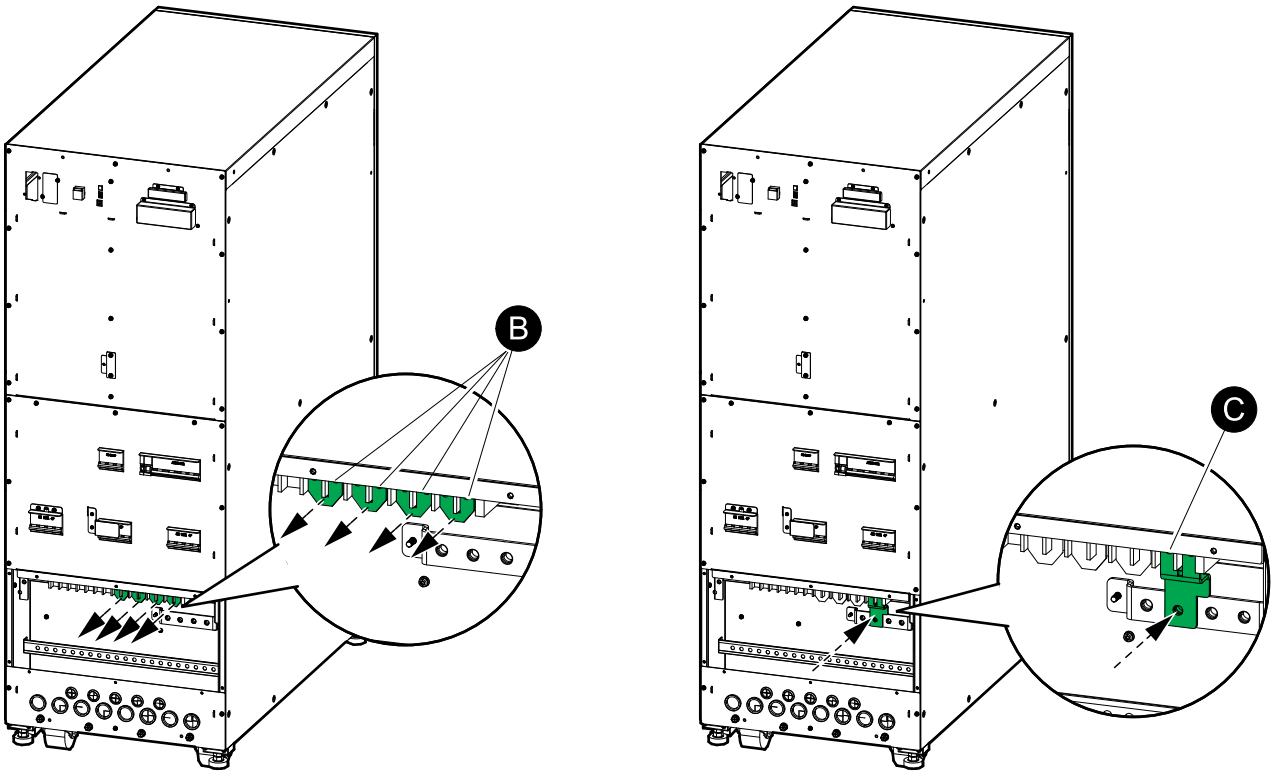
Rear View of 30-40 kVA 3:3 UPS – TN-C Earthing System (Single Mains)



   – **For non TN-C earthing system**: No action is needed to prepare for the earthing system, continue to the next step.

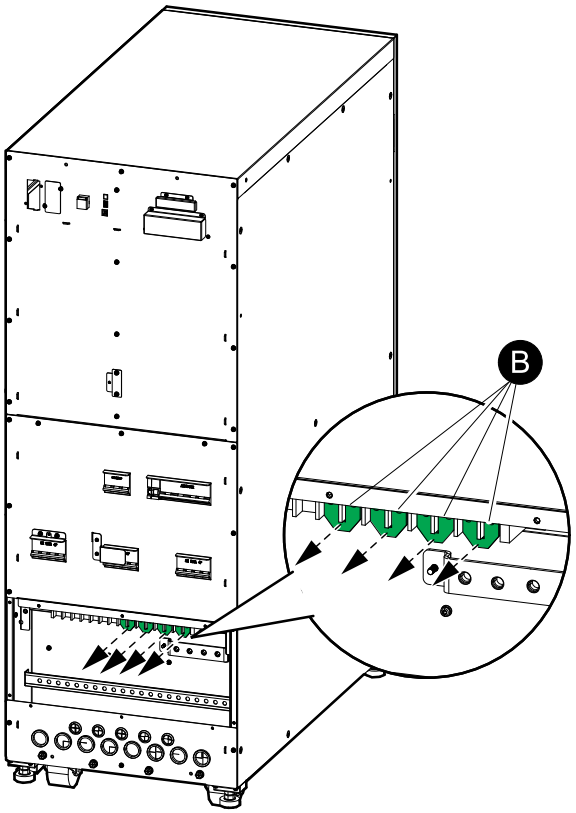
5. **In dual mains systems**: Perform one of the following to prepare for the earthing system:
   - **For TN-C earthing system**: Remove the four V-shaped jumpers (marked (B) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the fourth position in the terminal blocks. The Y-shaped jumper is provided in the paper bag attached with the installation manual.

Rear View of 30-40 kVA 3:3 UPS – TN-C Earthing System (Dual Mains)



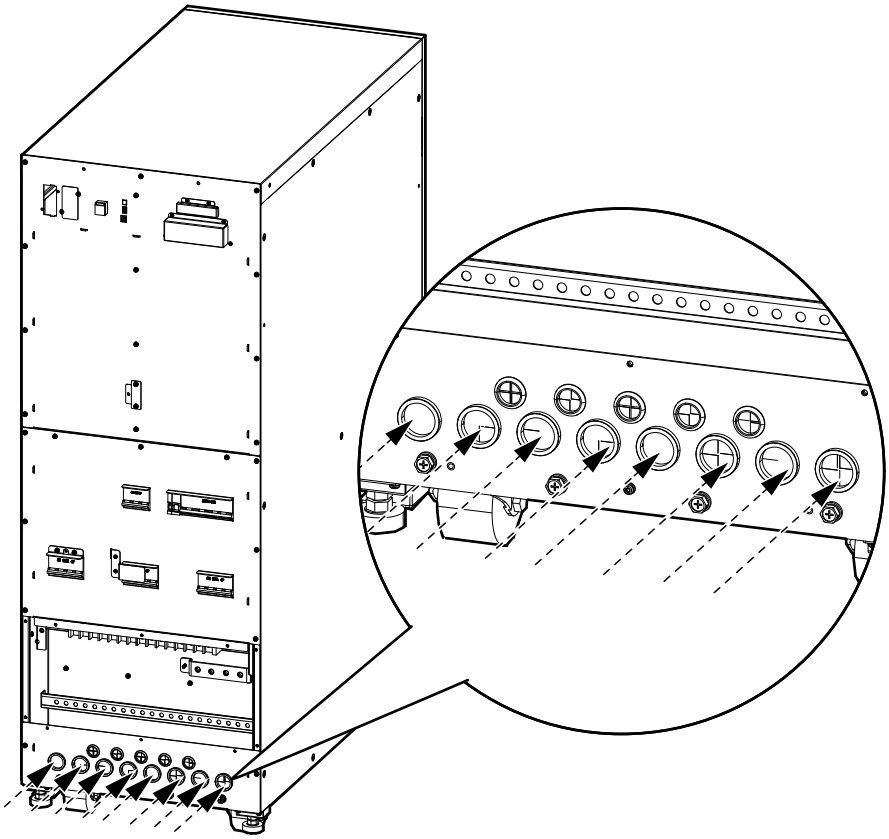
   - **For non TN-C earthing system**: Remove the four V-shaped jumpers (marked (B) in the illustration) from the terminal blocks.

Rear View of 30-40 kVA 3:3 UPS – TN-C Earthing System (Dual Mains)

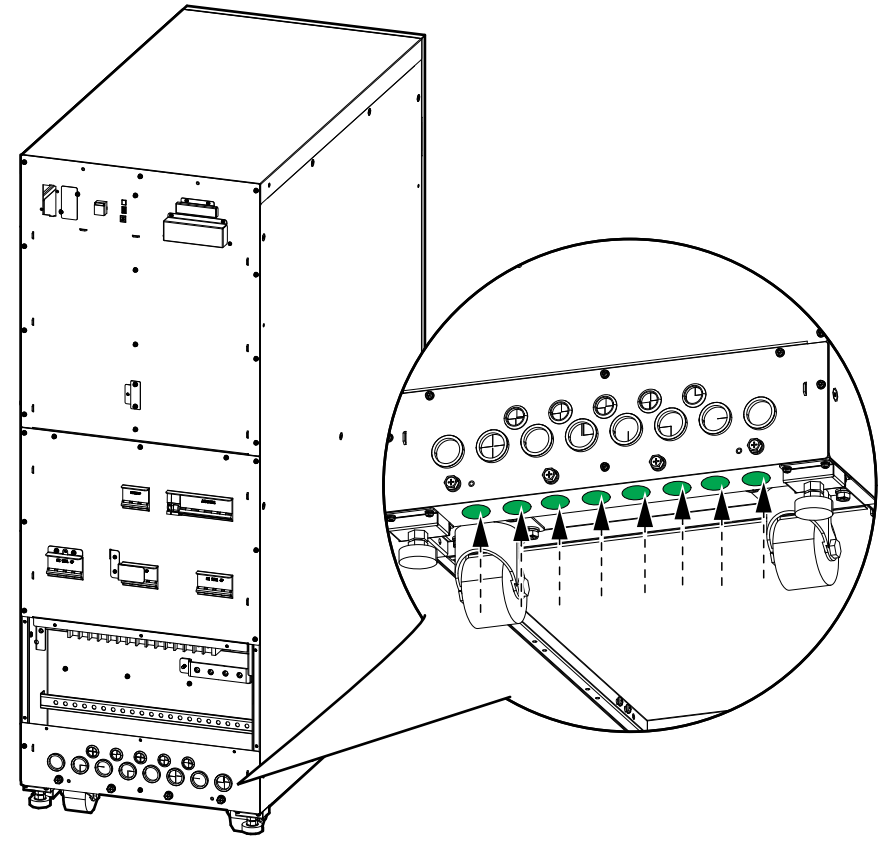


6. Cut holes on the cable brush plate. Remove the rear or bottom knock out holes based on cable entry route.

Rear View of 30-40 kVA 3:3 UPS (Rear Entry Cables)



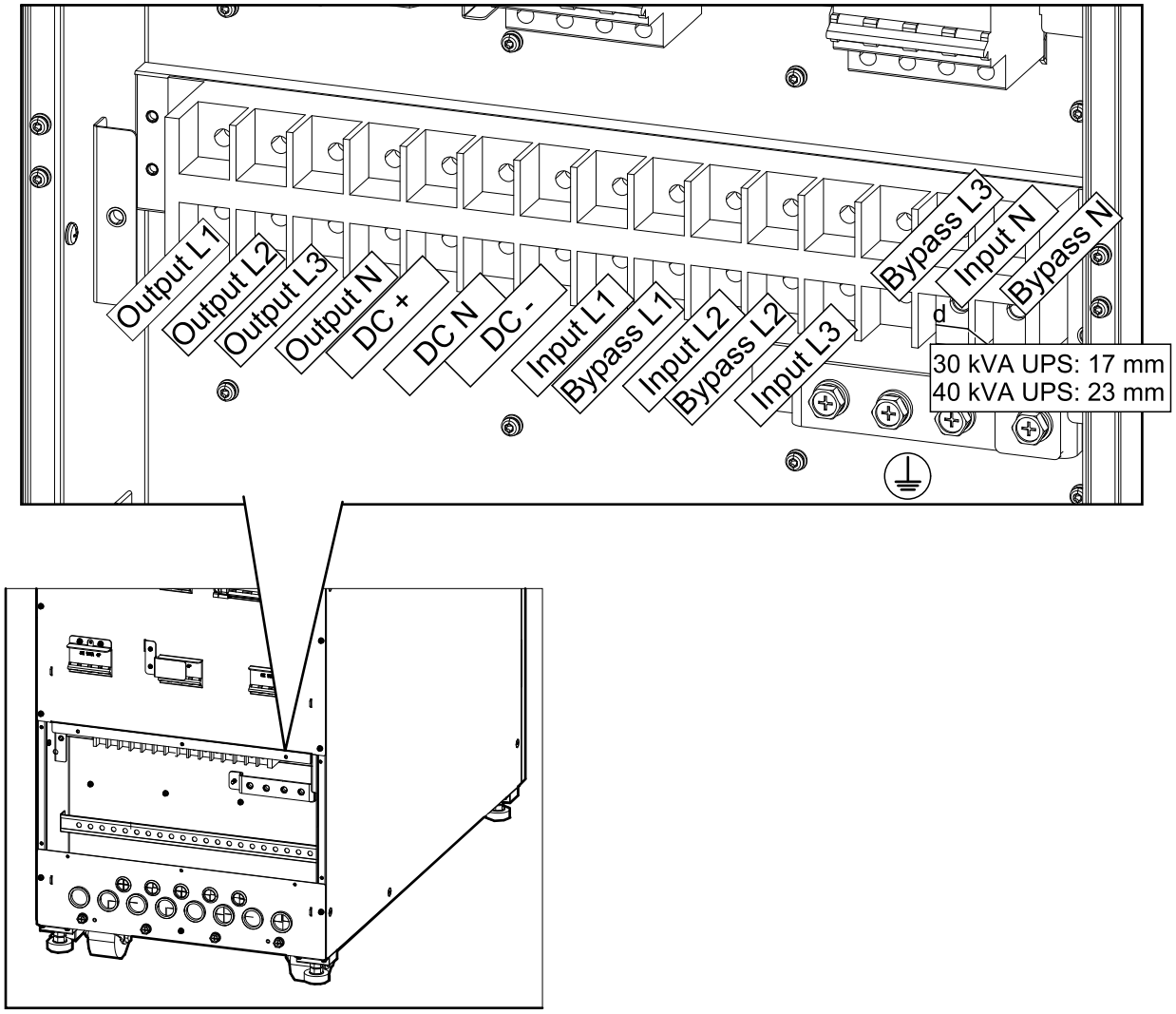
Rear View of 30-40 kVA 3:3 UPS (Bottom Entry Cables)



7. Route the power cables through the conduit box.

8. Connect the PE cable to the PE terminals.

Rear View of 30-40 kVA 3:3 UPS



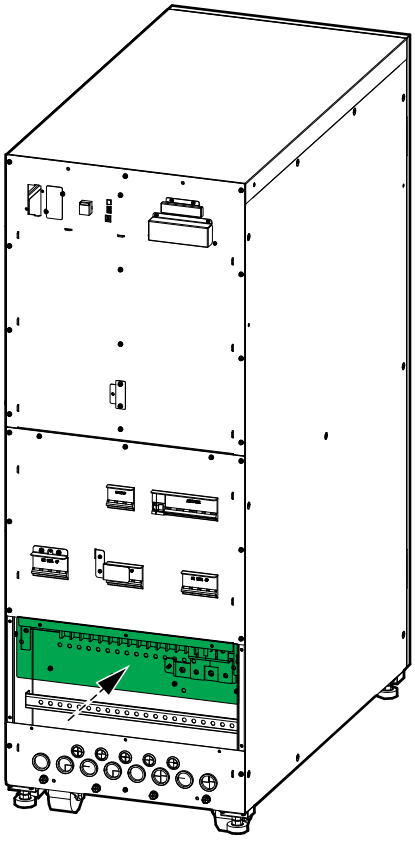
9. Connect the external battery cables to the DC terminals (DC+, DC N, DC-).

   NOTE: Ensure that the type and number of blocks are the same as the internal batteries.

10. Connect the output cables to the output terminals (L1, L2, L3, N).
11. Connect the input cables to the input terminals (L1, L2, L3, N).
12. **Only for dual mains system**: Connect the bypass cables to the bypass terminals (L1, L2, L3, N).

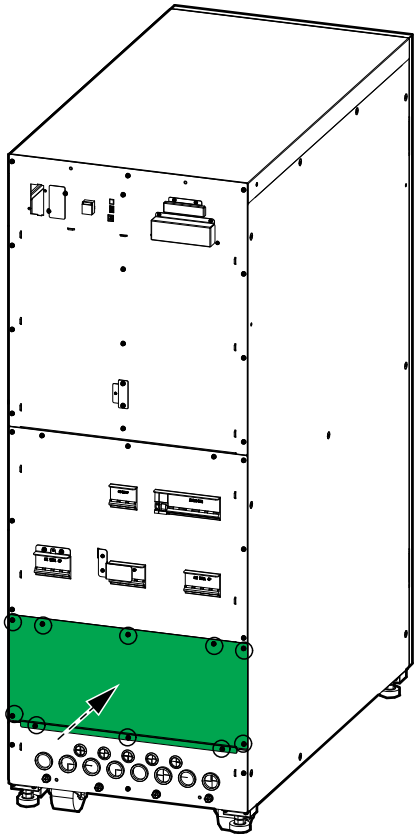
13. Reinstall the transparent protective cover over the terminal blocks.

