

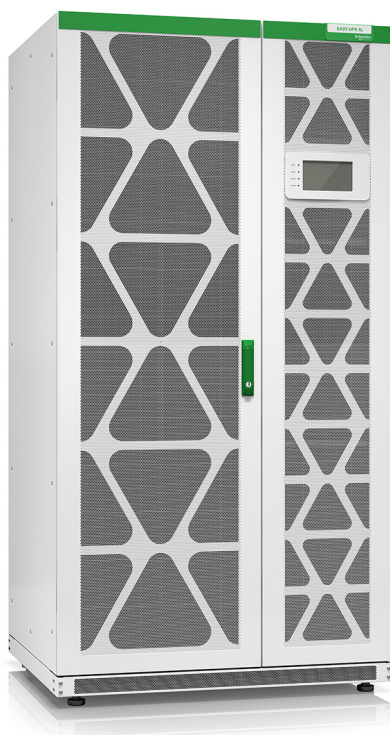
# Easy UPS 3L

## UPS for External Batteries

### Installation

500-600 kVA 400 V

2/2023



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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.

## Electromagnetic Compatibility

### NOTICE

#### RISK OF ELECTROMAGNETIC DISTURBANCE

This is a product Category C3 according to IEC 62040-2. This is a product for commercial and industrial applications in the second environment - installation restrictions or additional measures may be needed to prevent disturbances. The second environment includes all commercial, light industry, and industrial locations other than residential, commercial, and light industrial premises directly connected without intermediate transformer to a public low-voltage mains supply. The installation and cabling must follow the electromagnetic compatibility rules, e.g.:

- the segregation of cables,
- the use of shielded or special cables when relevant,
- the use of grounded metallic cable tray and supports.

**Failure to follow these instructions can result in equipment damage.**

## Safety Precautions

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

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

**⚠ DANGER**

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

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

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

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

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

**⚠ DANGER**

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

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

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

**⚠ DANGER**

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

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

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

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

**⚠ DANGER**

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

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

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

**⚠ WARNING**

**HAZARD OF ARC FLASH**

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

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

**NOTICE****RISK OF OVERHEATING**

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

**Failure to follow these instructions can result in equipment damage.**

**NOTICE****RISK OF EQUIPMENT DAMAGE**

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

**Failure to follow these instructions can result in equipment damage.**

**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 mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- 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. The disconnection device must be easily accessible and visible.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

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

**⚠ 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):

|   |
|---|
| <b>⚠ DANGER</b>   |
| <b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b>  |
| Risk of Voltage Backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth. |
| <b>Failure to follow these instructions will result in death or serious injury.</b>   |

|  |
|--|
| <b>⚠ CAUTION</b>   |
| <b>RISK OF ELECTRICAL DISTURBANCE</b>  |
| 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. |
| <b>Failure to follow these instructions can result in injury or equipment damage.</b>  |

## Battery Safety

|   |
|---|
| <b>⚠⚠ DANGER</b>  |
| <b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b>  |
| <ul style="list-style-type: none"><li>• Battery circuit breakers must be installed according to the specifications and requirements as defined by Schneider Electric.</li><li>• 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.</li><li>• Disconnect charging source prior to connecting or disconnecting battery terminals.</li><li>• Do not dispose of batteries in a fire as they can explode.</li><li>• Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.</li></ul> |
| <b>Failure to follow these instructions will result in death or serious injury.</b>   |

**⚡⚠ 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.**

# Specifications

## Input Specifications

| UPS rating                       | 500 kVA  |     |     | 600 kVA |      |      |
|----------------------------------|--|-----|-----|---------|------|------|
| Voltage (V)                      | 380  | 400 | 415 | 380     | 400  | 415  |
| Connections                      | L1, L2, L3, N, PE                                |     |     |         |      |      |
| Input voltage range (V)          | 323-477 (full load)                              |     |     |         |      |      |
| Frequency range (Hz)             | 40-70  |     |     |         |      |      |
| Nominal input current (A)        | 808  | 768 | 740 | 970     | 921  | 888  |
| Maximum input current (A)        | 946  | 899 | 866 | 1135    | 1079 | 1040 |
| Input current limitation (A)     | 1080   |     |     | 1320    |      |      |
| Total harmonic distortion (THDI) | <3% for linear loads<br><5% for non-linear loads |     |     |         |      |      |
| Input power factor               | >0.99  |     |     |         |      |      |
| Maximum short circuit rating     | Icc=35 kA  |     |     |         |      |      |
| Ramp-in                          | 7 seconds  |     |     |         |      |      |

## Bypass Specifications

| UPS rating                   | 500 kVA  |     |     | 600 kVA |     |     |
|------------------------------|--|-----|-----|---------|-----|-----|
| Voltage (V)                  | 380  | 400 | 415 | 380     | 400 | 415 |
| Connections                  | L1, L2, L3, N, PE  |     |     |         |     |     |
| Overload capacity            | ≤115% continuous<br>125% for 10 minutes<br>150% for 1 minute |     |     |         |     |     |
| Minimum bypass voltage (V)   | 209  | 221 | 228 | 209     | 221 | 228 |
| Maximum bypass voltage (V)   | 475  | 480 | 477 | 475     | 480 | 477 |
| Frequency (Hz)               | 50 or 60   |     |     |         |     |     |
| Frequency range (%)          | ±1, ±2, ±4, ±5, ±10. Default is ±10 (user selectable).       |     |     |         |     |     |
| Nominal bypass current (A)   | 767  | 729 | 703 | 921     | 875 | 843 |
| Maximum short circuit rating | Icc=35 kA  |     |     |         |     |     |

## Output Specifications

| UPS rating  | 500 kVA   |     |     | 600 kVA       |     |     |
|---|---|-----|-----|---------------|-----|-----|
| Voltage (V)   | 380   | 400 | 415 | 380           | 400 | 415 |
| Connections   | L1, L2, L3, N, PE   |     |     |               |     |     |
| Overload capacity <sup>1</sup>                                  | 105% continuous<br>125% for 10 minutes<br>150% for 1 minute |     |     |               |     |     |
| Output voltage regulation                                       | ±1%   |     |     |               |     |     |
| Dynamic load response   | 20 milliseconds   |     |     |               |     |     |
| Output power factor   | 1   |     |     |               |     |     |
| Nominal output current (A)                                      | 760   | 722 | 696 | 912           | 866 | 835 |
| Total harmonic distortion (THDU)                                | <2% at 100% linear load<br><4% at 100% non-linear load      |     |     |               |     |     |
| Output frequency (Hz)   | 50 or 60  |     |     |               |     |     |
| Slew rate (Hz/sec)  | Programmable: 0.5 to 2.0<br>Default is 0.5                  |     |     |               |     |     |
| Output performance classification (according to IEC/ EN62040-3) | VFI-SS-111  |     |     |               |     |     |
| Load power factor   | 0.5 leading to 0.5 lagging without derating                 |     |     |               |     |     |
| Output short circuit current (inverter)                         | 1.2 kA/200 ms   |     |     | 1.5 kA/200 ms |     |     |

1. At 30 °C and output power factor 0.9.

## Battery Specifications

**NOTE:** The UPS supports 36-50 battery blocks.

| UPS rating   | 500 kVA   | 600 kVA   |
|--|---|-----------|
| Max. charging power in % of output power                     | 21%   | 22%       |
| Maximum charging power (kW)                                  | 108   | 132       |
| Nominal battery voltage (VDC)                                | ±216 to ±300  |           |
| Nominal float voltage (VDC)                                  | ±243 to ±337.5                                      |           |
| End of discharge voltage (full load) (VDC)                   | ±172.8 to ±240                                      |           |
| Battery current at full load and nominal battery voltage (A) | 1231-886  | 1470-1058 |
| Battery current at full load and minimum battery voltage (A) | 1539-1102   | 1847-1323 |
| Temperature compensation (per cell) <sup>2</sup>             | Programmable from 0 to 7 mV/°C. Default is 0 mV/°C. |           |
| Ripple current   | <5% C10   |           |

## Recommended Upstream 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.

| UPS rating   | 500 kVA                         |                                 | 600 kVA                         |                                 |
|--------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
|              | Input                           | Bypass                          | Input                           | Bypass                          |
| Breaker type | NS1000N Mic 2.0 (33475/NS33475) | NS1000N Mic 2.0 (33475/NS33475) | NS1250N Mic 2.0 (33480/NS33480) | NS1250N Mic 2.0 (33480/NS33480) |
| In setting   | 1                               | 1                               | 1                               | 1                               |
| Ir setting   | 0.95                            | 0.9                             | 0.9                             | 0.9                             |
| Im setting   | Isd=1.5-10                      | Isd=1.5-10                      | Isd=1.5-10                      | Isd=1.5-10                      |

2. If the temperature is above 25 °C. No compensation below 25 °C.

## Recommended Cables 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 is 240 mm<sup>2</sup>.

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

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

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

PE size is based on table 54.2 of IEC 60364-5-54.

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

**NOTE:** Battery cables are sized according to 36 battery blocks.

### 500 kVA UPS

|         | Cable size per phase (mm <sup>2</sup> ) | Neutral cable size (mm <sup>2</sup> ) | PE cable size (mm <sup>2</sup> ) |
|---------|---|---------------------------------------|----------------------------------|
| Input   | 3 x 185                                 | 3 x 185                               | 2 x 150                          |
| Bypass  | 3 x 185                                 | 3 x 185                               | 2 x 150                          |
| Output  | 3 x 185                                 | 3 x 185                               | 2 x 150                          |
| Battery | 6 x 120                                 | 6 x 120                               | 3 x 120                          |

### 600 kVA UPS

|         | Cable size per phase (mm <sup>2</sup> ) | Neutral cable size (mm <sup>2</sup> ) | PE cable size (mm <sup>2</sup> ) |
|---------|---|---------------------------------------|----------------------------------|
| Input   | 3 x 240                                 | 3 x 240                               | 2 x 185                          |
| Bypass  | 3 x 240                                 | 3 x 240                               | 2 x 185                          |
| Output  | 3 x 240                                 | 3 x 240                               | 2 x 185                          |
| Battery | 6 x 150                                 | 6 x 150                               | 3 x 150                          |

## Recommended Bolts and Cable Lugs

| Cable Size (mm <sup>2</sup> ) | Bolt Size | Cable Lug Type |
|-------------------------------|-----------|----------------|
| 120                           | M12x35 mm | TLK 120-12     |
| 150                           | M12x35 mm | TLK 150-12     |
| 185                           | M12x35 mm | TLK 185-12     |
| 240                           | M12x35 mm | TLK 240-12     |


## Torque Specifications

| Bolt Size | Torque |
|-----------|--------|
| M12       | 50 Nm  |

# Requirements for a Third Party Battery Solution

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

## Third Party Battery Breaker Requirements

 **DANGER**

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

All selected battery breakers must be equipped with instantaneous trip functionality with an undervoltage release coil or a shunt trip release coil.

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

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

### Design Requirements for Battery Breaker

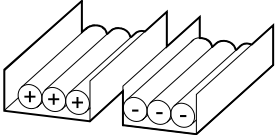
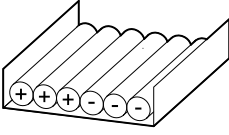
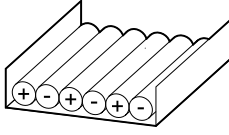
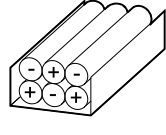
|  |   |
|--|---|
| Battery breaker rated DC voltage > Normal battery voltage          | The normal voltage of the battery configuration is defined as the highest nominal occurring battery voltage. This can be equivalent to the float voltage which may be defined as <b>number of battery blocks x number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

## Guidance for Organizing Battery Cables

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

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

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

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

## UPS Weights and Dimensions

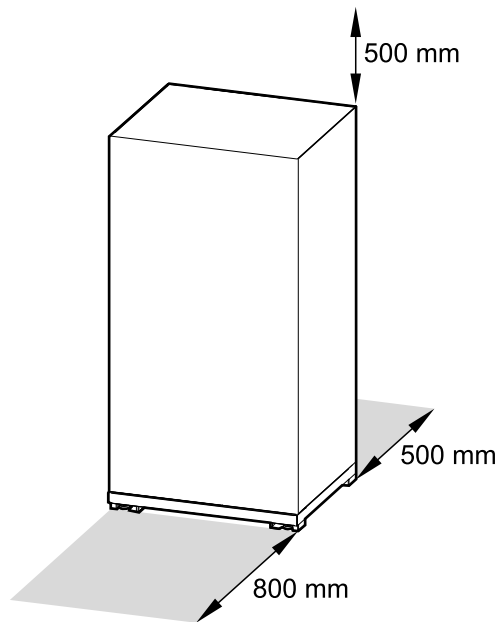
| UPS rating | Weight kg | Height mm | Width mm | Depth mm |
|------------|-----------|-----------|----------|----------|
| 500 kVA    | 665       | 1970      | 1000     | 850      |
| 600 kVA    | 745       | 1970      | 1000     | 850      |

## UPS Shipping Weights and Dimensions

| UPS rating | Weight kg | Height mm | Width mm | Depth mm |
|------------|-----------|-----------|----------|----------|
| 500 kVA    | 720       | 2100      | 1200     | 1015     |
| 600 kVA    | 800       | 2100      | 1200     | 1015     |

## 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.



## Environmental

|   | Operating   | Storage   |
|---|---|---|
| Temperature                                 | 0 °C to 30 °C   | -15 °C to 40 °C for systems with batteries<br>-25 °C to 55 °C for systems without batteries |
| Relative humidity                           | 0-95% non-condensing  |   |
| Elevation derating according to IEC 62040-3 | Power derating factor:<br>0-1500 m: 1.000<br>1500-2000 m: 0.975 | < 15000 m above sea level (or in an environment with equivalent air pressure)               |
| Audible noise                               | <72 dBA at 100% load according to ISO3746                       |   |
| Protection class                            | IP20 (dust filter as standard)                                  |   |
| Color                                       | RAL 9003  |   |