Rear View of 30-40 kVA 3:3 UPS



14. Reinstall the conduit box cover.

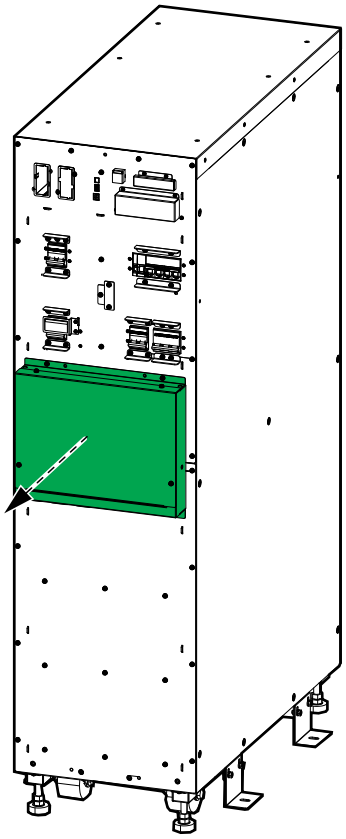
Rear View of 30-40 kVA 3:3 UPS



Connect the Power Cables in the 10-20 kVA 3:1 UPS

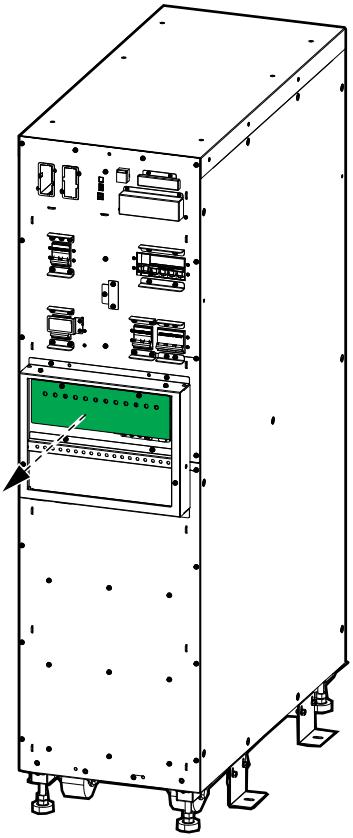
1. Ensure that all disconnect devices are in the OFF (open) position.
2. Remove the conduit box cover.

Rear View of 10-20 kVA 3:1 UPS



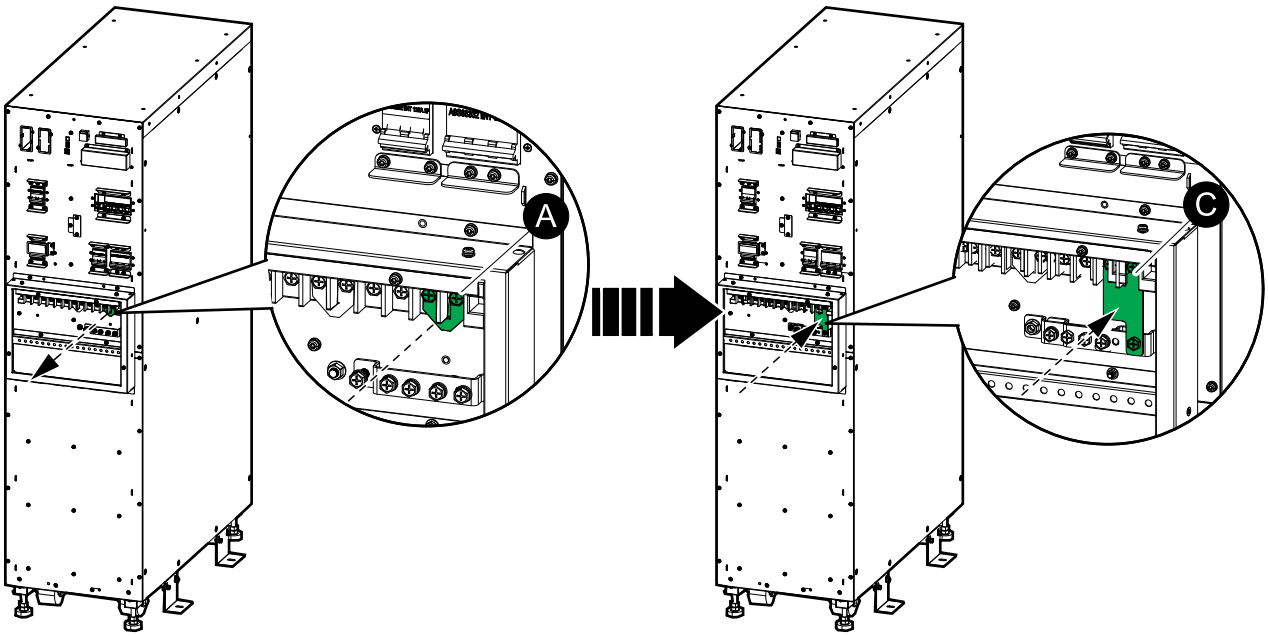
3. Remove the transparent protective cover from the terminal blocks.

Rear View of 10-20 kVA 3:1 UPS



4. **In single mains systems**: Perform one of the following to prepare for the earthing system:
   - **For TN-C earthing system of 3:1 UPS**: Remove the right V-shaped jumper (neutral) (marked (A) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the same position. The Y-shaped jumper is provided in the paper bag attached to the installation manual.

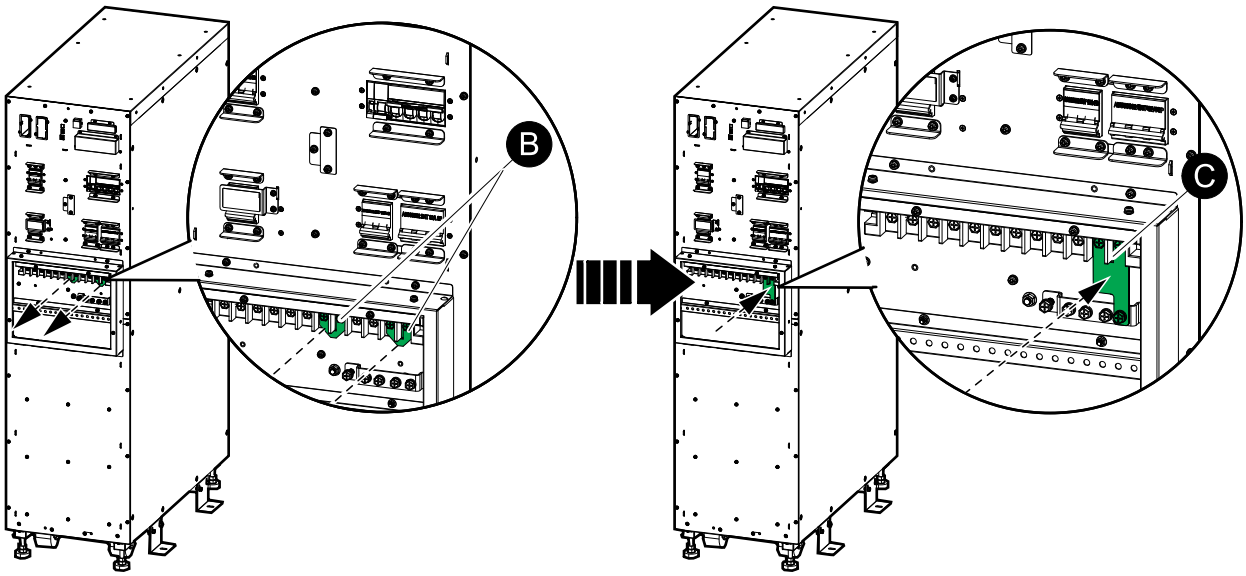
Rear View of 10-20 kVA 3:1 UPS – TN-C Earthing System (Single Mains)



   - **For non TN-C earthing system of 3:1 UPS**: No action is needed to prepare for the earthing system.

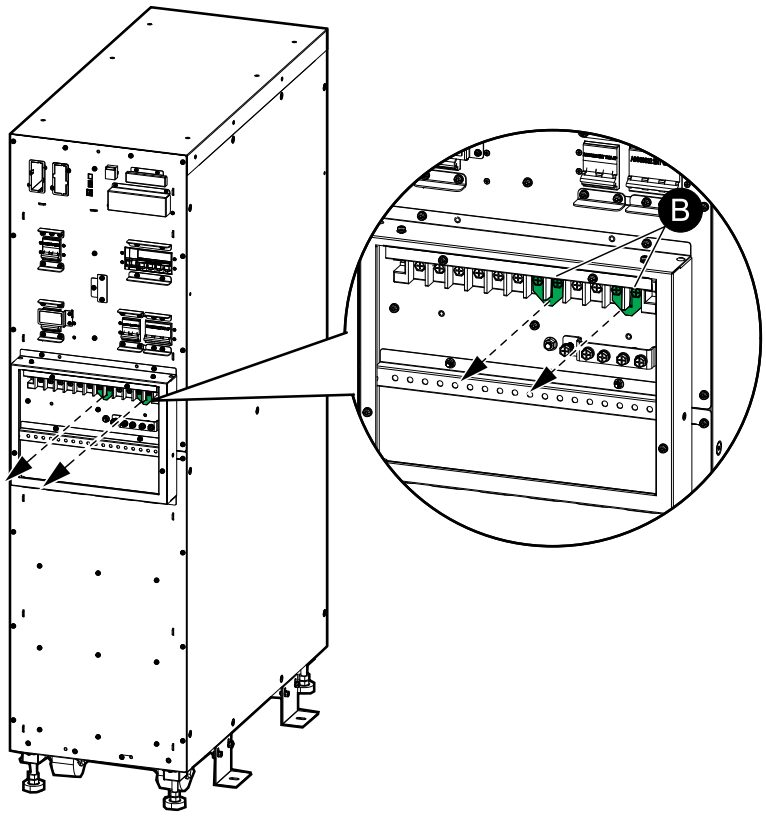
5. **In dual mains systems**: Perform one of the following to prepare for the earthing system:
   - **For TN-C earthing system of 3:1 UPS**: Remove the two V-shaped jumpers (marked (B) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the indicated position in the terminal blocks. The Y-shaped jumper is provided in the paper bag attached with the installation manual..

Rear View of 10-20 kVA 3:1 UPS – TN-C Earthing System (Dual Mains)



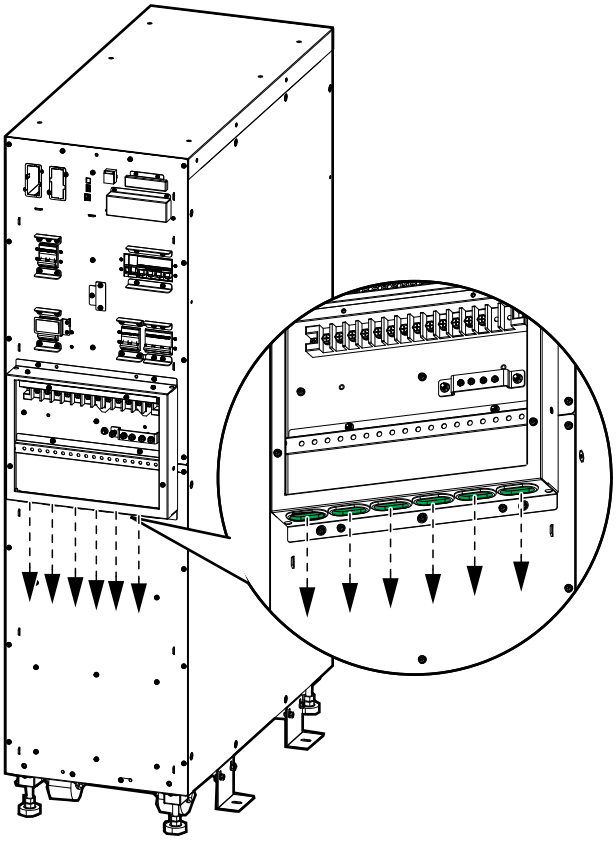
   - **For non TN-C earthing system of 3:1 UPS**: Remove the two V-shaped jumpers (marked (B) in the illustration) from the terminal blocks.

Rear View of 10-20 kVA 3:1 UPS – Non TN-C Earthing System (Dual Mains)



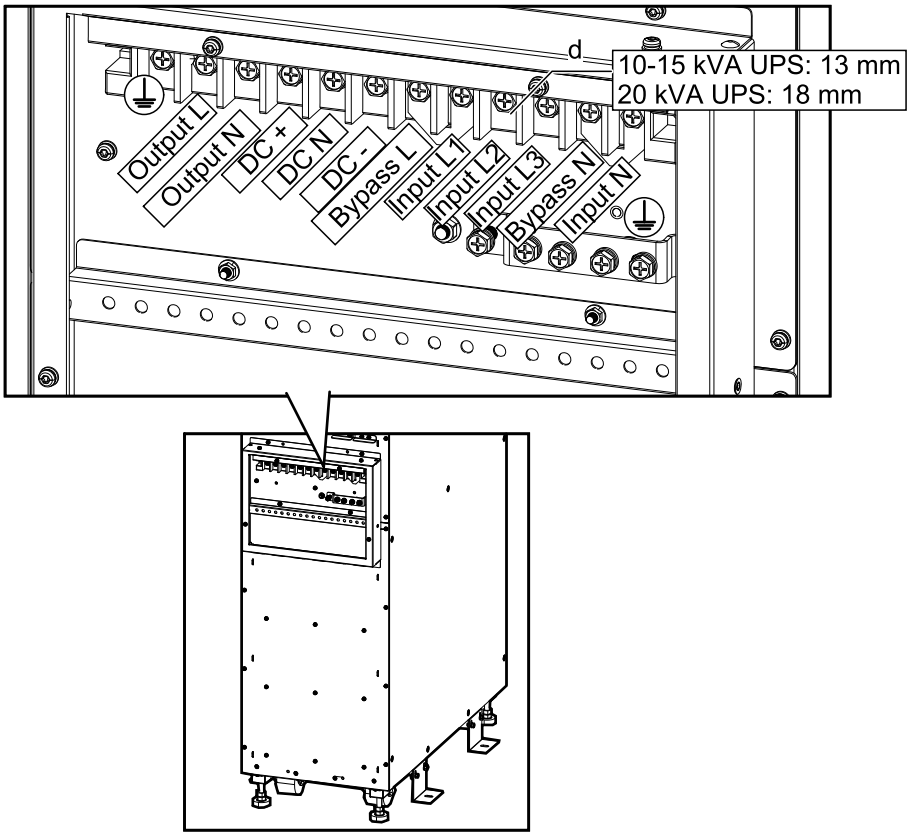
6. Cut holes on the cable brush plate.

Rear View of 10-20 kVA 3:1 UPS



7. Route the power cables through the bottom of the conduit box.
8. Connect the PE cable to the PE terminal.

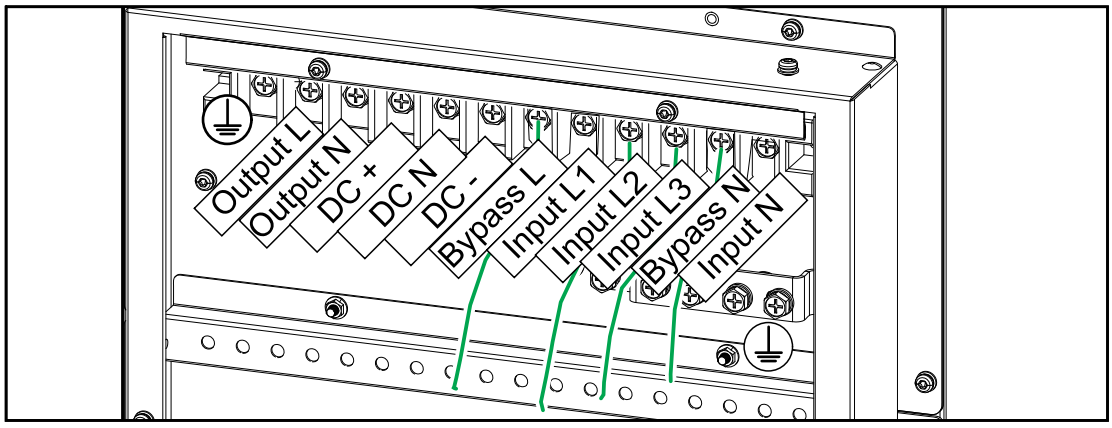
Rear View of 10-20 kVA 3:1 UPS



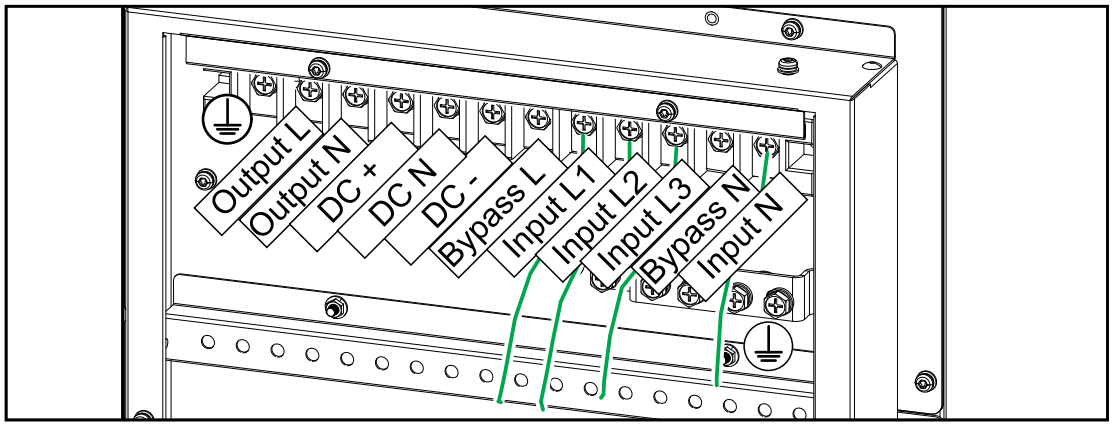
9. Connect the battery cables (+, N, -).
10. Connect the input cables (L1, L2, L3, N).

    NOTE: For single mains, input L1 and input N must be connected to the bypass L and bypass N.

Rear View of 10-20 kVA 3:1 UPS (Single Mains)



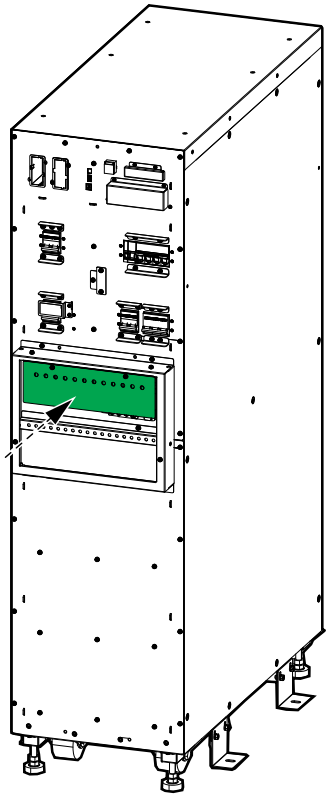
Rear View of 10-20 kVA 3:1 UPS (Dual Mains)



11. Connect the output cables (L, N).
12. **For dual mains system only**: Connect the bypass cables (L, N).

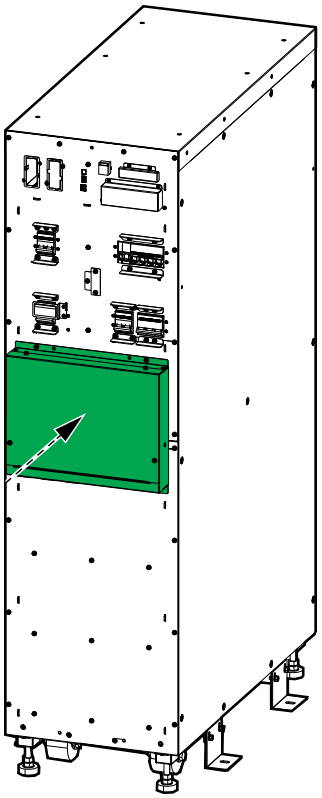
13. Reinstall the transparent protective cover over the terminal blocks.