## Heat Dissipation

| UPS rating   | 500 kVA |        | 600 kVA |        |
|--------------|---------|--------|---------|--------|
|              | W       | BTU/hr | W       | BTU/hr |
| Normal mode  | 31800   | 108507 | 37200   | 126932 |
| Battery mode | 28550   | 97417  | 33960   | 115877 |
| ECO mode     | 3250    | 11090  | 3480    | 11874  |

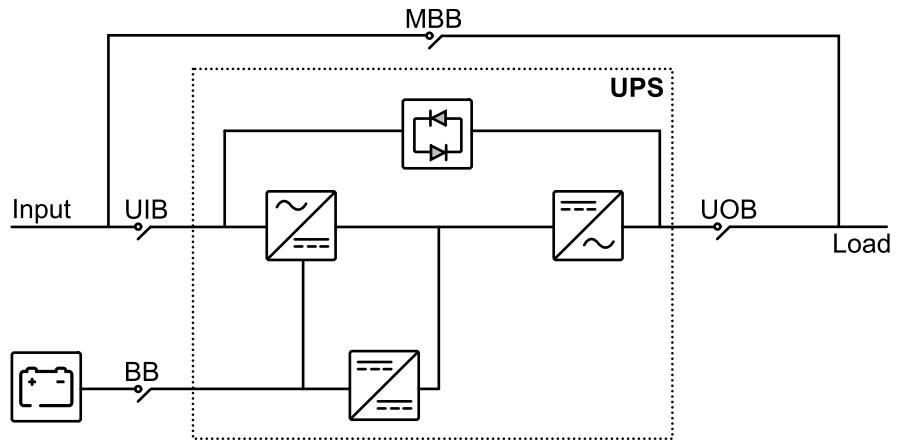
## Compliance

|                      |   |
|----------------------|---|
| Safety               | IEC 62040-1:2017, Edition 2.0, Uninterruptible power systems (UPS) – Part 1: Safety requirements<br>IEC 62040-1: 2008-6, 1st edition, Uninterruptible Power Systems (UPS) – Part 1: General and safety requirements for UPS<br>IEC 62040-1:2013-01, 1st edition amendment 1 |
| EMC                  | IEC 62040-2:2016, Edition 3.0, Uninterruptible power systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements.<br>IEC 62040-2:2005-10, 2nd edition, Uninterruptible Power Systems (UPS) – Part 2: Electromagnetic compatibility (EMC) requirements          |
| Performance          | IEC 62040-3: 2011-03, 2nd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements  |
| Environmental        | IEC 62040-4: 2013-04, 1st edition Uninterruptible Power Systems (UPS) - Part 4: Environmental aspects – Requirements and reporting  |
| Markings             | CE, RCM, EAC, WEEE  |
| Transportation       | ISTA 2B   |
| Pollution degree     | 2   |
| Overvoltage category | III   |
| Earthing system      | TN-S, TN-C, TT, or IT   |