Rear View of 10-20 kVA 3:1 UPS



14. Reinstall the conduit box cover.

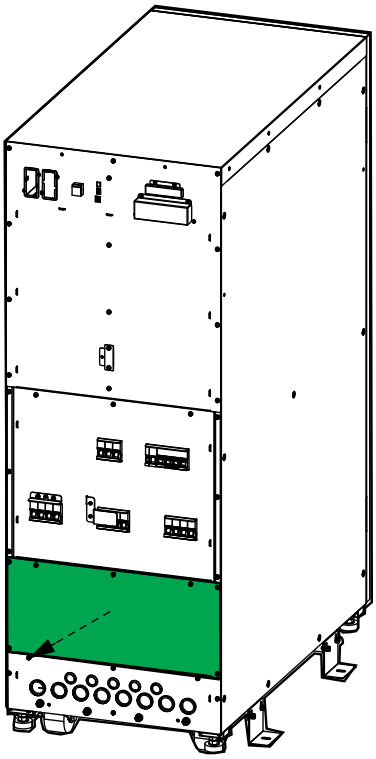
Rear View of 10-20 kVA 3:1 UPS



Connect the Power Cables in the 30 kVA 3:1 UPS

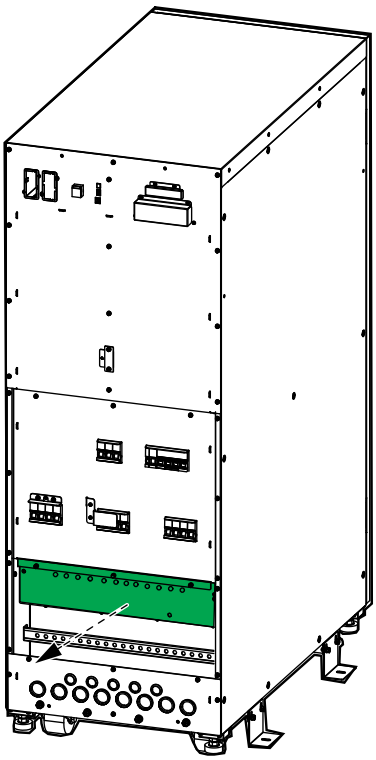
1. Ensure that all disconnect devices are in the OFF (open) position.
2. Remove the conduit box cover.

Rear View of 30 kVA 3:1 UPS



3. Remove the transparent protective cover from the terminal blocks.

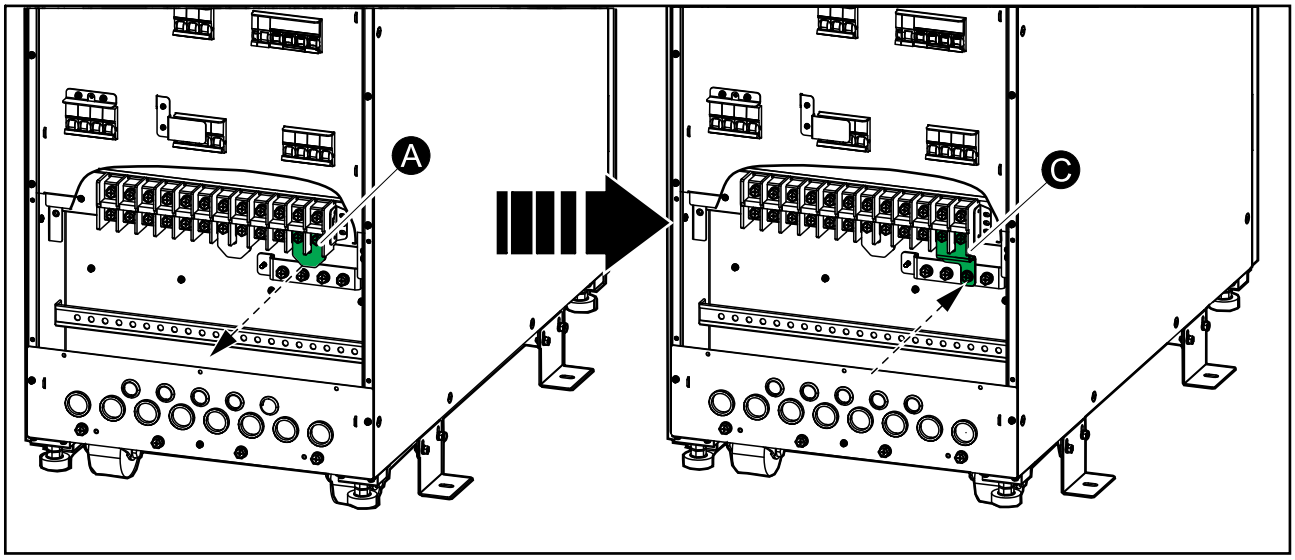
Rear View of 30 kVA 3:1 UPS



4. **In single mains systems**: Perform one of the following to prepare for the earthing system:

   – **For TN-C earthing system of 3:1 UPS**: Remove the right V-shaped jumper (Neutral) (marked (A) in the illustration) from the terminal blocks. Install the provided Y-shaped jumper (marked (C) in the illustration) in the same position. The Y-shaped jumper is provided in the paper bag attached to the installation manual.

Rear View of 30 kVA 3:1 UPS

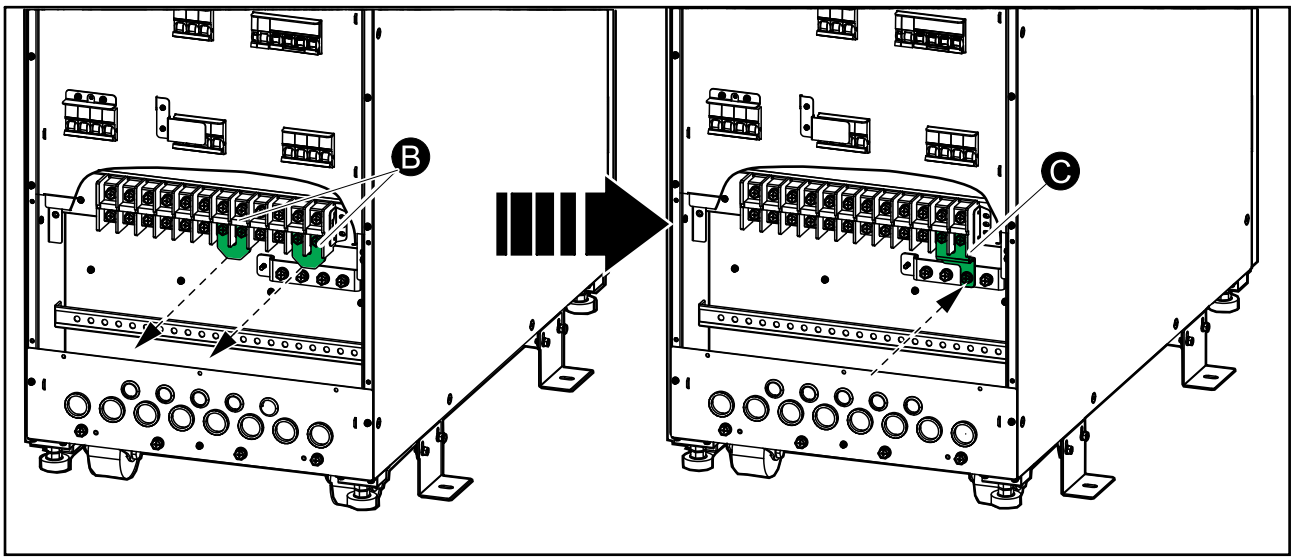


   – **For non TN-C earthing system of 3:1 UPS**: No action is needed to prepare for the earthing system.

5. **In dual mains systems**: Perform one of the following to prepare for the earthing system:

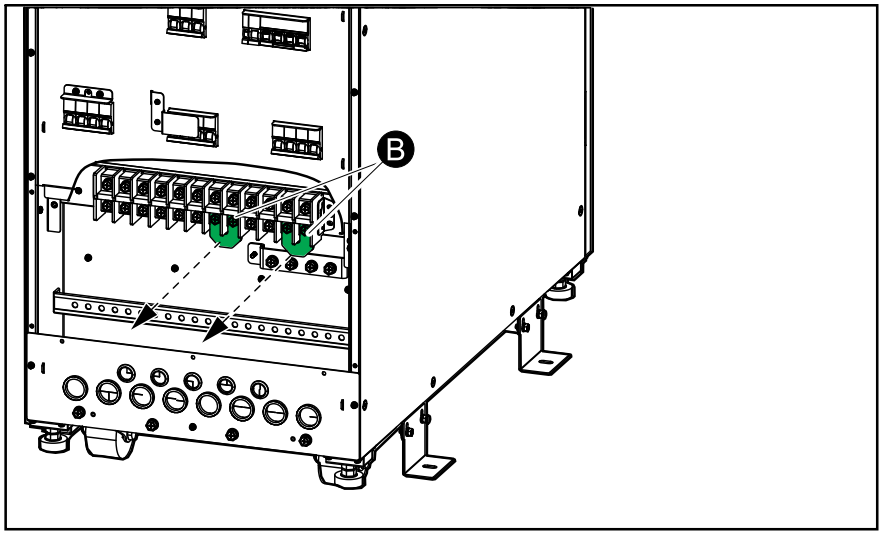
   – **For TN-C earthing system of 3:1 UPS**: Remove the two V-shaped jumpers (marked (B) in the illustration) from the terminal blocks. Install the provided Lshaped jumper (marked (C) in the illustration) in the indicated position in the terminal blocks. The Y-shaped jumper is provided in the paper bag attached with the installation manual.

Rear View of 30 kVA 3:1 UPS – TN-C Earthing System (Dual Mains)



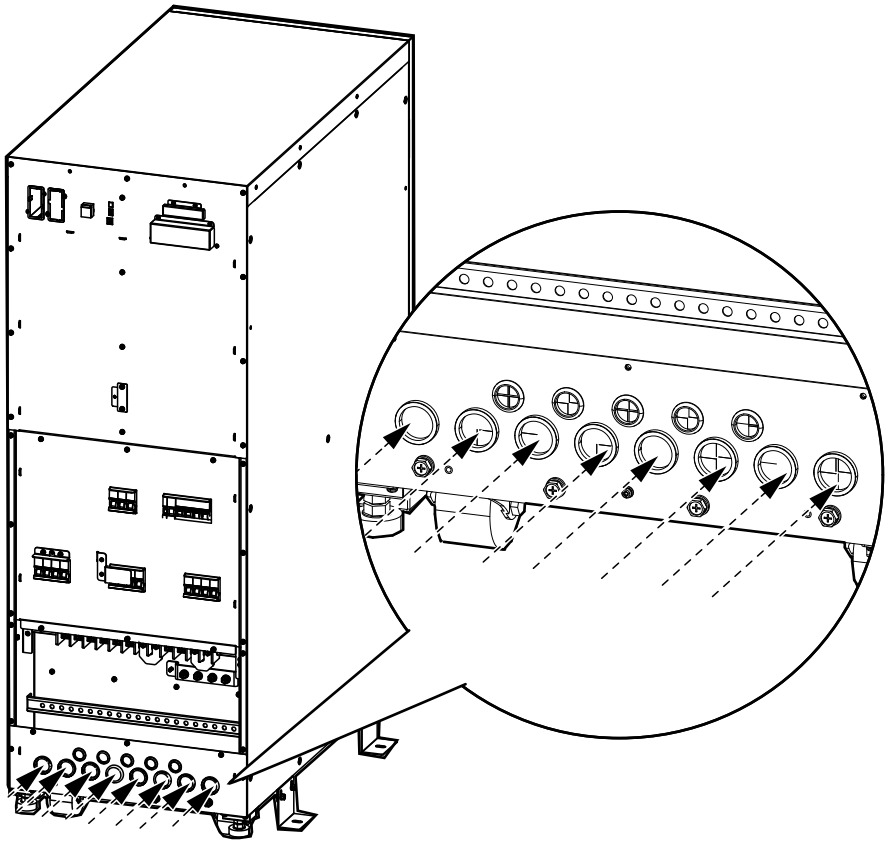
   – **For non TN-C earthing system**: Remove the two V-shaped jumpers (marked (B) in the illustration) from the terminal blocks.

Rear View of 30 kVA 3:1 UPS – Non TN-C Earthing System (Dual Mains)

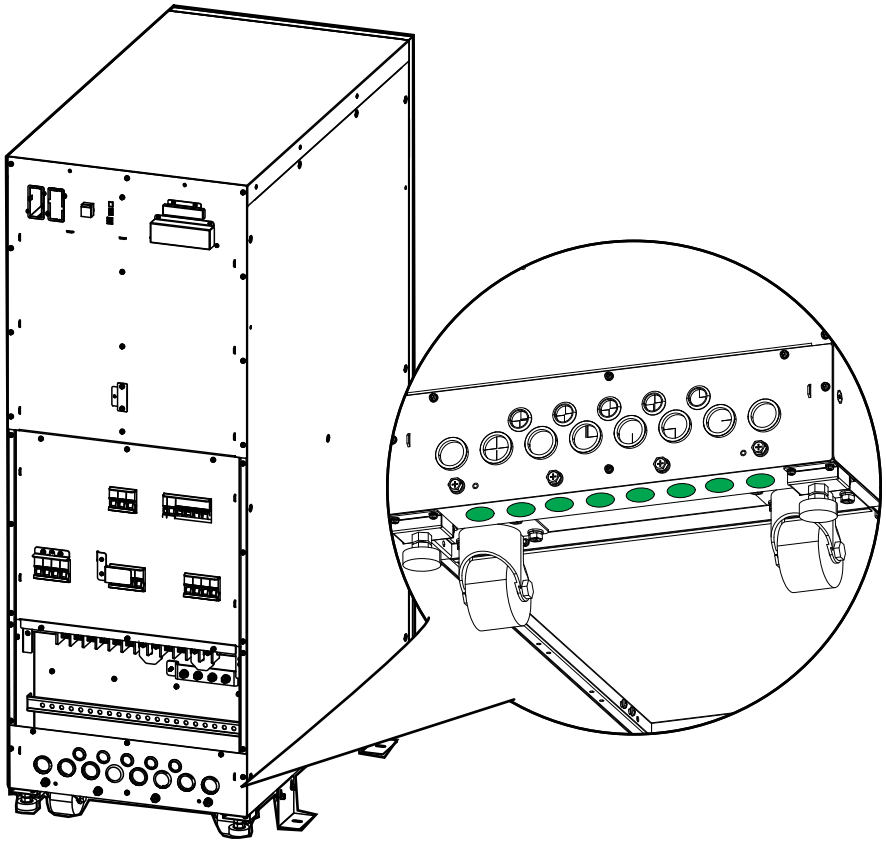


6. Cut holes on the cable brush plate. Remove the rear or bottom knock out holes based on cable entry route.

Rear View of 30 kVA 3:1 UPS (Rear Entry Cables)



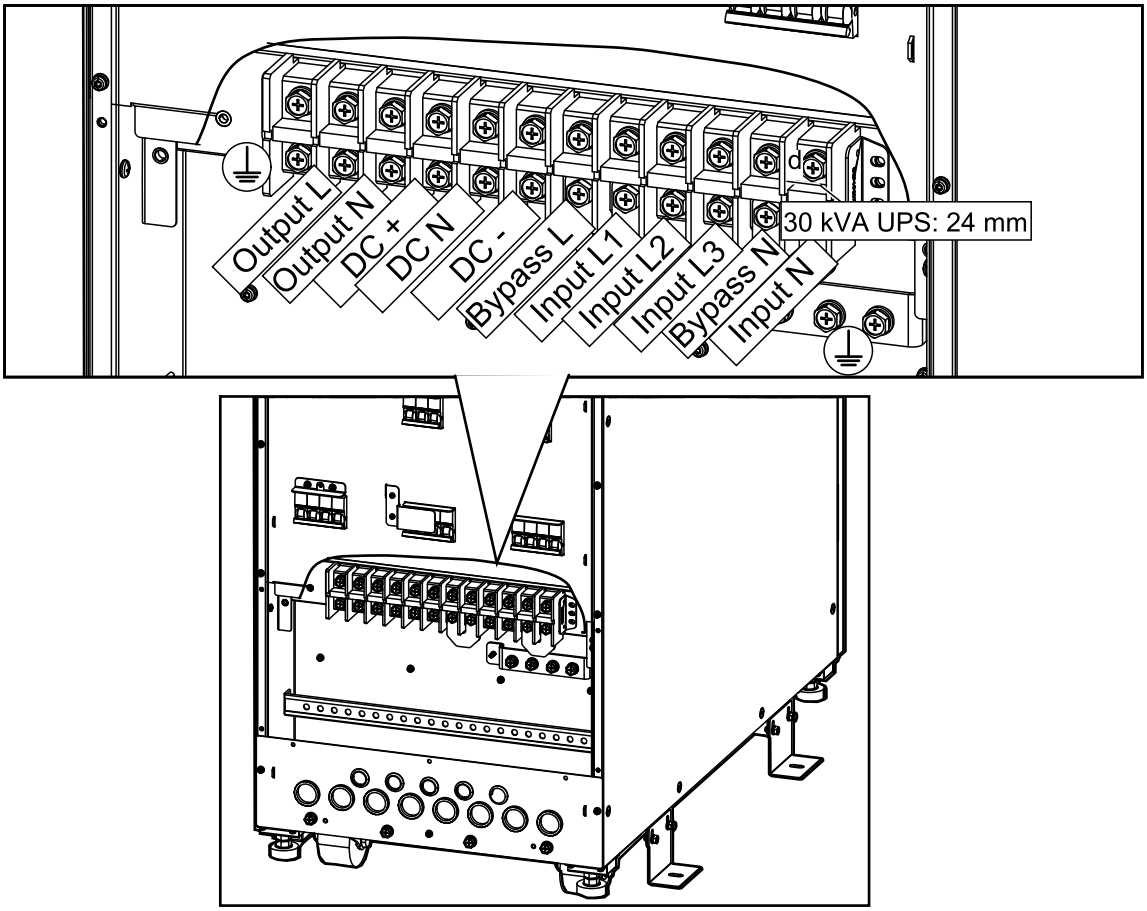
Rear View of 30 kVA 3:1 UPS (Bottom Entry Cables)



7. Route the power cables through the conduit box.

8. Connect the PE cable to the PE terminals.

Rear View of 30 kVA 3:1 UPS

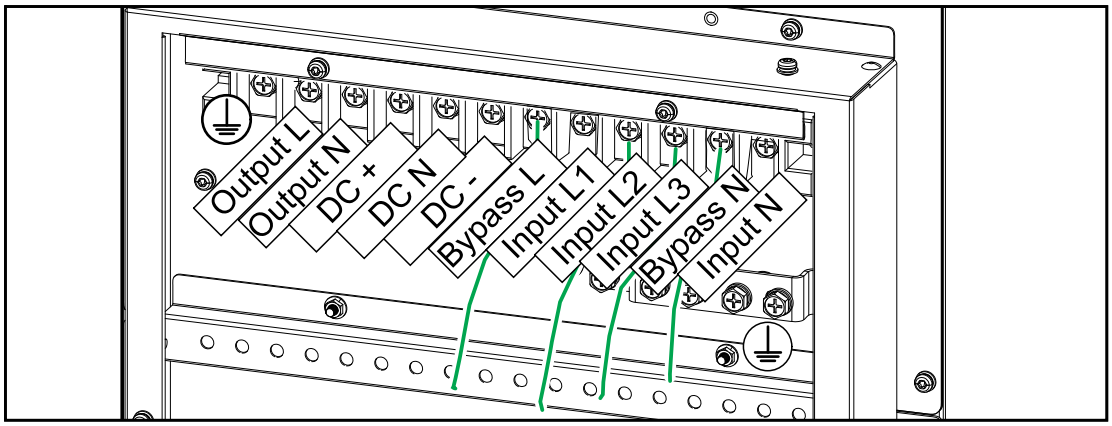


9. Connect the battery cables (+, N, -).

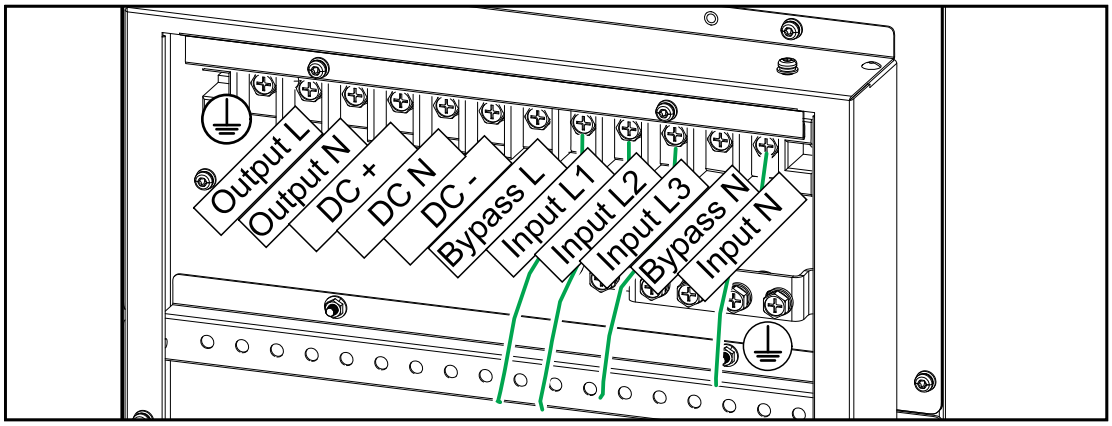
10. Connect the input cables (L1, L2, L3, N).

    NOTE: For single mains, input L1 and input N must be connected to the bypass L and bypass N.

Rear View of 30 kVA 3:1 UPS (Single Mains)



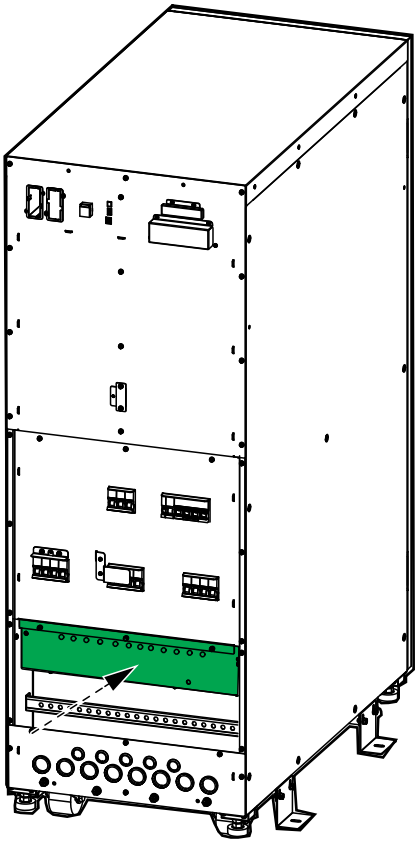
Rear View of 30 kVA 3:1 UPS (Dual Mains)



11. Connect the output cables (L, N).
12. **For dual mains system only**: Connect the bypass cables (L, N).

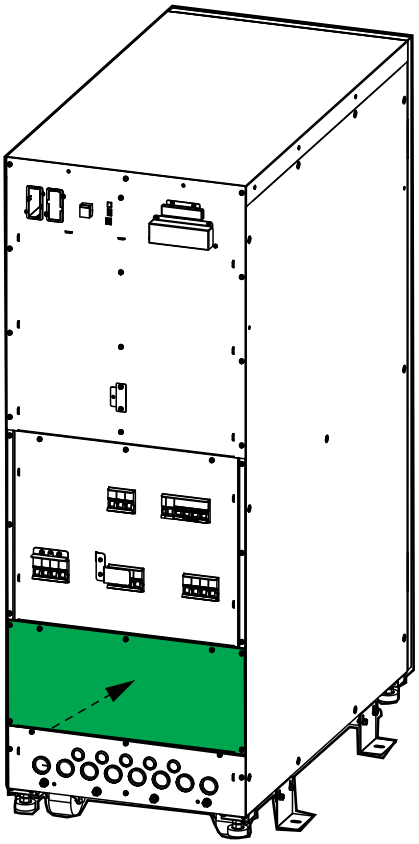
13. Reinstall the transparent protective cover over the terminal blocks.

Rear View of 30 kVA 3:1 UPS



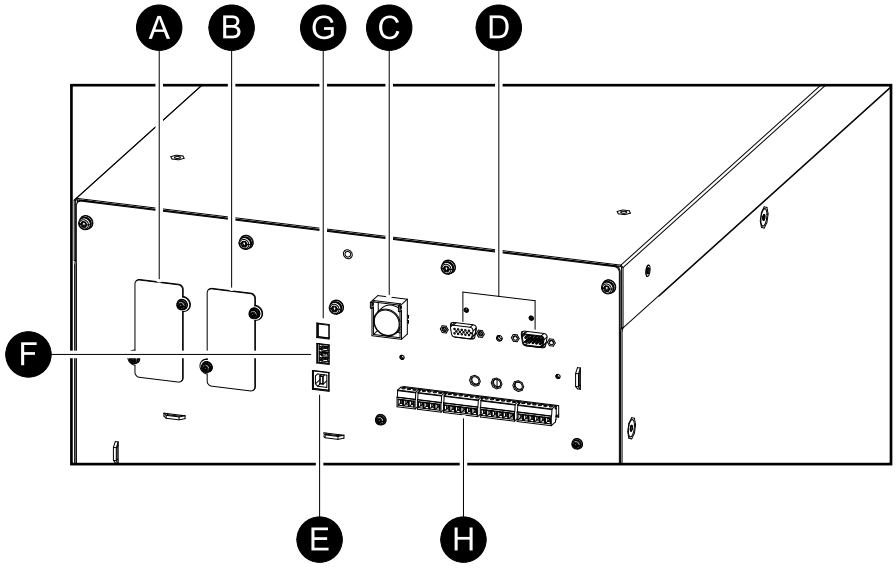
14. Reinstall the conduit box cover.

Rear View of 30 kVA 3:1 UPS

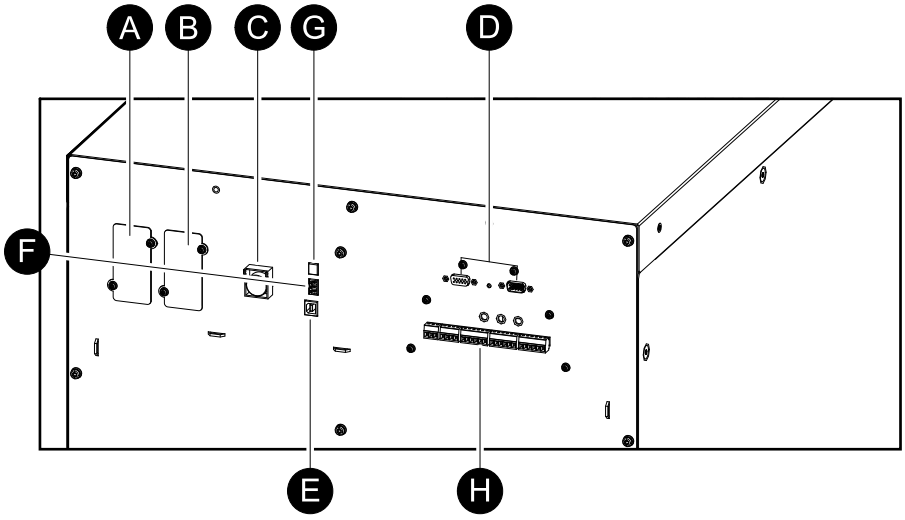


Connect the Signal Cables

Overview of Signal Connection Terminals in the 10-20 kVA UPS



Overview of Signal Connection Terminals in the 30-40 kVA UPS



A. Slot for network management card (NMC)
B. Slot for optional dry contacts card
C. Cold start button (optional)
D. Parallel connection ports
E. USB port (for service)
F. RS485 port
G. CAN
H. Input contacts and output relays (dry contacts)

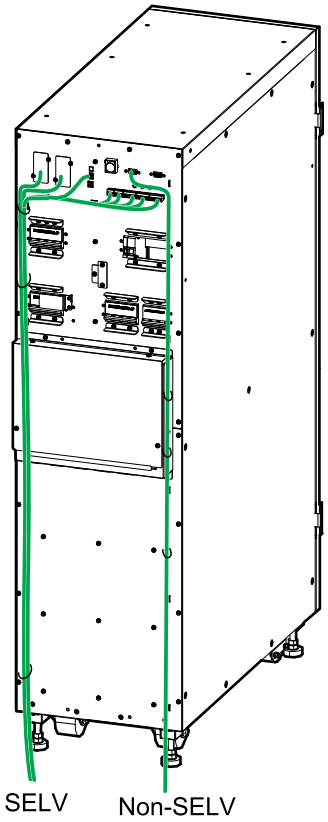
NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables (A, B, E, F, G, H) separately from the non-Class 2/non-SELV cables. Non-Class 2/non-SELV cables (D) should be rated for 300 V.

NOTE: The recommended cable size for the signal cables is 0.5 mm^2.

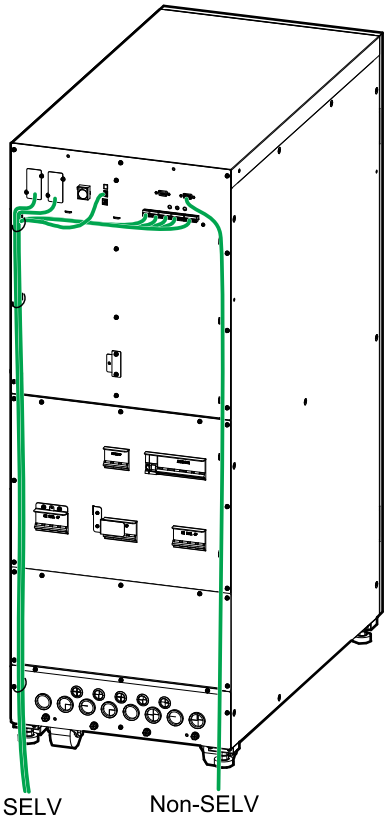
NOTE: The maximum length for Modbus cables is 80 m.

NOTE: Please refer to the following illustrations for the SELV and non-SELV cable routing.

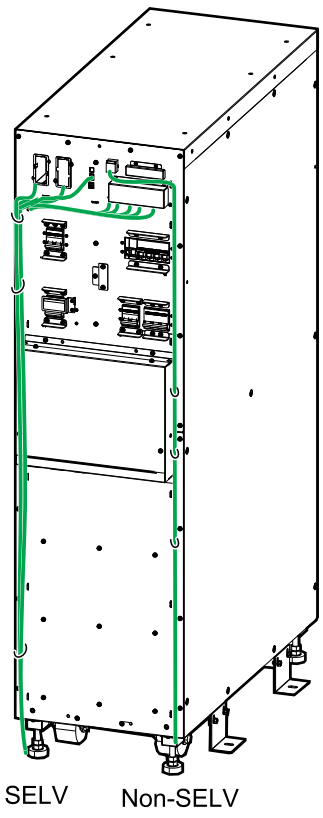
SELV and Non-SELV Cable Routing for 10 - 20 kVA 3:3 UPS



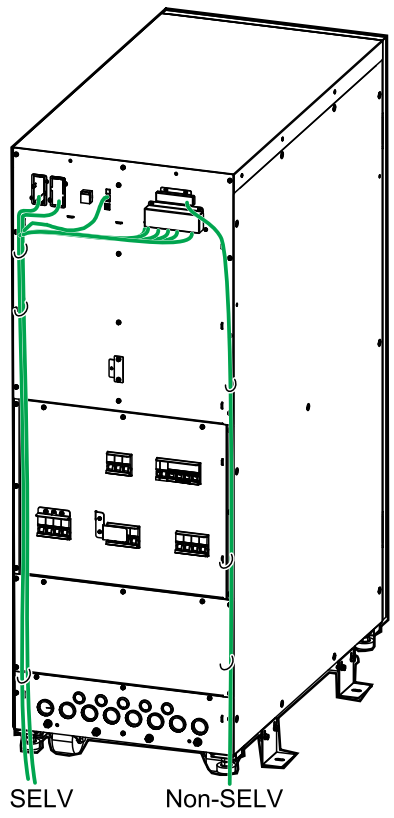
SELV and Non-SELV Cable Routing for 30 - 40 kVA 3:3 UPS



SELV and Non-SELV Cable Routing for 10 - 20 kVA 3:1 UPS



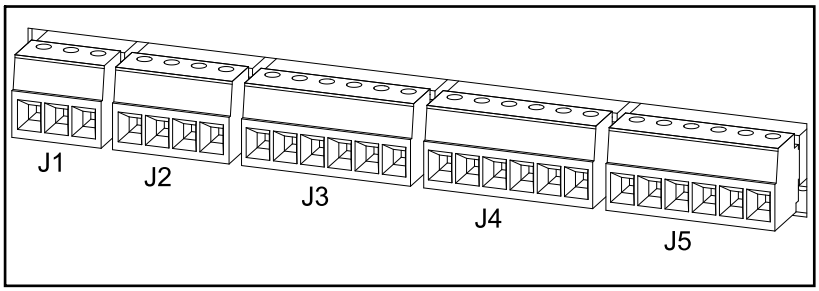
SELV and Non-SELV Cable Routing for 30 kVA 3:1 UPS

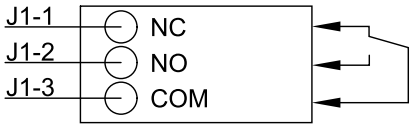
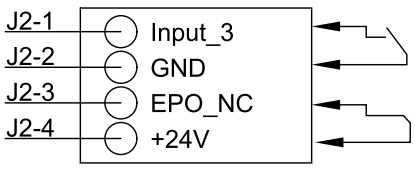
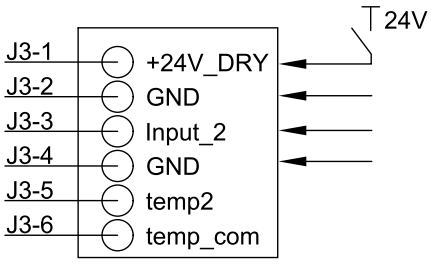


Connect the Signal Cables to the Input Contacts and Output Relays

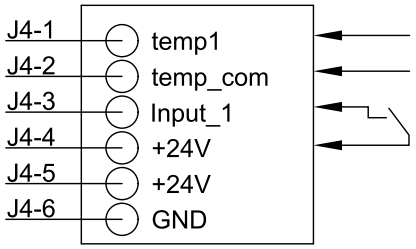
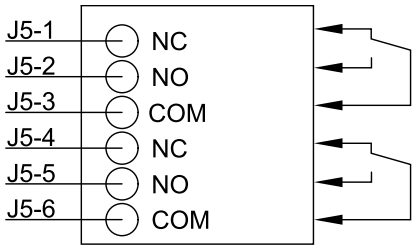
1. Connect the Class 2/SELV signal cables from the building EPO to terminal J2-3 and J2-4 in the UPS. The EPO circuit is considered Class 2/SELV. Class 2/SELV circuits must be isolated from the primary circuitry. Do not connect any circuit to the EPO terminal block unless it can be confirmed that the circuit is Class 2/SELV.
2. Connect the Class 2/SELV signal cables to the input contacts and output relays in the UPS. Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.
3. Connect the signal cables from the auxiliary products to the UPS. Follow the instructions in the auxiliary product manuals.