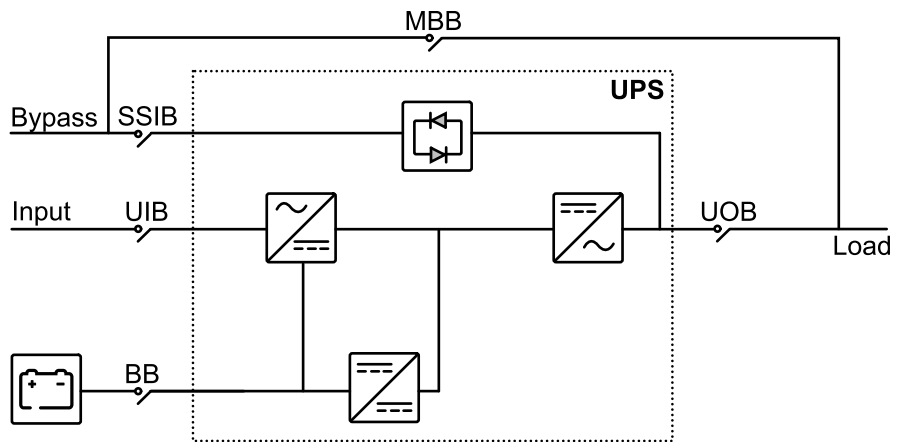
# Overview

## Overview of Single UPS

**Single Mains System**

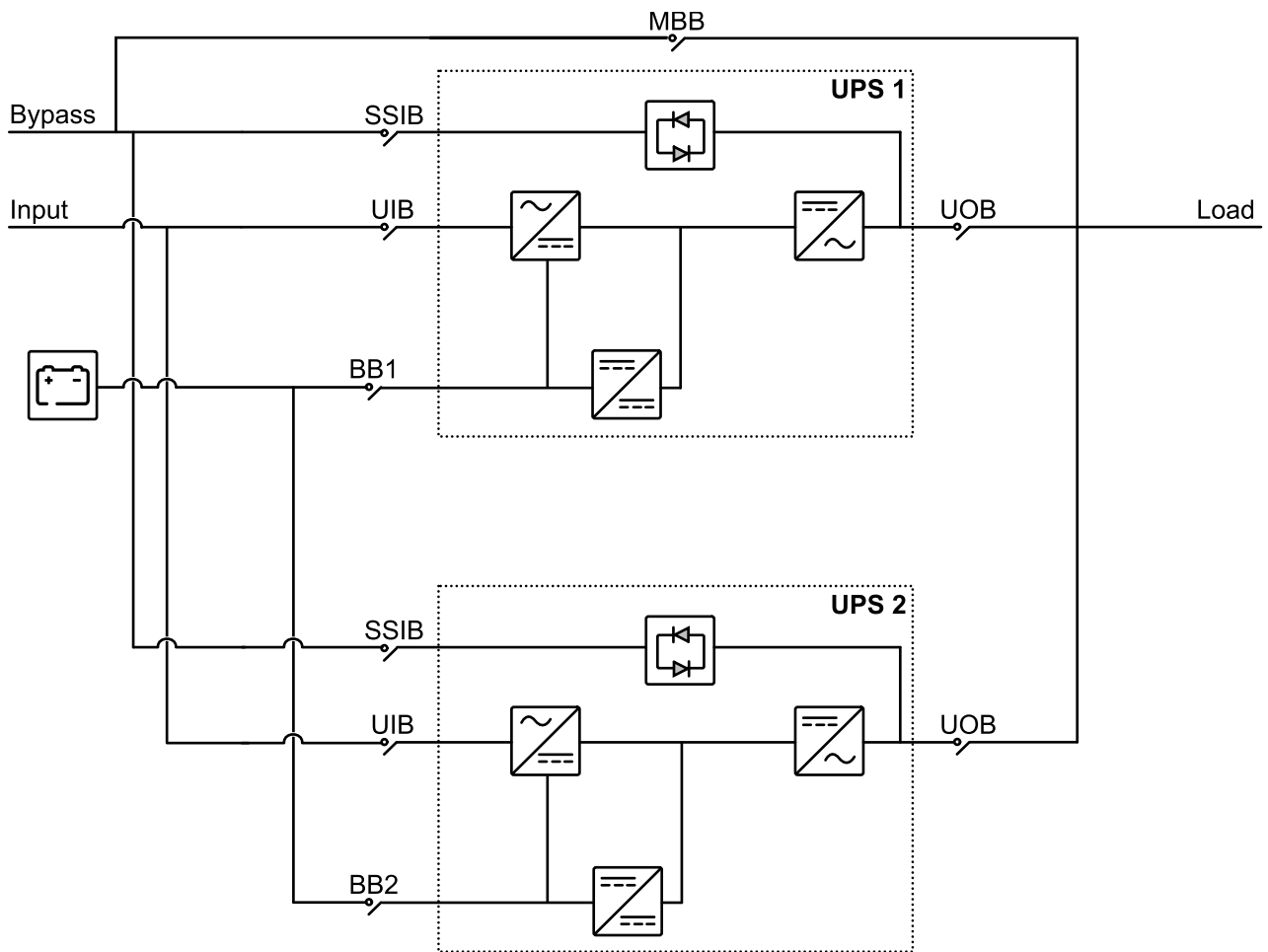


**Dual Mains System**



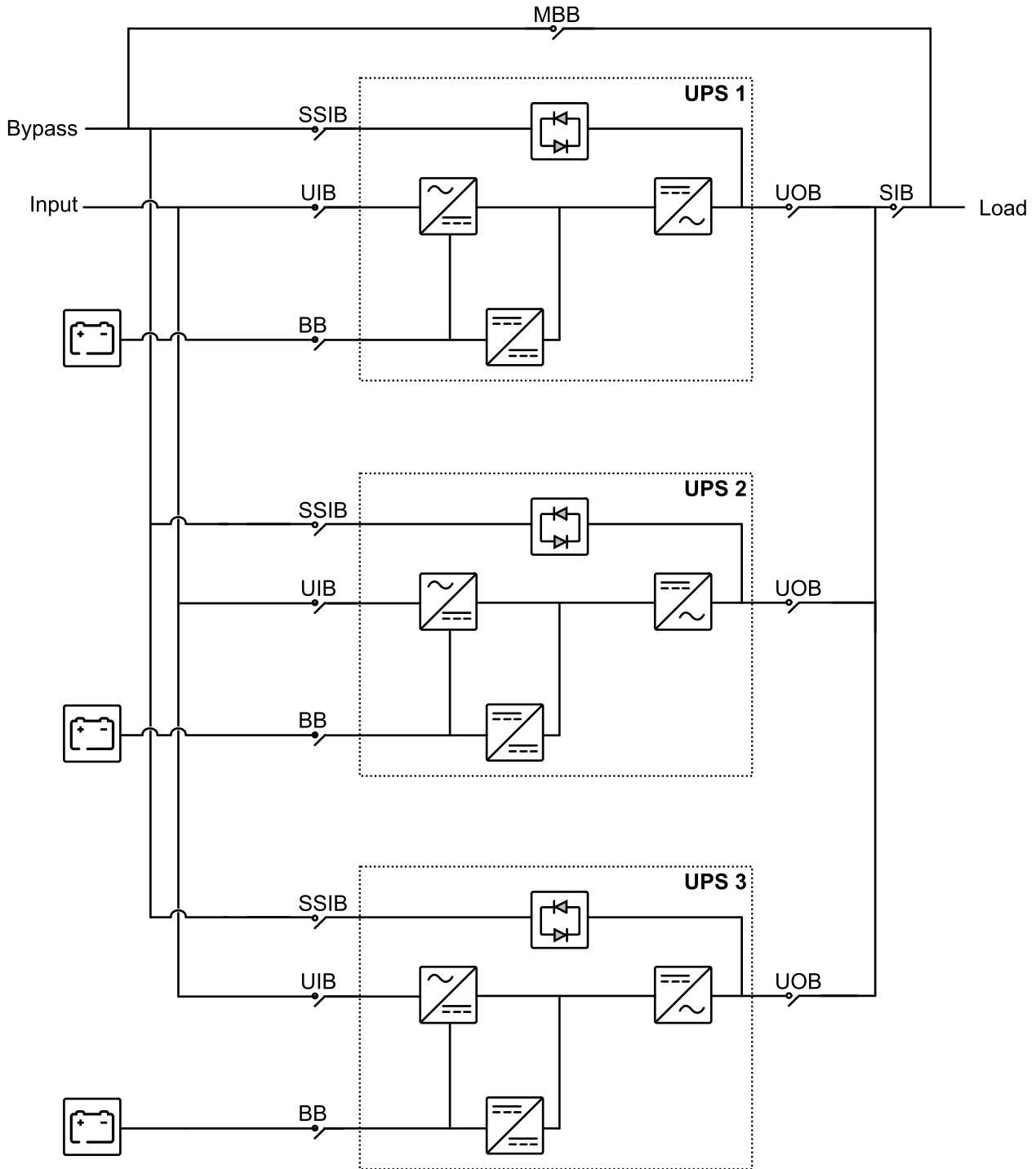
|      |                             |
|------|-----------------------------|
| UIB  | Unit input breaker          |
| SSIB | Static switch input breaker |
| UOB  | Unit output breaker         |
| MBB  | Maintenance bypass breaker  |
| BB   | Battery breaker             |

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



|      |                             |
|------|-----------------------------|
| UIB  | Unit input breaker          |
| SSIB | Static switch input breaker |
| UOB  | Unit output breaker         |
| MBB  | Maintenance bypass breaker  |
| BB1  | Battery breaker 1           |
| BB2  | Battery breaker 2           |

# Overview of Parallel System



|      |                             |
|------|-----------------------------|
| UIB  | Unit input breaker          |
| SSIB | Static switch input breaker |
| UOB  | Unit output breaker         |
| MBB  | Maintenance bypass breaker  |
| SIB  | System isolation breaker    |
| BB   | Battery breaker             |

## Connect the Power Cables

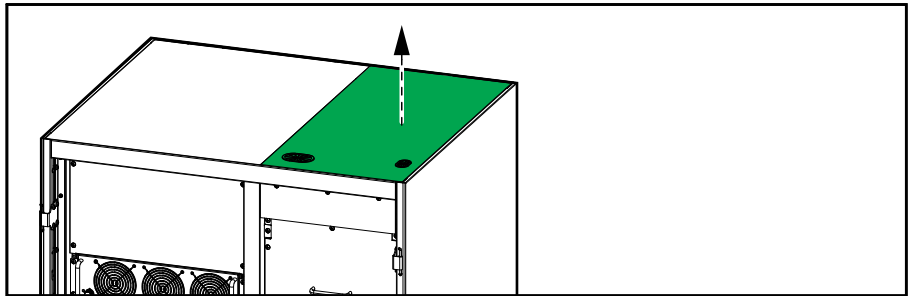
### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or punch holes with the top plate installed and do not drill or punch holes in close proximity to the UPS.

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

1. Ensure that all breakers are in the OFF (open) position.
2. Remove the top plate.



3. Drill or punch holes for power cables in the top plate.

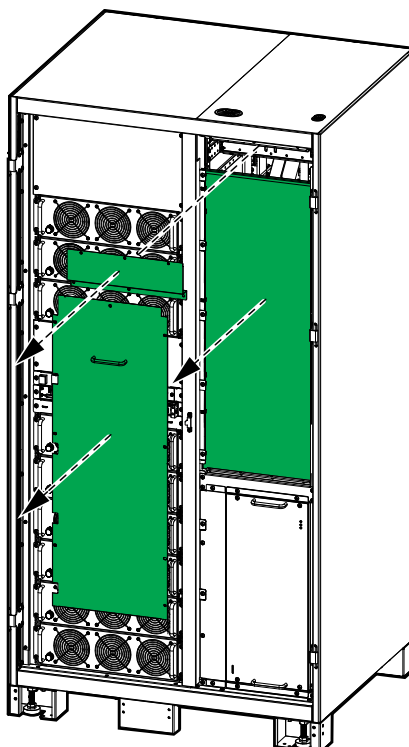
### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Ensure that there are no sharp edges that can damage the cables.

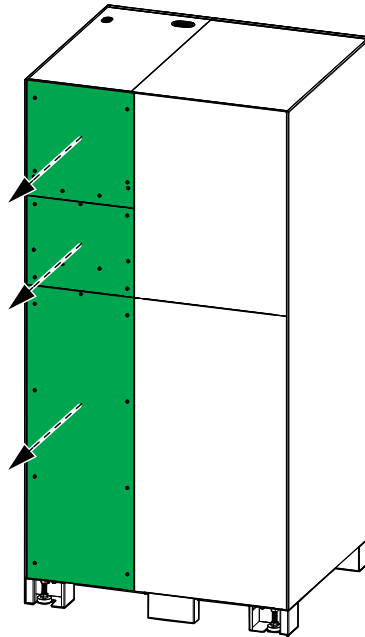
**Failure to follow these instructions will result in death or serious injury.**

4. Reinstall the top plate.
5. Remove the three plates.

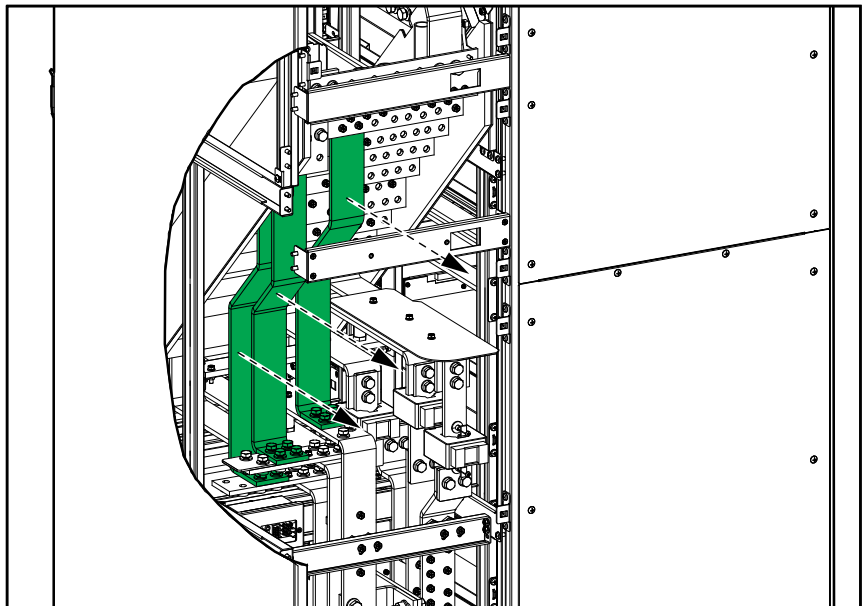


**6. Only for dual mains systems:**

- a. Remove the three rear plates.

**Rear View**

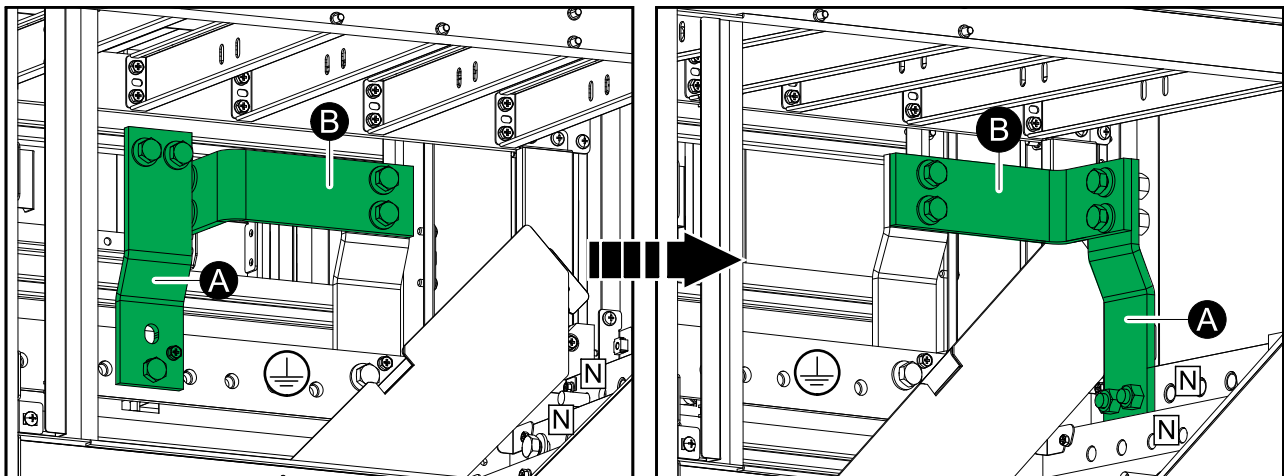
- b. Remove the three single mains busbars.

**Rear View**

- c. Reinstall the rear plates.