Terminals for Input Contacts and Output Relays



Terminal	Function		Diagram
J1-1	Configurable output (30 VDC / 3 A)	NC	
J1-2		NO	
J1-3		COM	
J2-1	Configurable input (24 VDC / 1 mA)	Input_3	
J2-2		GND	
J2-3	EPO normally closed (24 VDC / 1 mA)	EPO NC	
J2-4		+24 V	
J3-1	Configurable output (24 VDC / 400 mA)	+24_DRY	
J3-2		GND	
J3-3	Configurable input[46] (24 VDC / 1 mA)	Input_2	
J3-4		GND	
J3-5	Ambient temperature signal[47]	Temp 2	
J3-6		Temp_COM	

(46) For E3SP10KHB, E3SP15KHB, E3SP20KHB, E3SP30KHB, E3SP40KHB, E3SP10K3IB, E3SP15K3IB, E3SP20K3IB, or E3SP30K3IB, the default function for J3-3 is UIB open.
(47) Can be configured as battery temperature sensor via the UPS display.

Terminal	Function		Diagram
J4-1	External battery temperature signal(48)	Temp 1	
J4-2		Temp_COM	
J4-3	Configurable input / (24 VDC / 1 mA)	Input_1	
J4-4	— (24 VDC / 400 mA)	+24 V	
J4-5	— (24 VDC / 400 mA)	+24 V	
J4-6	—	GND	
J5-1	Configurable output (49) (30 VDC / 3 A)	NC	
J5-2		NO	
J5-3		COM	
J5-4	Bypass backfeed trip (30 VDC / 3 A)	NC	
J5-5		NO	
J5-6		COM	

(48) The battery temperature sensor is built-in for E3SP10KHB, E3SP15KHB, E3SP20KHB, E3SP30KHB, E3SP40KHB, E3SP10K3IB, E3SP15K3IB, E3SP20K3IB, or E3SP30K3IB.

(49) For E3SP10KHB, E3SP15KHB, E3SP20KHB, E3SP30KHB, E3SP40KHB, E3SP10K3IB, E3SP15K3IB, E3SP20K3IB, or E3SP30K3IB, the default function for J5-2 is **Main backfeed trip**.

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

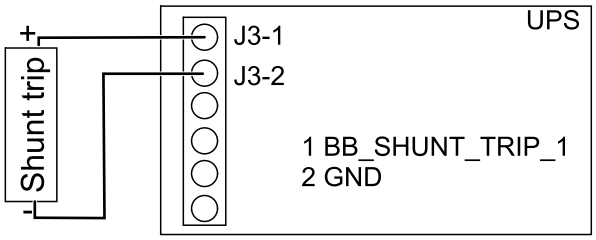
NOTE: Route the signal cables separately from the power cables and route the Class 2/SELV cables separately from the non-Class 2/non-SELV cables.

1. Connect the shunt trip signal cables from the battery disconnect device(s) in your battery solution to the UPS. Follow the illustration for connection with internal 24 VDC supply. The UPS can connect to and monitor one battery disconnect device.

   a. Connect the battery disconnect device to terminal J3 in the UPS.

      NOTE: The following diagram and table demonstrate the battery disconnect device trip connection with internal 24 VDC / 400 mA Max. supply and pin connections.

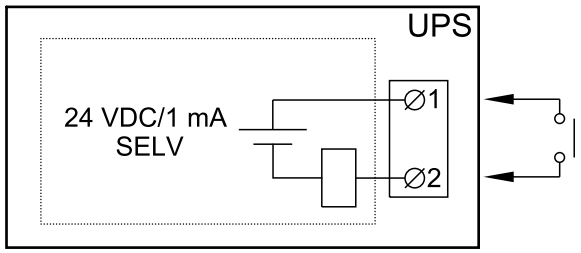
Battery Disconnect Device Trip Connection with Internal 24 VDC / 400 mA Max. Supply



J3 Pin Connections for Battery Disconnect Device

The cables shall be sized taking the cable voltage drop and the recommendation of the shunt trip manufacturer into consideration.

2. Connect signal cables from the auxiliary contacts in your switchgear to the UPS input contacts.



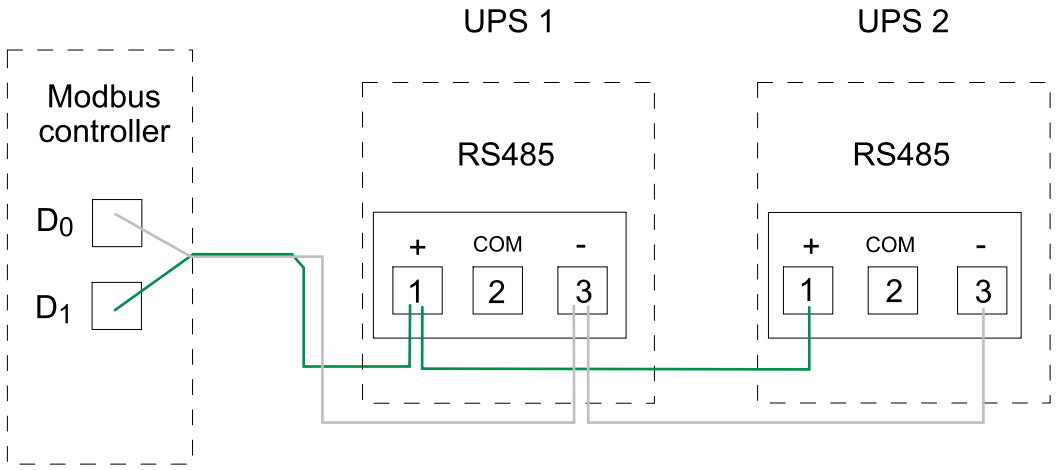
3. Configure the input contact as **BB status** and enable **BB present** via Tuner.

Connect the Modbus Cables

NOTE: For cyber security protection, strict access control to the installation room must be exerted at all times.

1. Connect the Modbus cables to the terminal RS485 of the UPS(s). Use a 2-wire connection.
   - All Modbus signal cables shall be double insulated/jacket cable and minimum rated for 30 VDC.
   - Wiring should be done in accordance with local wiring codes.
   - Route signal cables separately from power cables to ensure sufficient isolation.

2-Wire Connection with Two UPSs

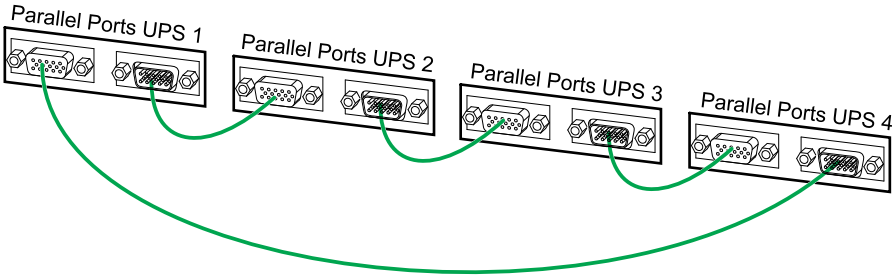


2. Install 150 Ohm termination resistors at each end of each bus if the buses are very long and operate at high data rates. Buses under 610 meters at 9600 baud or under 305 meters at 19200 baud should not require termination resistors.

Connect the Parallel Cables in Parallel Systems

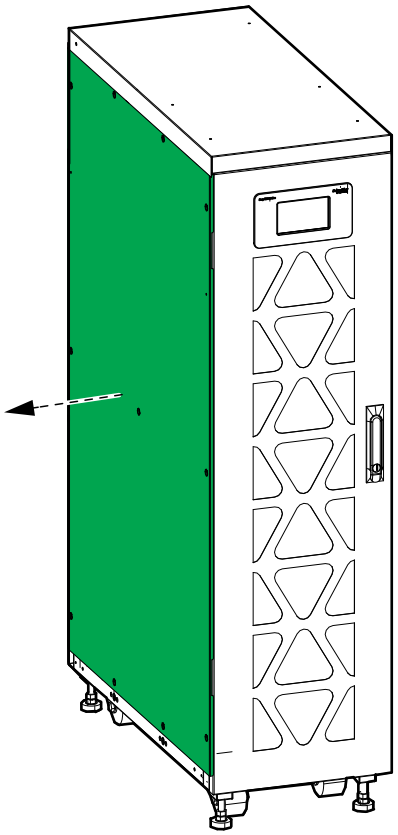
1. Connect the parallel cables (option kit) between all the UPSs of the parallel system.

Top View of the Parallel Board

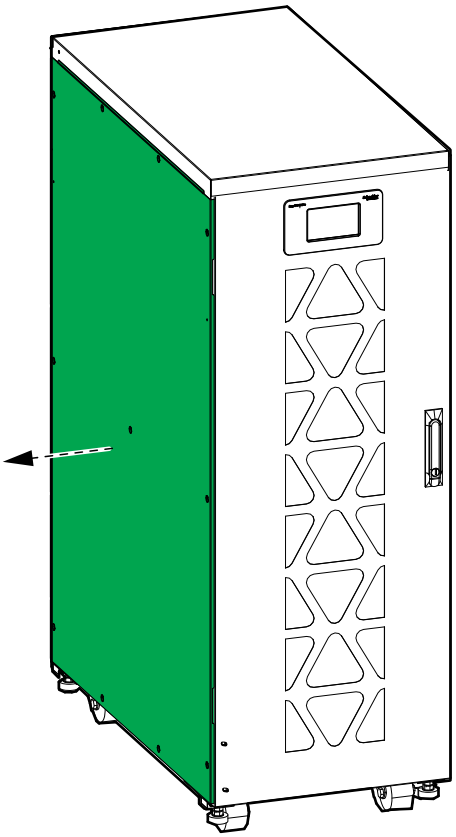


2. Remove the left panel from the UPS.

Front View of 10-20 kVA UPS

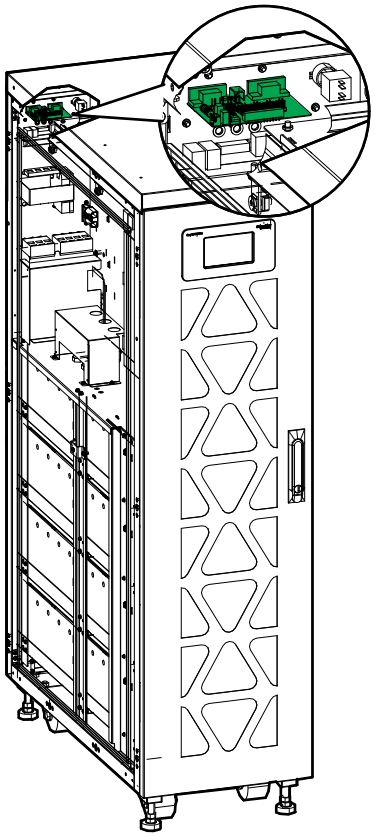


Front View of 30-40 kVA UPS

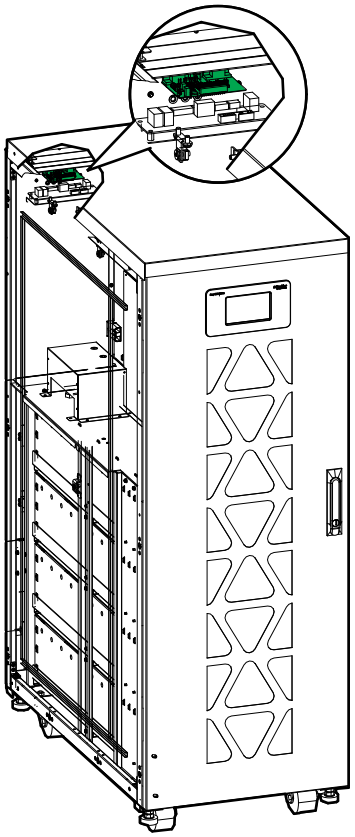


3. The parallel board is exposed.

Front View of 10-20 kVA UPS

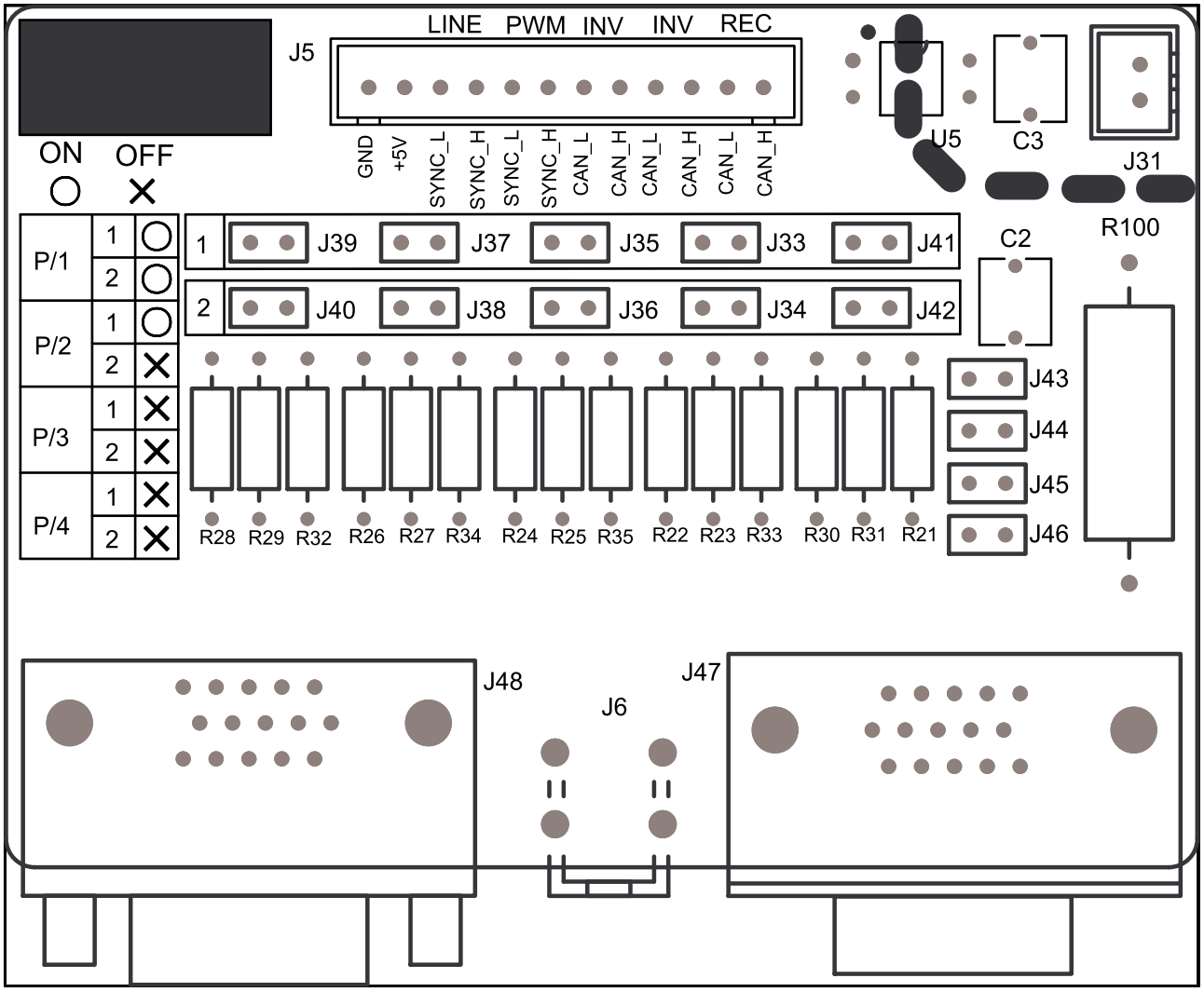


Front View of 30-40 kVA UPS



4. Remove the jumpers from the parallel board according to your system:
   - In parallel systems with two UPSs, remove the jumpers from J34, J36, J38, J40, J42 on both parallel boards.
   - In parallel systems with three or four UPSs, remove the jumpers from J33, J34, J35, J36, J37, J38, J39, J40, J41, J42 on all parallel boards.

Overview of the Parallel Board



5. Reinstall the left panel on the UPS.

Install Batteries in the UPS

⚠⚠WARNING

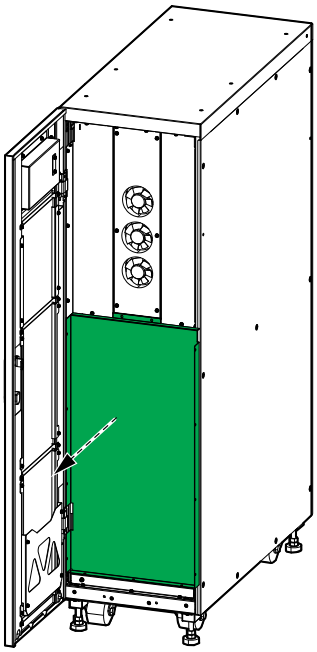
HAZARD OF ARC FLASH

Be careful not to damage the battery cables when installing the battery modules. Lift the battery cables away from the battery shelves before pushing the battery modules into the cabinet.

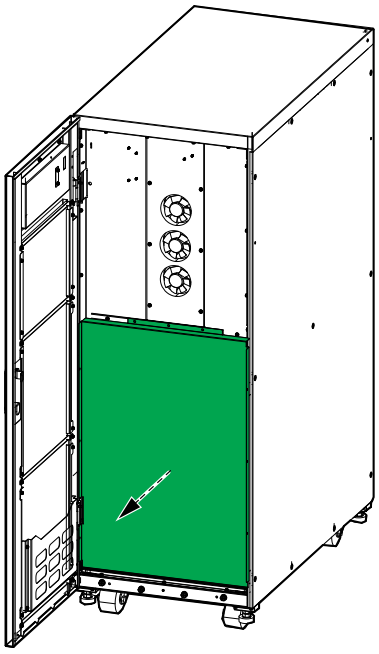
Failure to follow these instructions can result in death, serious injury, or equipment damage.

1. Remove the plate in front of the battery shelves.

Front View of the 10-20 kVA UPS



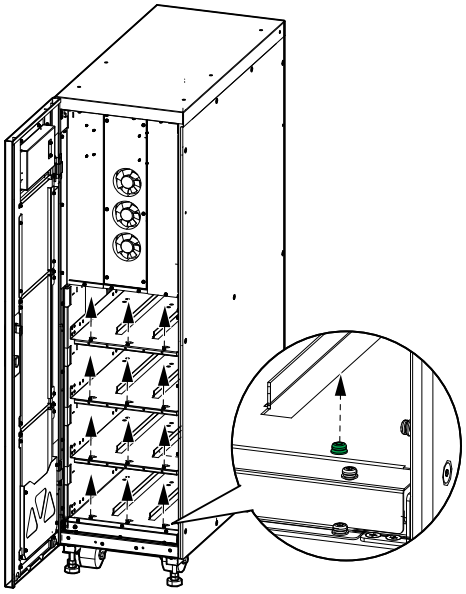
Front View of the 30-40 kVA UPS



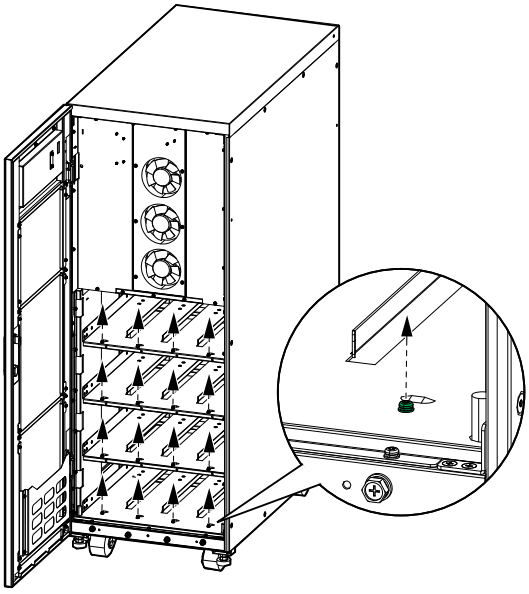
2. Cut the cable ties that hold the battery cables to the frame.

3. Remove the M5 screw before placing the battery module onto the shelves. Save the M5 screw for future use.

Front View of the 10-20 kVA UPS



Front View of the 30-40 kVA UPS



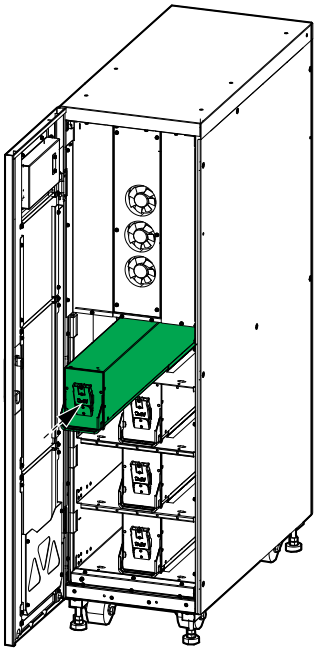
4. Holding the handle, slide the battery modules into the slot on the shelf one string at a time from the bottom and up.

   NOTE: The battery strings are vertical. If the 10-20 kVA UPS contains one battery string, the batteries should be placed in the middle. If the 10-20 kVA UPS contains two battery strings, the batteries should be installed in the left and right sides to increase weight stability.

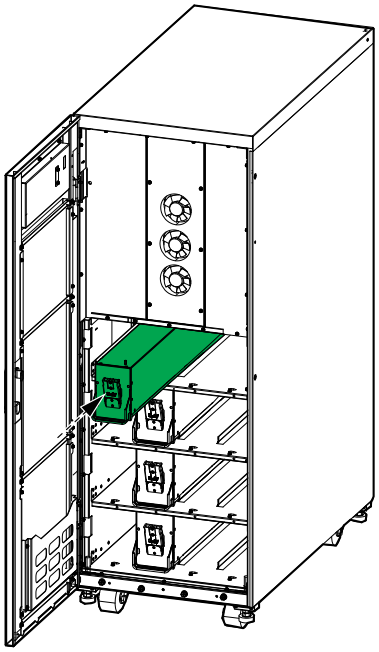
   NOTE: Be careful not to damage the battery cables when installing the battery module.

⚠CAUTION
HEAVY LOAD Battery modules are heavy and require two persons to lift. • The battery module weighs 30 kg. **Failure to follow these instructions can result in injury or equipment damage.**

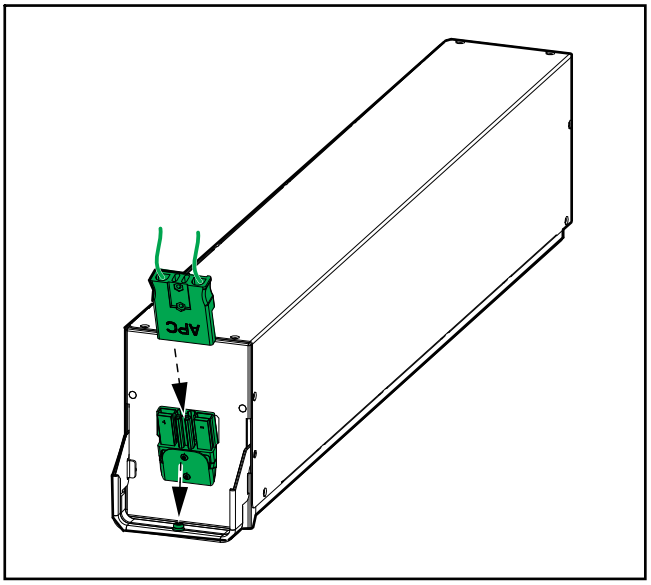
Front View of the 10-20 kVA UPS with One Battery String



Front View of the 30-40 kVA UPS with One Battery String



5. Push down the handle of each battery module and fasten the handle to the shelf with the provided M5 screw which was removed in step 3.



6. Remove the shrink tubes from the power terminals and connect the power terminals to the batteries.
7. Fix the cables with cable ties. Reinstall the plate in front of the battery shelves.

Backfeed Protection

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

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

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

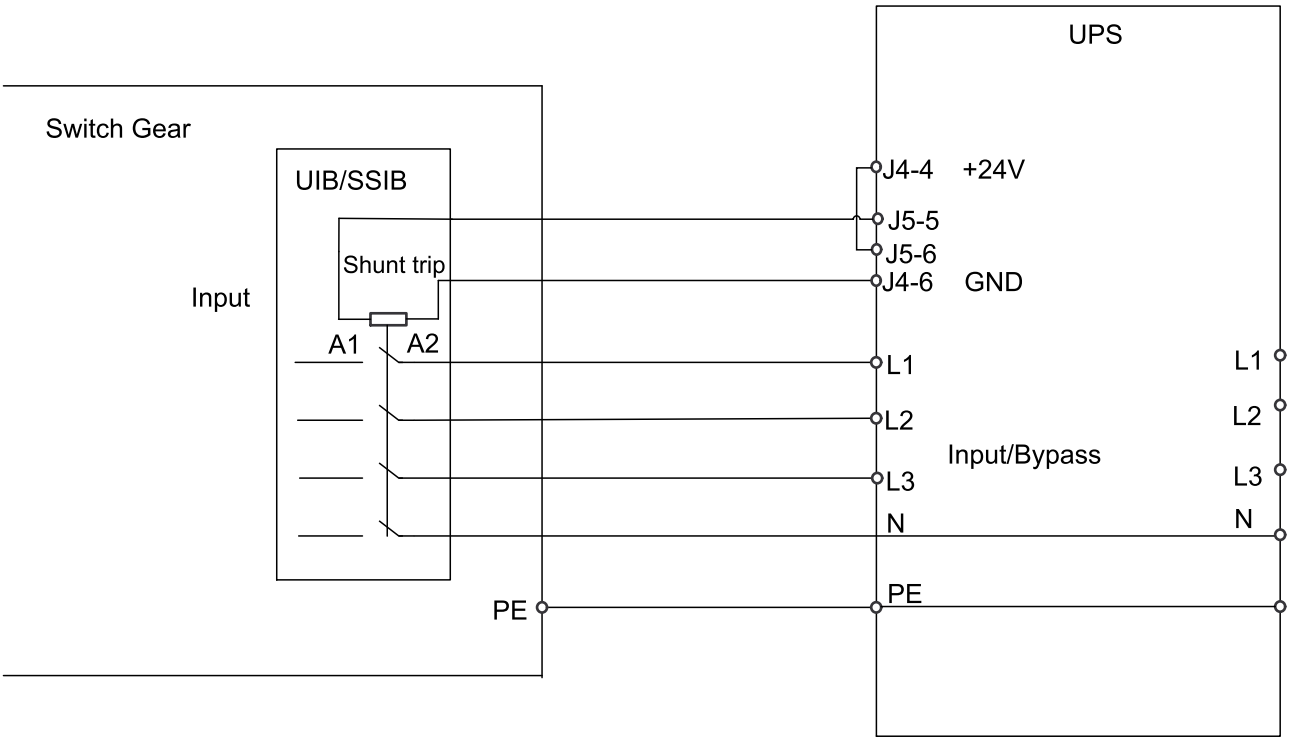
Failure to follow these instructions will result in death or serious injury.

An additional external isolation device must be installed in the UPS system. A magnetic contactor or a disconnect device with shunt trip functionality can be used for this purpose.

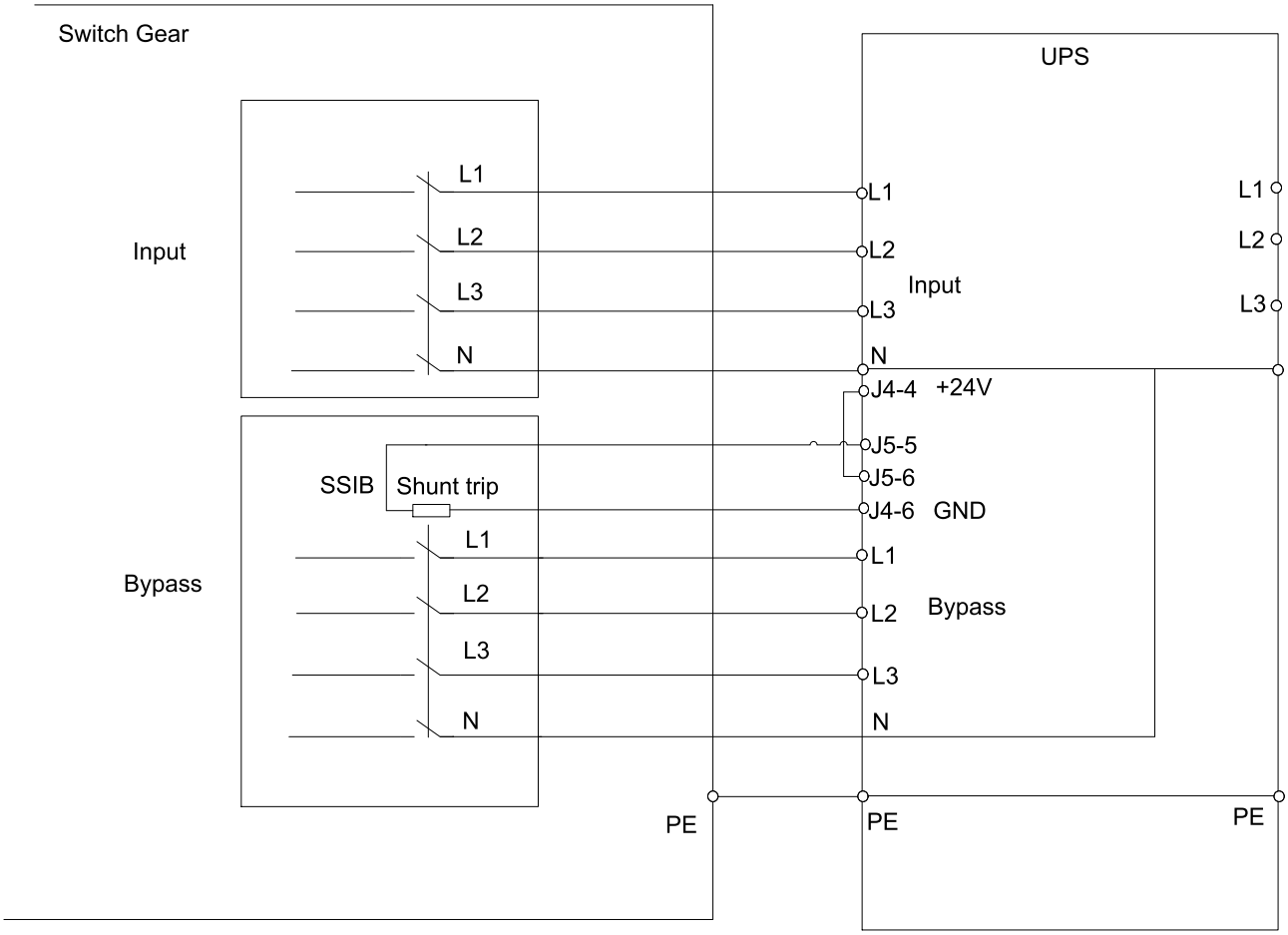
The isolation device must be able to withstand the electrical characteristics as described in Specifications, page 15.

NOTE: Shunt trip coil can be supplied by external 24 V DC source or by UPS itself as shown in the following diagrams. Connect J4-4 to J5-6 to provide 24 V source for the shunt trip coil from the UPS. For dual mains, the UPS includes built-in backfeed protection on input.

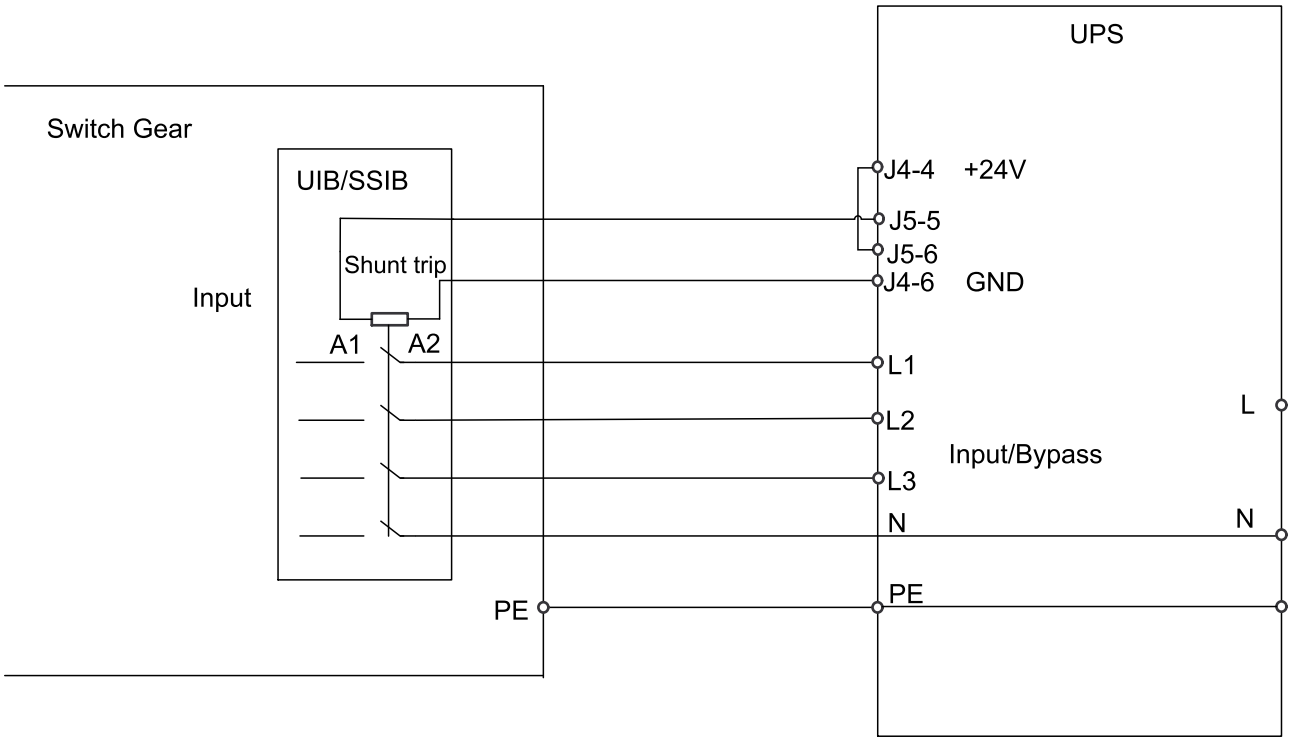
Single Mains with External Backfeed Breaker for 3:3 UPS



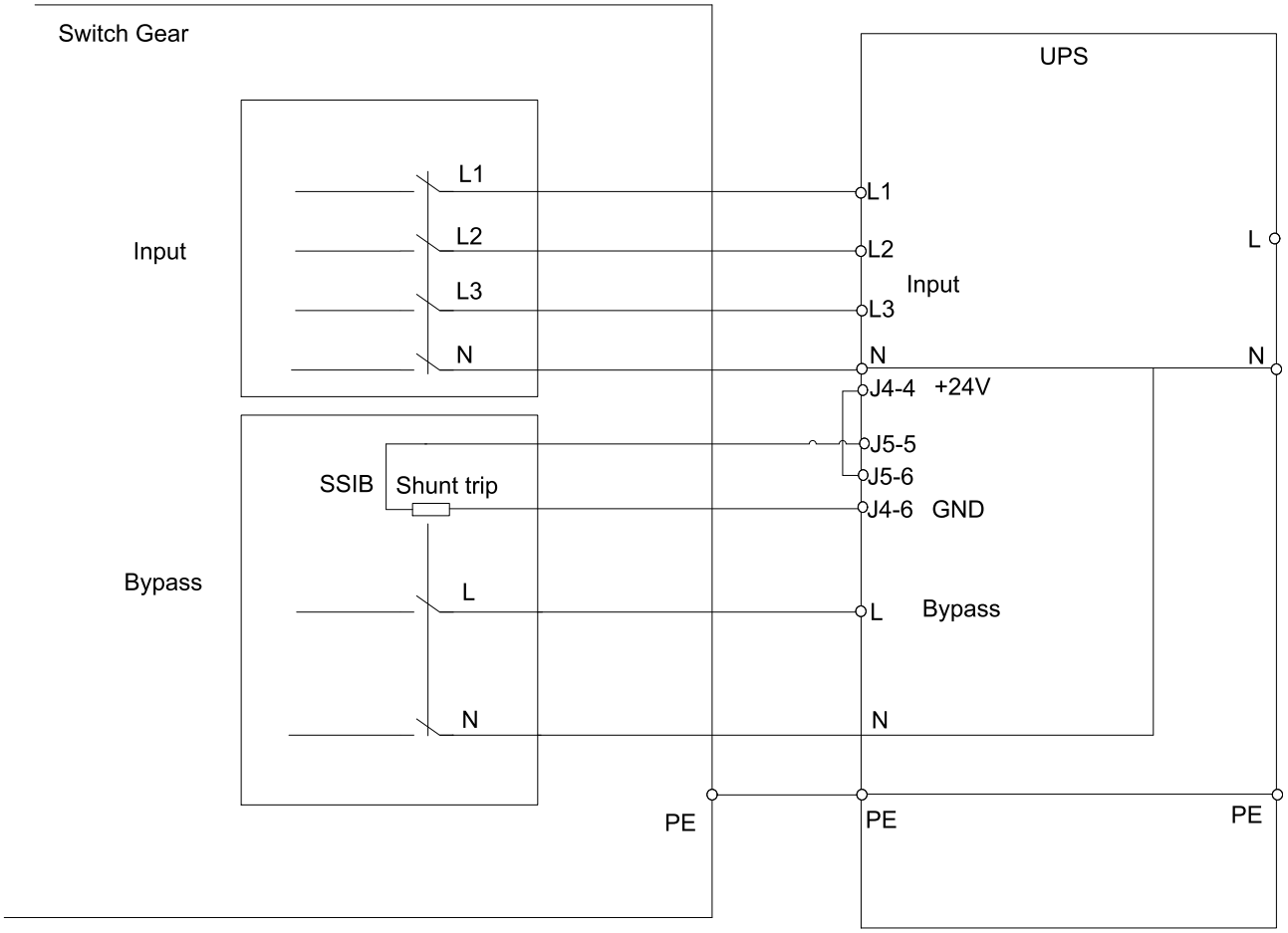
Dual Mains with External Backfeed Breaker for 3:3 UPS