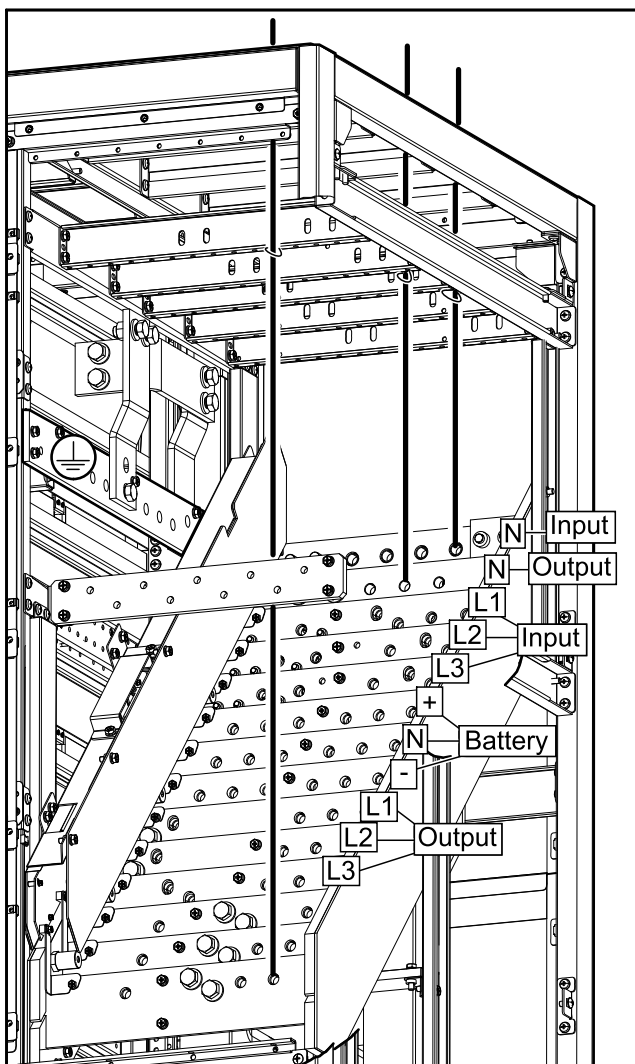
- In TNC systems only:** Remove the busbar (A) and install it on the neutral busbar. Remove the jumper busbar (B) and install it between the PE busbar and the neutral busbar.

**Right Side View**

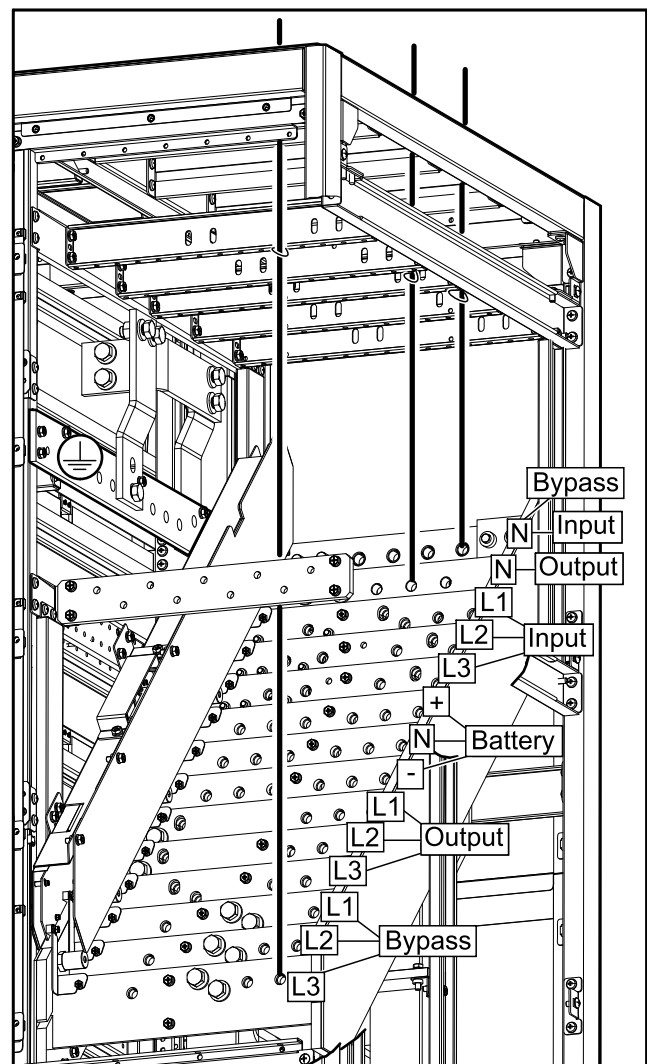


- Route the power cables through the top of the UPS and between the ladders.
- Connect the PE cable to the PE terminal.

**Single Mains System**

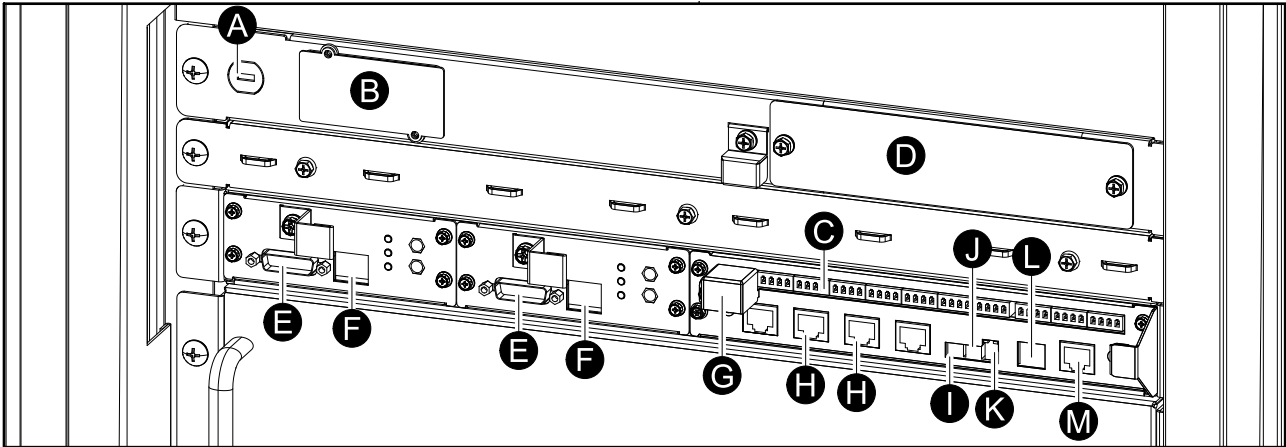


**Dual Mains System**

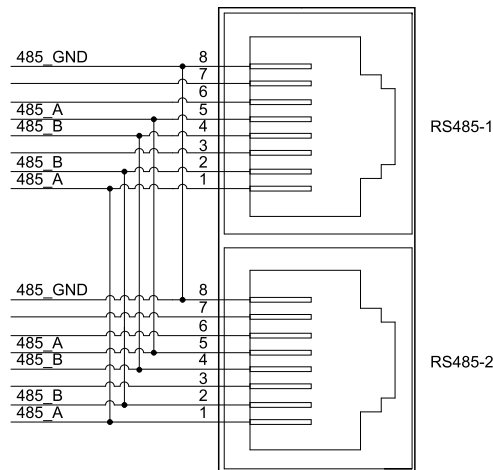


10. Connect the input cables, output cables, bypass cables (for dual mains systems), and battery cables.
11. Fasten the cables to the cable reliefs/the ladders.