Single Mains with Backfeed Breaker for 3:1 UPS



Dual Mains with Backfeed Breaker for 3:1 UPS

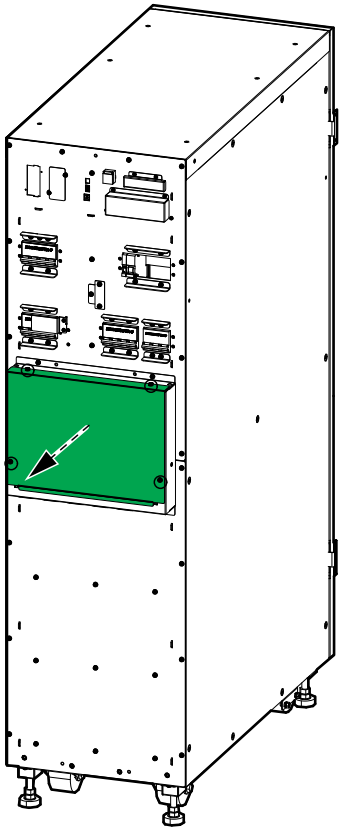


Decommission or Move the UPS to a New Location

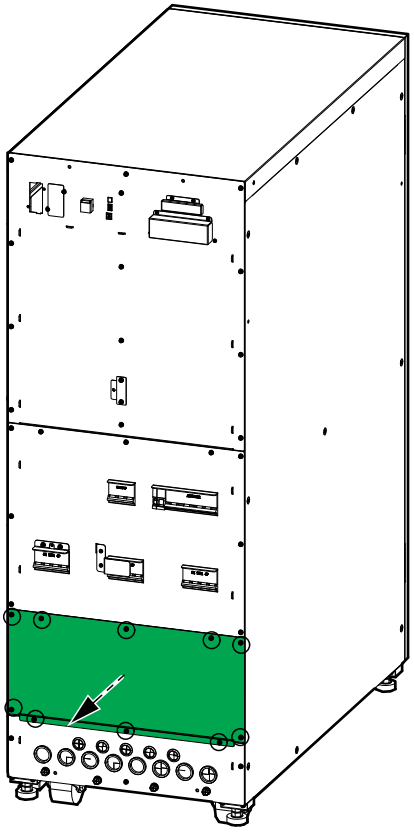
1. Shut down the UPS completely – follow the instructions in the UPS operation manual.
2. Lockout/Tagout all disconnect devices on the UPS in the OFF (open) position.
3. Lockout/Tagout all disconnect devices in the switchgear in the OFF (open) position.
4. Lockout/Tagout all battery disconnect devices in the switchgear/battery solution in the OFF (open) position.

5. Remove the conduit box cover. Save it for reinstallation.

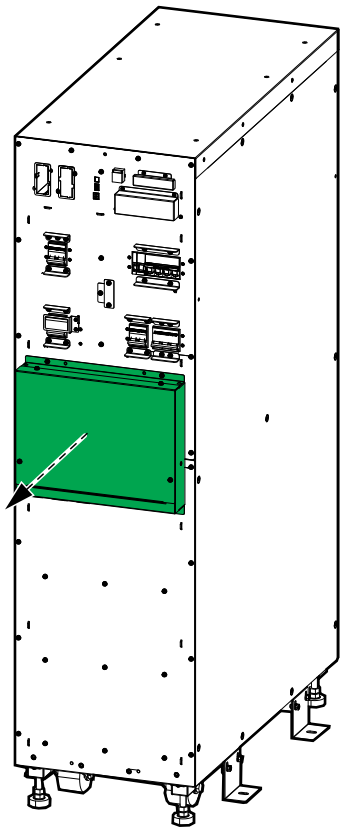
Rear View of 10-20 kVA 3:3 UPS



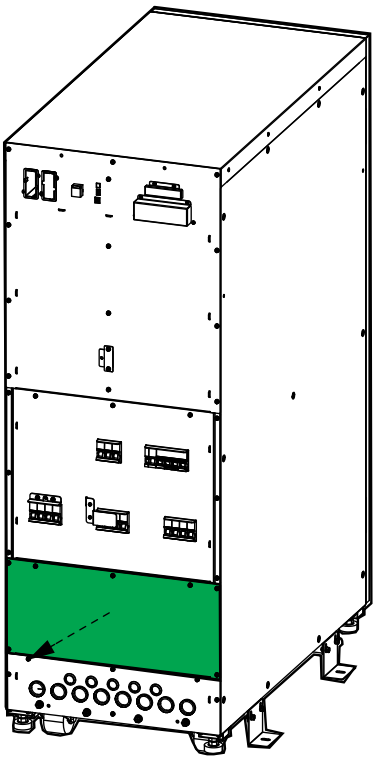
Rear View of 30-40 kVA 3:3 UPS



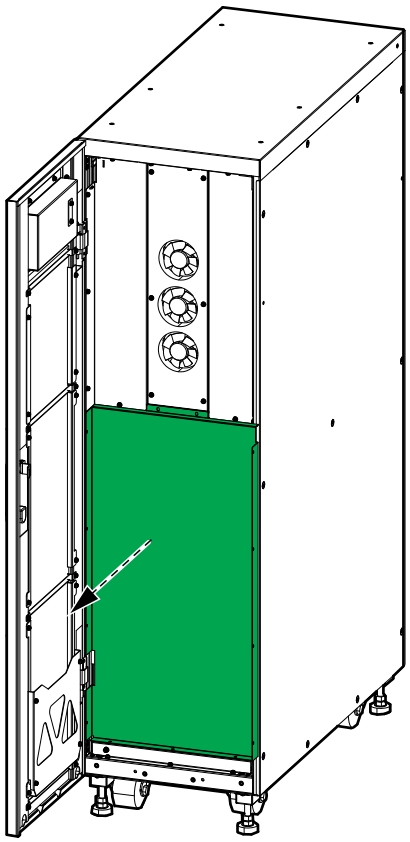
Rear View of 10-20 kVA 3:1 UPS



Rear View of 30 kVA 3:1 UPS



6. Remove the battery cover.



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

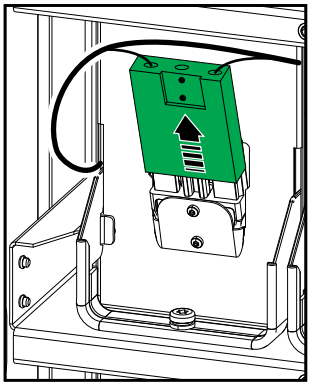
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

- Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.
- Do not dispose of batteries in a fire as they can explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Set the battery disconnect device BB to the open (OFF) position before starting this procedure.

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



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

⚠CAUTION

HEAVY LOAD

Battery modules are heavy and require two persons to lift.

- The battery module weighs 30 kg.

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

a. Remove the screw from the battery module handle and turn the handle upwards.

b. Pull the battery module carefully out of the slot.

c. Save the battery modules for reinstallation.

⚠WARNING

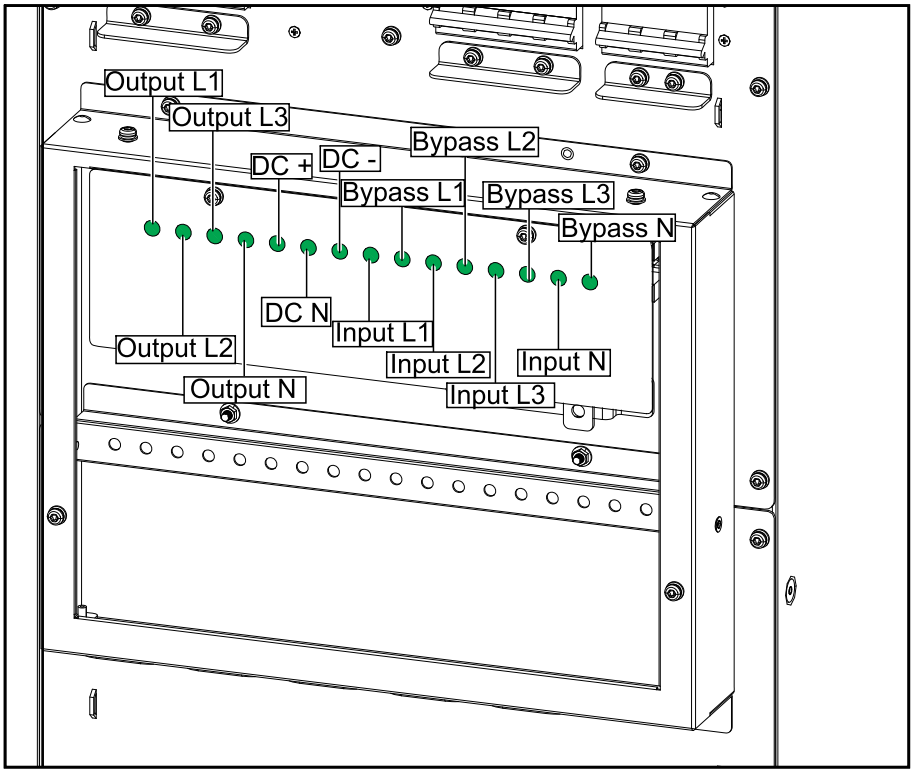
RISK OF EQUIPMENT DAMAGE

- If the UPS system remains de-energized for a long period, we recommend that you energize the UPS system for a period of 24 hours at least once every month. This charges the installed battery modules, thus avoiding irreversible damage from deep discharging.
- Store the battery modules at an ambient temperature of -15 to 40 ° C.
- Store the battery modules in their original protective packaging.
- Battery modules stored at -15 to 25 °C must be recharged every six months to avoid damages from deep discharging. Battery modules stored at over 25 °C must be recharged at shorter intervals.

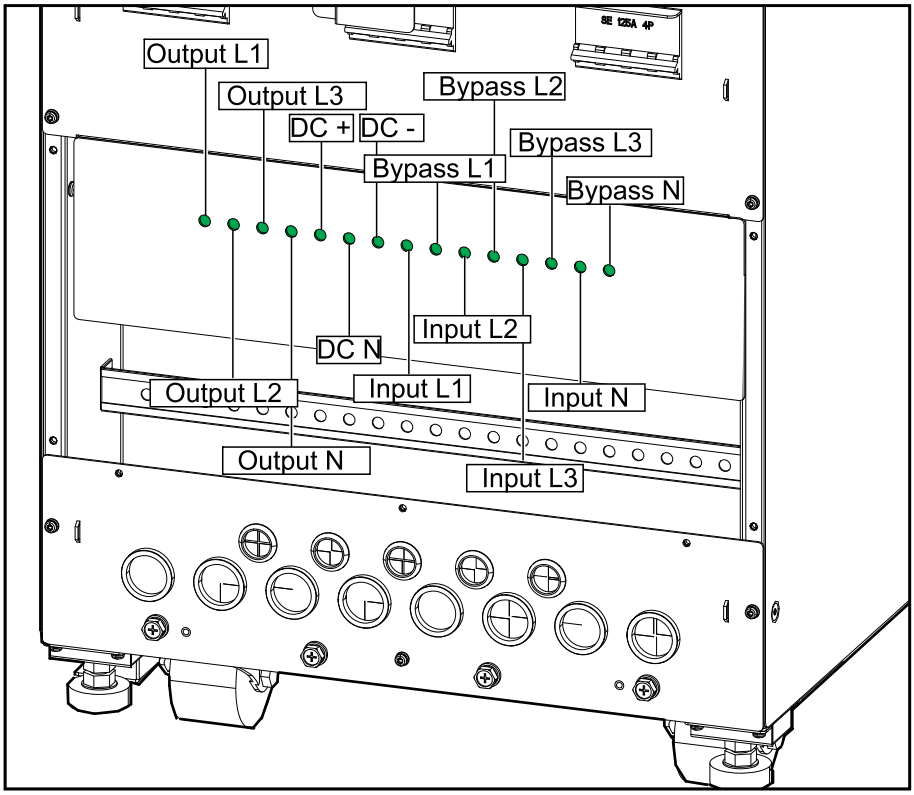
Failure to follow these instructions can result in death, serious injury, or equipment damage.