# Communication Interfaces



- A. Slot for optional cold start button
- B. Slot for optional SNMP
- C. Dry contacts
- D. Auxiliary contacts
- E. Parallel ports
- F. Load Bus Synchronization port
- G. Remote EPO
- H. RS485

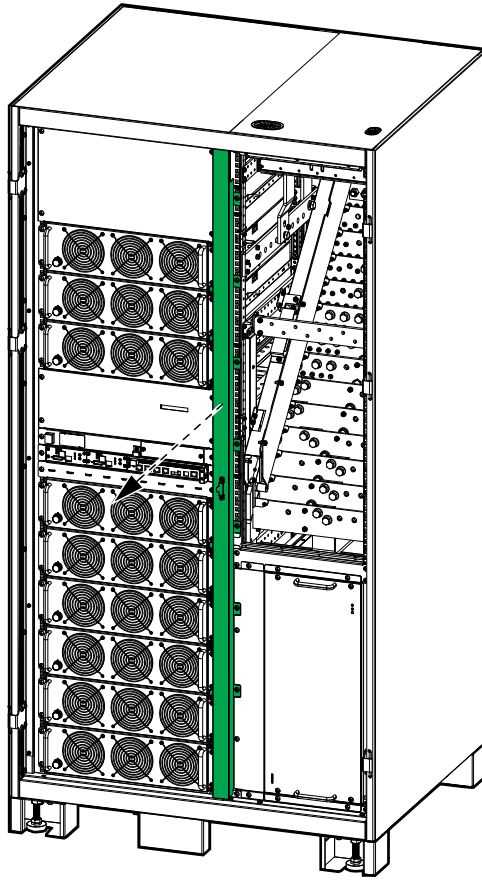


- I. Battery temperature sensor terminal<sup>3</sup>
- J. Ambient temperature sensor terminal (internal use)
- K. CAN\_R: CAN termination resistor
- L. USB port (for service)
- M. Display port (internal use)