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

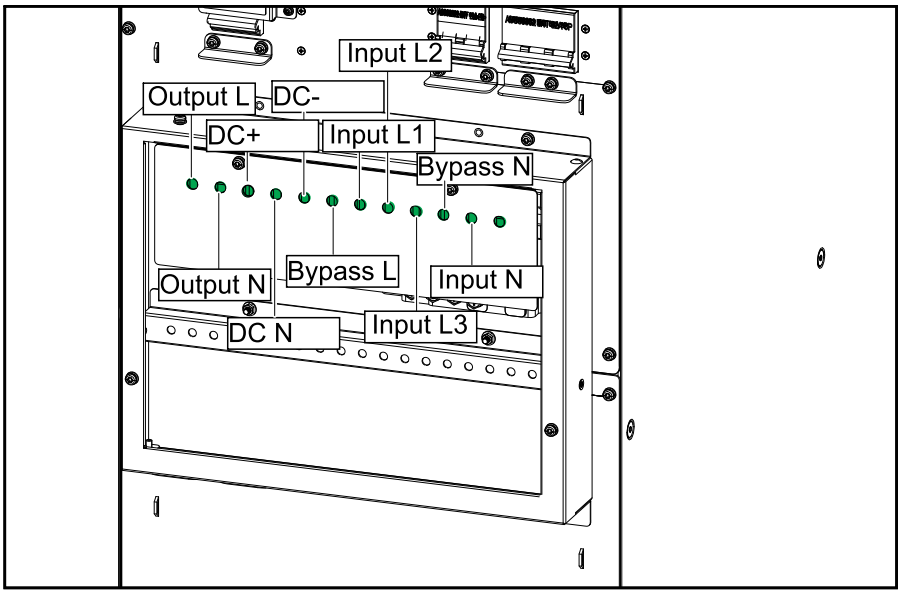
Rear View of 10-20 kVA 3:3 UPS



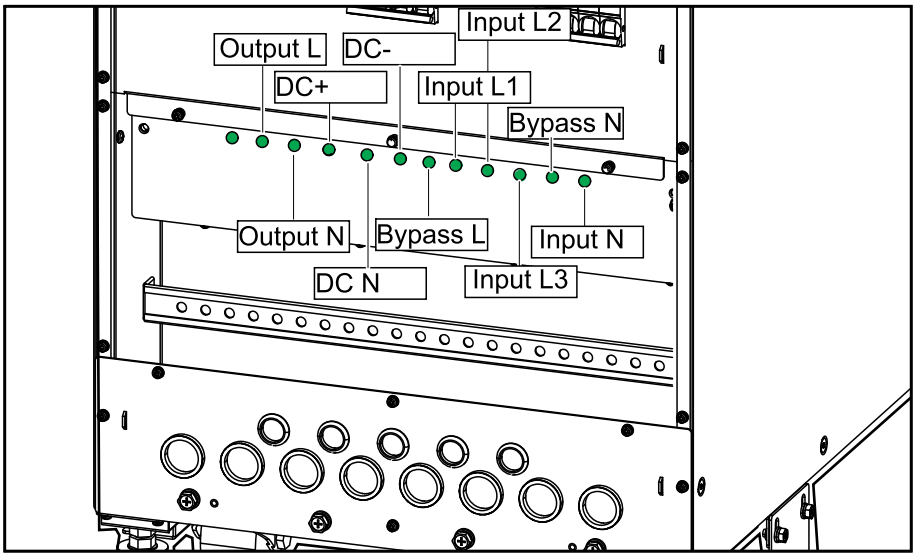
Rear View of 30-40 kVA 3:3 UPS



Rear View of 10-20 kVA 3:1 UPS



Rear View of 30 kVA 3:1 UPS



10. Remove the transparent protective cover from the terminal blocks.

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

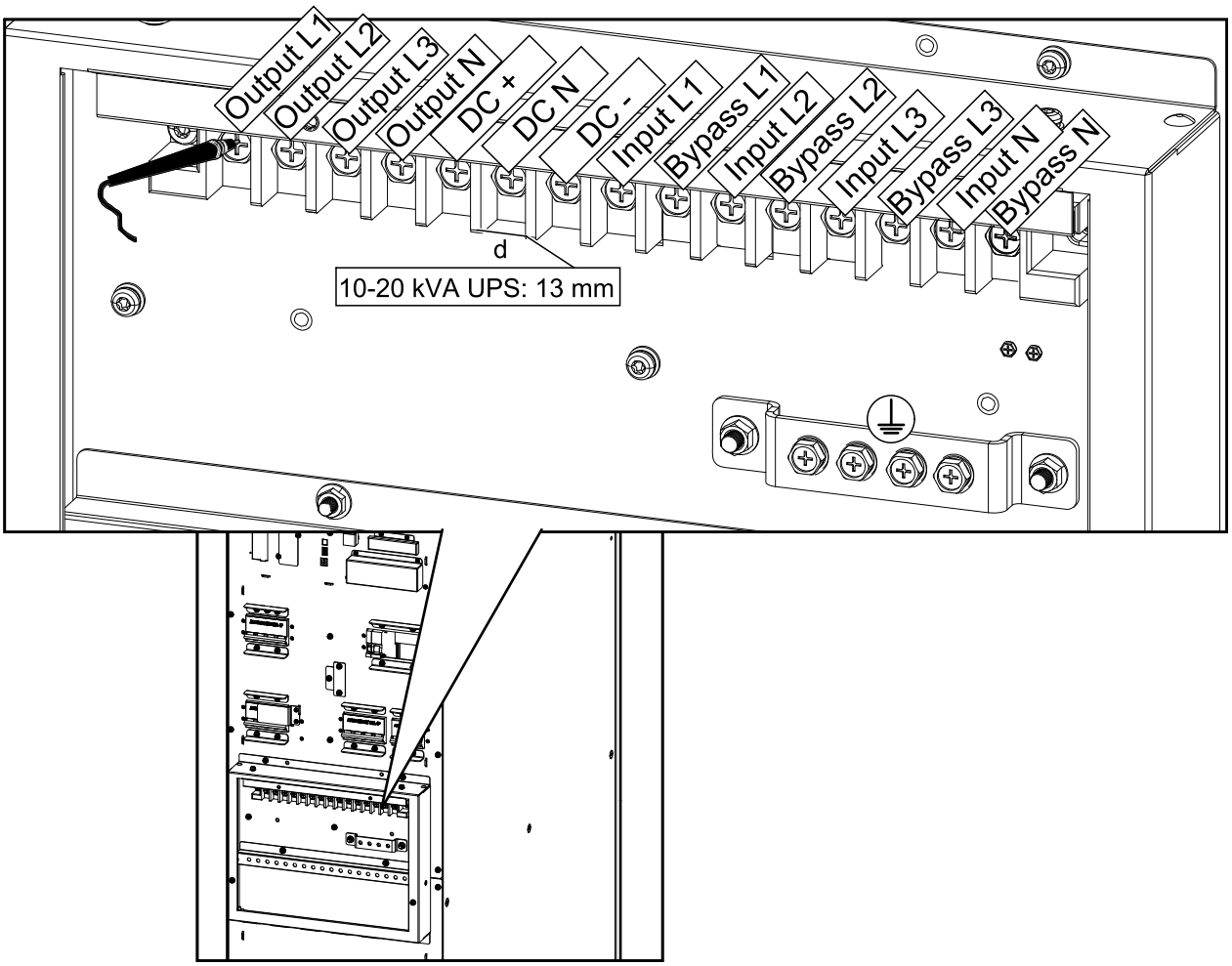
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

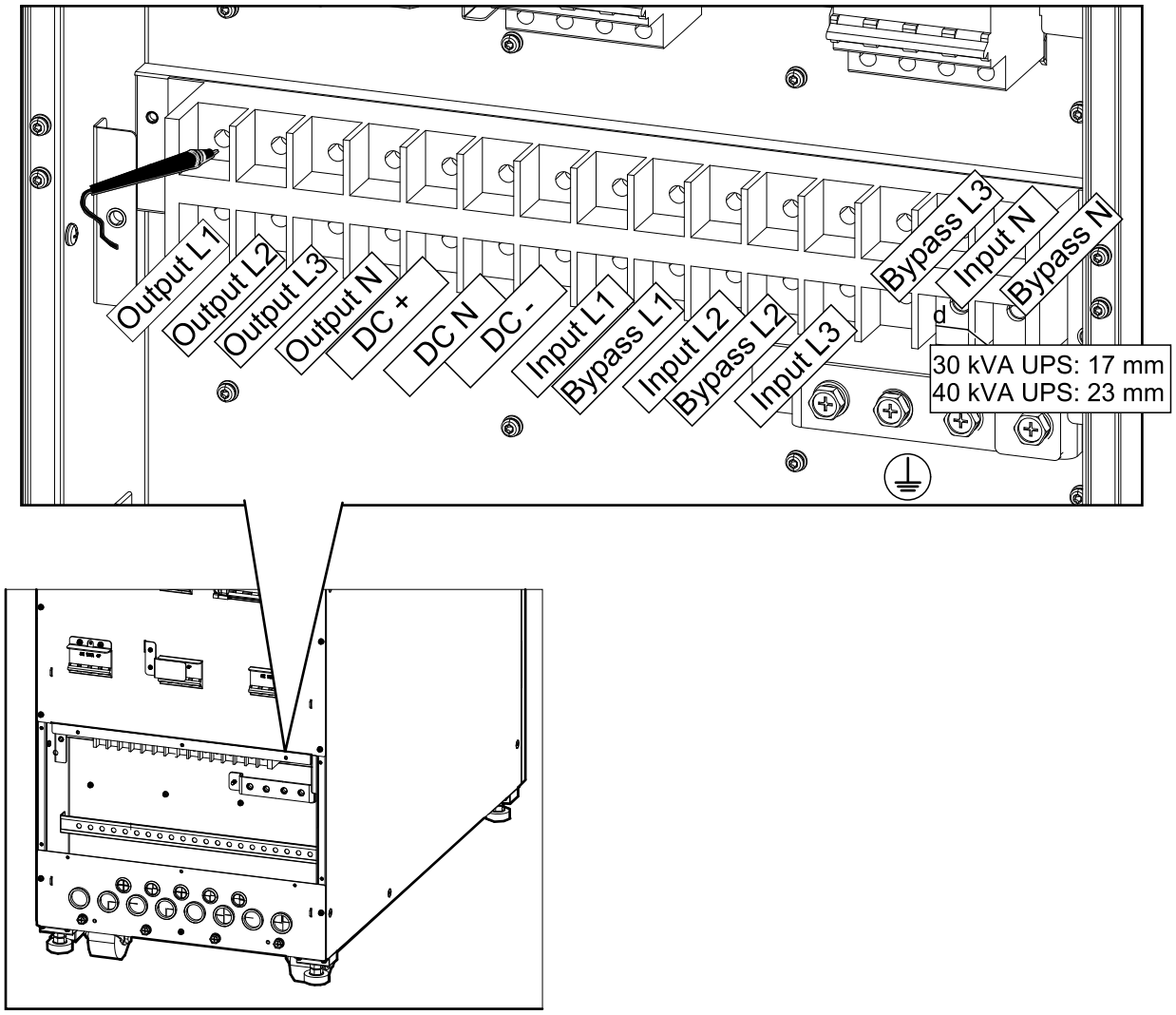
Measure for and verify ABSENCE of voltage on each input/bypass/output/neutral/battery busbar before continuing.

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

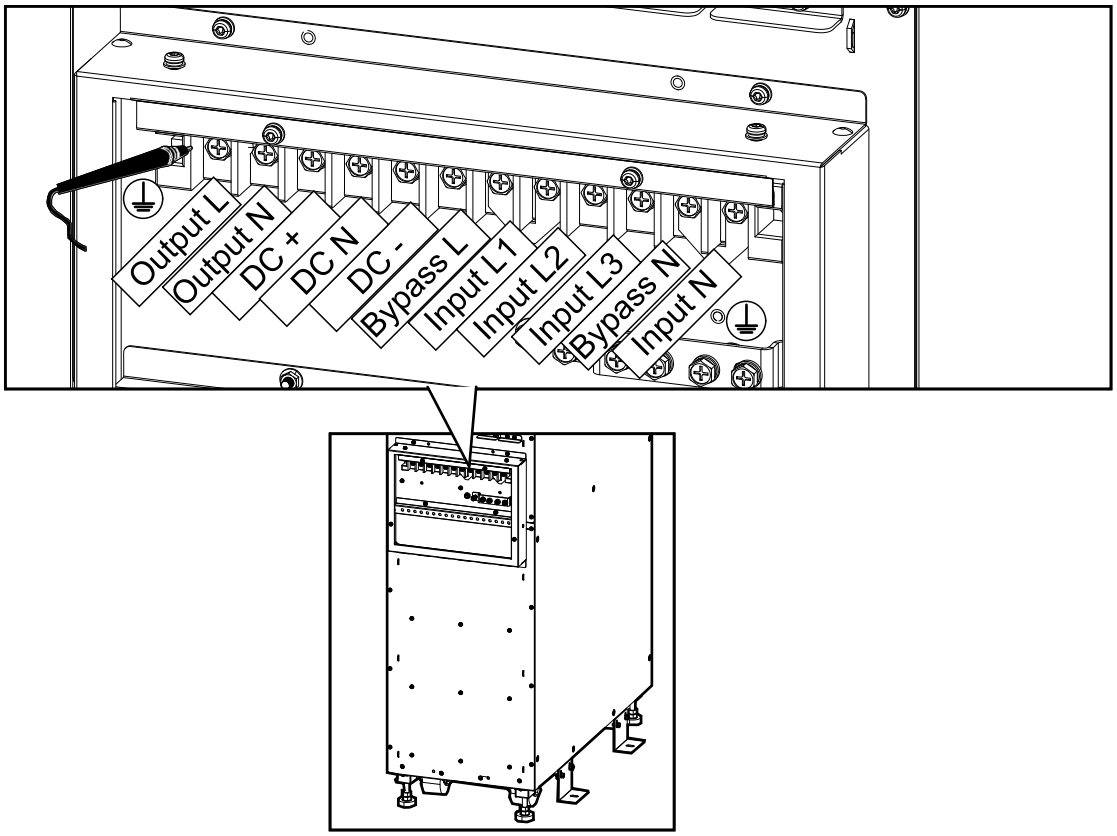
Rear View of 10-20 kVA 3:3 UPS



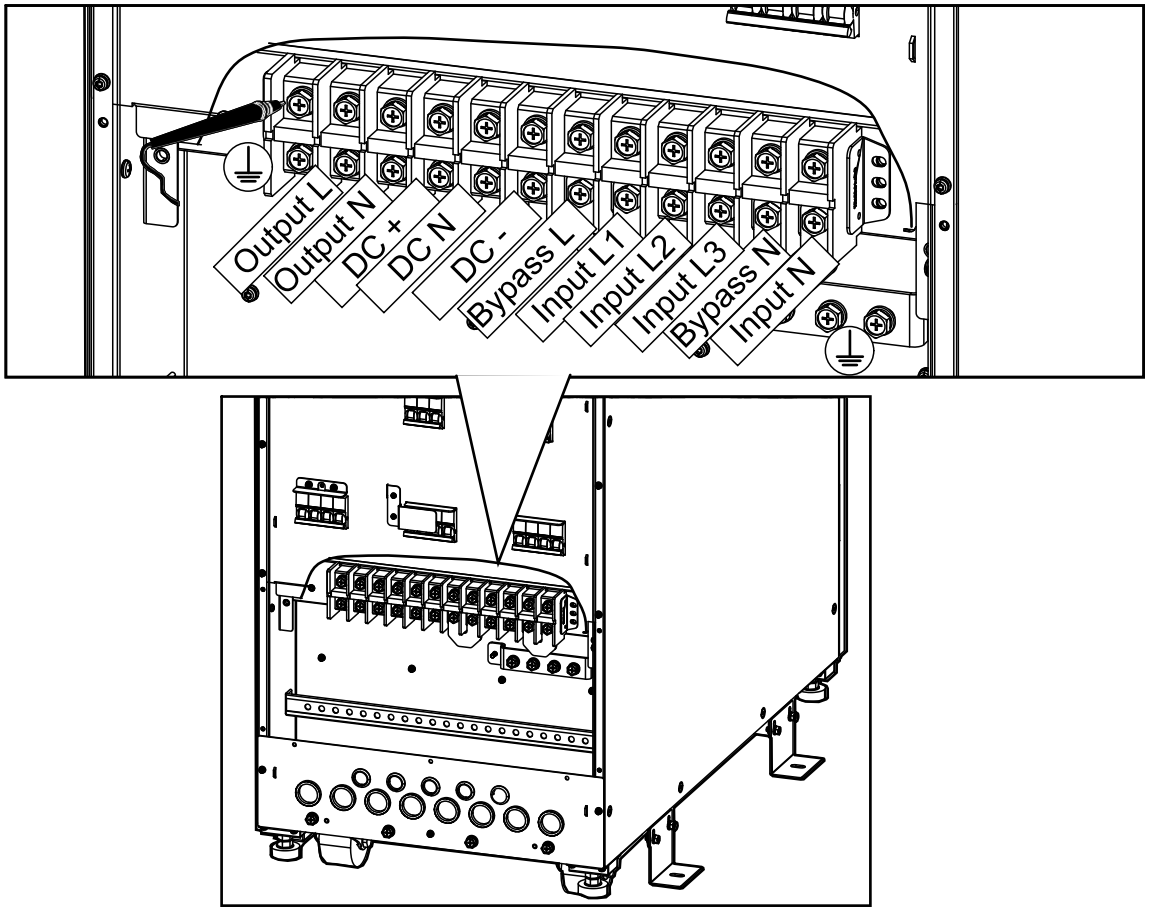
Rear View of 30-40 kVA 3:3 UPS



Rear View of 10-20 kVA 3:1 UPS



Rear View of 30 kVA 3:1 UPS



12. Disconnect and remove all power cables from the UPS. See Connect the Power Cables, page 62 for details.

13. Disconnect and remove all signal cables from the UPS. See Connect the Signal Cables, page 90 for details.
14. Reinstall the transparent protective cover on the terminal blocks.
15. Reinstall the conduit box cover on the UPS.
16. If installed, remove the transportation brackets from the left and right side of the UPS.
17. Raise the leveling feet of the UPS until the casters have full contact with the floor.
18. You can now move the UPS by rolling it over the floor on the casters.

> **⚠WARNING**
>
> **TIPPING HAZARD**
>
> - The casters of the UPS are exclusively for transport on flat, even, hard, and horizontal surfaces.
> - The casters of the UPS are intended for transport over short distances (i.e. inside the same building).
> - Move at a slow pace and pay close attention on the floor conditions and the balance of the UPS.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

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

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

Transportation requirements:

- Schneider Electric recommends to reuse the original shipping pallet in combination with the original transportation brackets for long-distance transportation, if in undamaged condition. If the original shipping pallet and original transportation brackets are not available or are damaged, use an appropriate pallet suitable for the weight of the UPS with appropriate dimensions.
  - Weight for 10-20 kVA UPS: 119 kg
  - Weight for 30-40 kVA UPS: 151 kg
  - Appropriate pallet dimension for 10-20 kVA UPS: minimum 1200 mm x 800 mm
  - Appropriate pallet dimension for 30-40 kVA UPS: minimum 1200 mm x 800 mm
- Use appropriate means of fixation to mount the UPS to the pallet. Follow the procedures in the receiving and unpacking manual to fix the UPS to the pallet when using the original pallet and transportation brackets.

⚠DANGER

TIPPING HAZARD

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

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

⚠WARNING

UNEXPECTED EQUIPMENT BEHAVIOR

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

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

20. Perform one of the following:
    – Decommission the UPS, OR
    – Move the UPS to a new location to install it.
21. **Only for installing the UPS in a new location**: Follow the installation manual to install the UPS in the new location. See Installation Procedure, page 56 for installation overview. Start-up must only be performed by Schneider Electric.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Start-up must only be performed by Schneider Electric.

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

Appendix: Switch/Circuit Breaker Model Details

UPS for Internal Batteries

3:1 UPS

	Model	Switch/Circuit Breaker Model (50)	Description	Switch or Circuit Breaker
10 kVA	UIB	A9F28432	32A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	BB	A9S68332	32A 3P	Switch
	SSIB	A9S68263	63A 2P	Switch
	MBB	A9S68263	63A 2P	Switch
	UOB	A9S68263	63A 2P	Switch
15 kVA	UIB	A9F28440	40A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	BB	A9S68363	63A 3P	Switch
	SSIB	A9S68280	80A 2P	Switch
	MBB	A9S68280	80A 2P	Switch
	UOB	A9S68280	80A 2P	Switch
20 kVA	UIB	A9F28463	63A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	BB	A9S68363	63A 3P	Switch
	SSIB	A9S68292	125A 2P	Switch
	MBB	A9S68292	125A 2P	Switch
	UOB	A9S68292	125A 2P	Switch
30 kVA	UIB	A9F28480	80A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	BB	A9S68391	100A 3P	Switch
	SSIB	A9S68480	80A 4P	Switch
	MBB	A9S68480	80A 4P	Switch
	UOB	A9S68480	80A 4P	Switch

(50) Available for ordering via the official website.

3:3 UPS

	Model	Switch/Circuit Breaker Model (51)	Description	Switch or Circuilt Breaker
10 kVA	UIB	A9F28432	32A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	SSIB	A9S68432	32A 4P	Switch
	UOB	A9S68432	32A 4P	Switch
	MBB	A9S68432	32A 4P	Switch
	BB	A9S68332	32A 3P	Switch
15 kVA	UIB	A9F28440	40A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	SSIB	A9S68440	40A 4P	Switch
	UOB	A9S68440	40A 4P	Switch
	MBB	A9S68440	40A 4P	Switch
	BB	A9S68363	63A 3P	Switch
20 kVA	UIB	A9F28463	63A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	SSIB	A9S68463	63A 4P	Switch
	UOB	A9S68463	63A 4P	Switch
	MBB	A9S68463	63A 4P	Switch
	BB	A9S68363	63A 3P	Switch
30 kVA	UIB	A9F28480	80A 4P	Circuit breaker
		A9A26478	1P	iMX
		A9A26934	1P	iOF
	SSIB	A9S68480	80A 4P	Switch
	UOB	A9S68480	80A 4P	Switch
	MBB	A9S68480	80A 4P	Switch
	BB	A9S68391	100A 3P	Switch
40 kVA	UIB	A9I48492	125A 4P	Circuit breaker
		A9N26478	1P	MX
		A9N26934	1P	OF
	SIB	A9S68492	125A 4P	Switch
	UOB	A9S68492	125A 4P	Switch
	MBB	A9S68492	125A 4P	Switch
	BB	A9S68392	125A 3P	Switch

(51) Available for ordering via the official website.

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

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