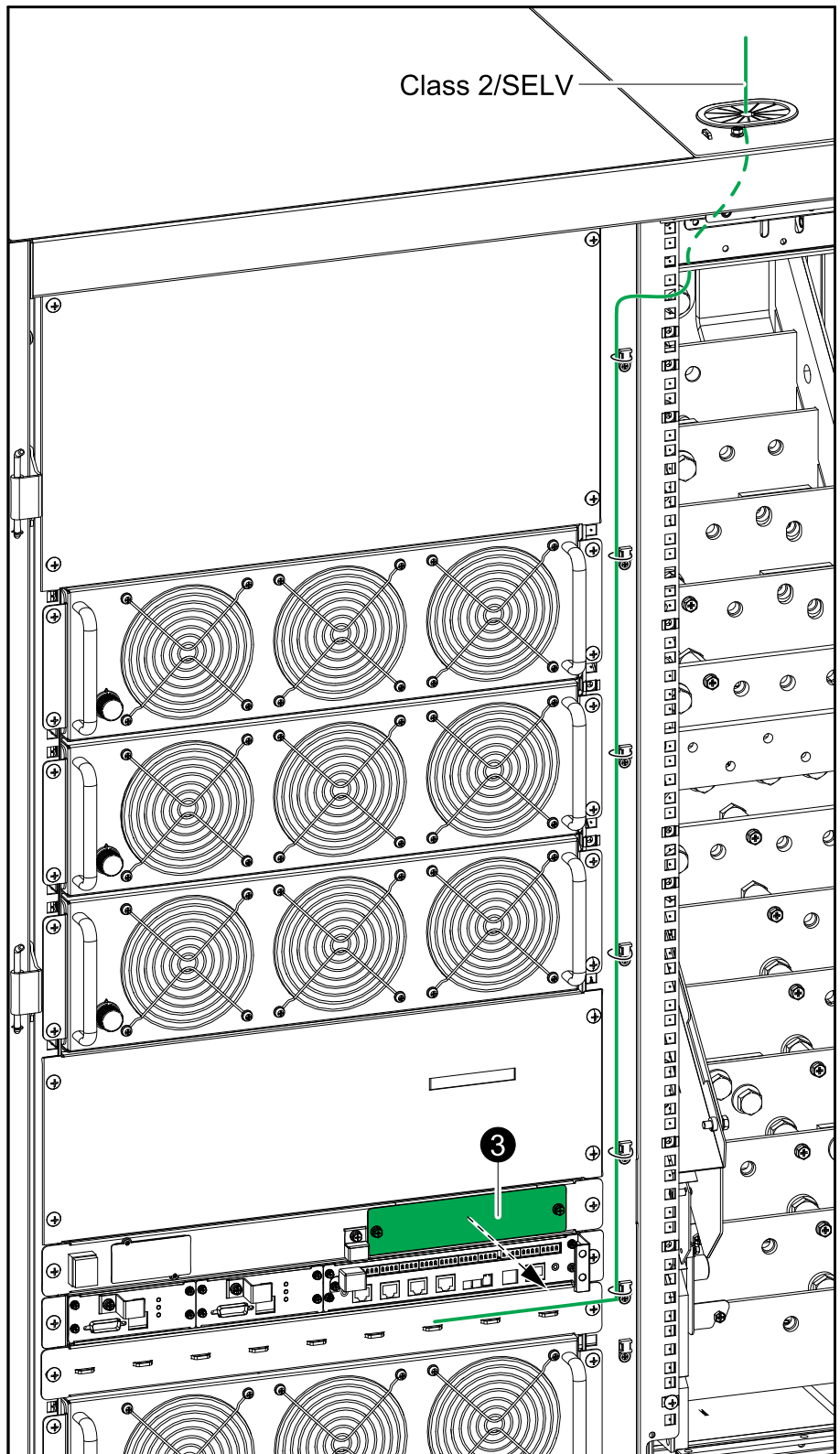
3. NTC: R25=30 kOhm, B25/50=3950 k

## Route the Signal Cables

1. Remove the signal cable cover from the UPS.

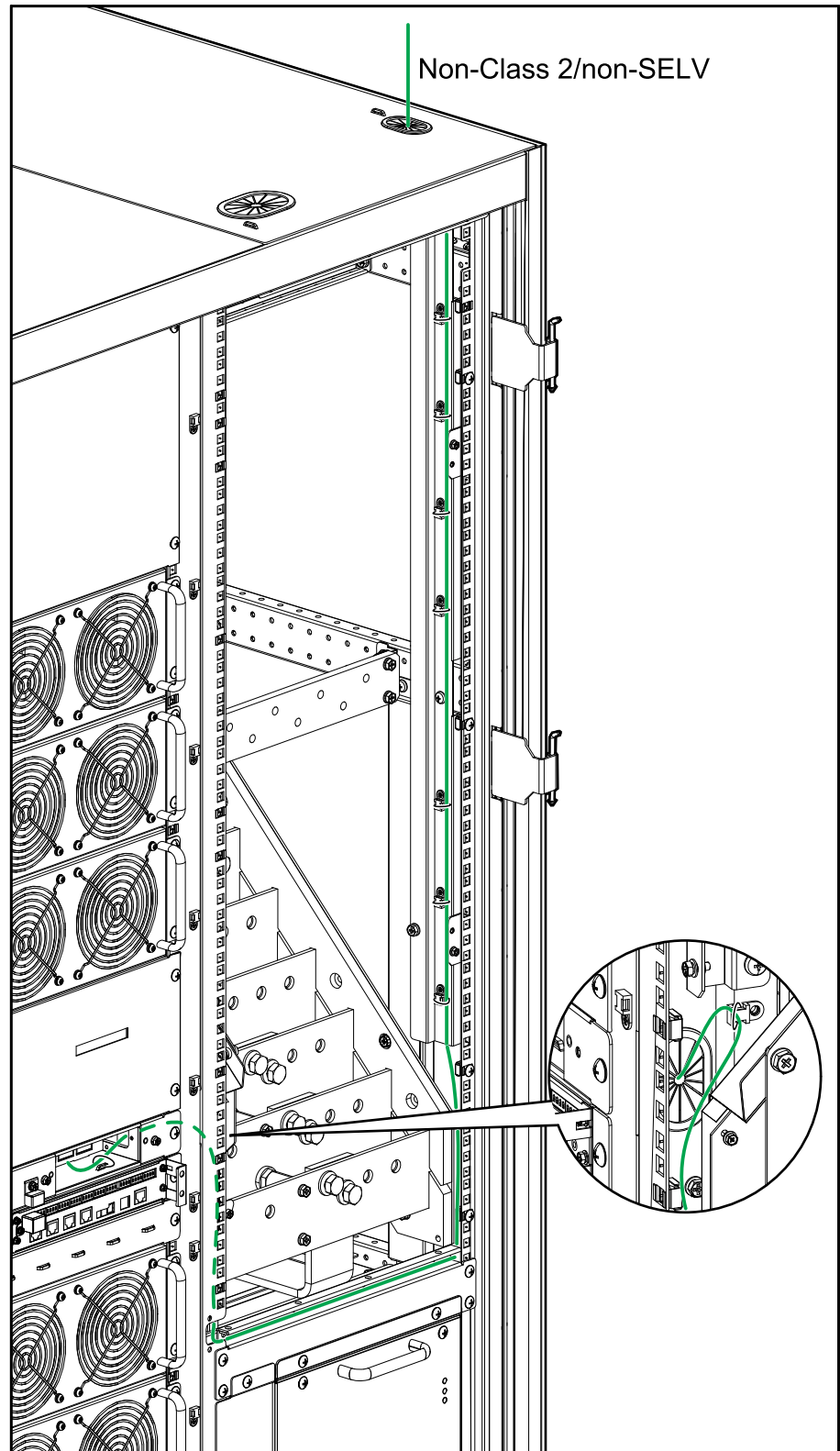


2. Route the Class 2/SELV signal cables through the top left entry opening and down along the front plate to the connection points.



3. Remove the protection cover in front of the non-Class 2/non-SELV terminals.

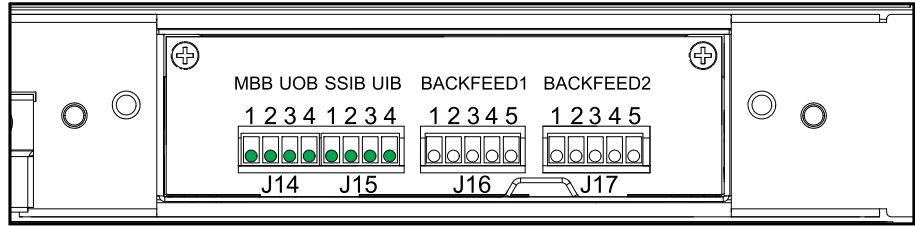
4. Route the non-Class 2/non-SELV signal cables through the top right opening and down to the non-Class 2/non-SELV terminals as shown.



5. Fasten the signal cables with cable ties as shown.

# Signal Connections

## AUX Switch Signal

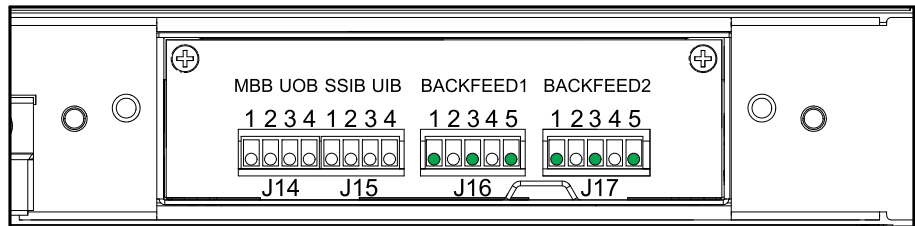


**NOTE:** These signal cables are non-Class 2/non-SELV.

**NOTE:** To use Class 2/SELV signal cables, you can connect the maintenance bypass breaker MBB to J2 instead.

| Terminal | Function                                      |  |
|----------|---|--|
| J14-1    | Maintenance bypass breaker (MBB) AUX switch   | 12 VDC/12 mA<br>non-Class 2/<br>non-SELV |
| J14-2    | Signal ground (GND)                           |  |
| J14-3    | Unit output breaker (UOB) AUX switch          |  |
| J14-4    | Signal ground (GND)                           |  |
| J15-1    | Static switch input breaker (SSIB) AUX switch | 12 VDC/12 mA<br>non-Class 2/<br>non-SELV |
| J15-2    | Signal ground (GND)                           |  |
| J15-3    | Unit input breaker (UIB) AUX switch           |  |
| J15-4    | Signal ground (GND)                           |  |

## Backfeed Signal



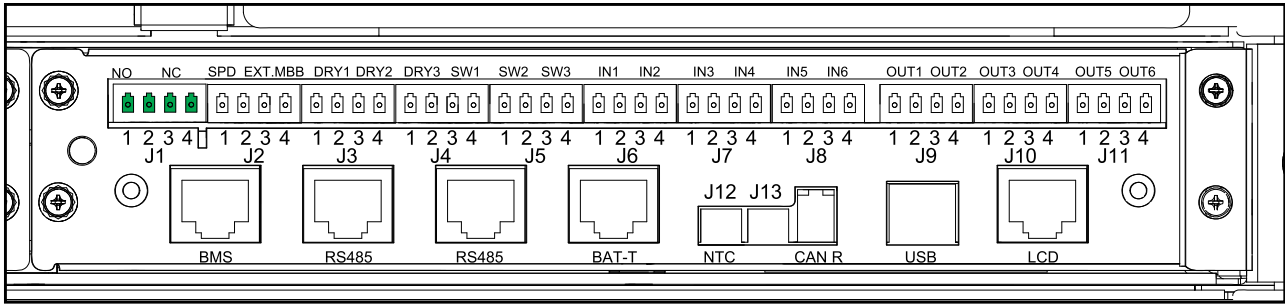
**NOTE:** These signal cable connections are non-Class 2/non-SELV.

Backfeed 1: Backfed on bypass.

Backfeed 2: Backfed on input.

| Terminal | Function                              |  |
|----------|---------------------------------------|--|
| J16-1    | Backfeed relay 1 common               | 30 VDC/1 A<br>230 VAC/1A<br>non-Class 2/<br>non-SELV |
| J16-3    | Backfeed relay 1 normally open (NO)   |  |
| J16-5    | Backfeed relay 1 normally closed (NC) |  |
| J17-1    | Backfeed relay 2 common               | 30 VDC/1 A<br>230 VAC/1A<br>non-Class 2/<br>non-SELV |
| J17-3    | Backfeed relay 2 normally open (NO)   |  |
| J17-5    | Backfeed relay 2 normally closed (NC) |  |

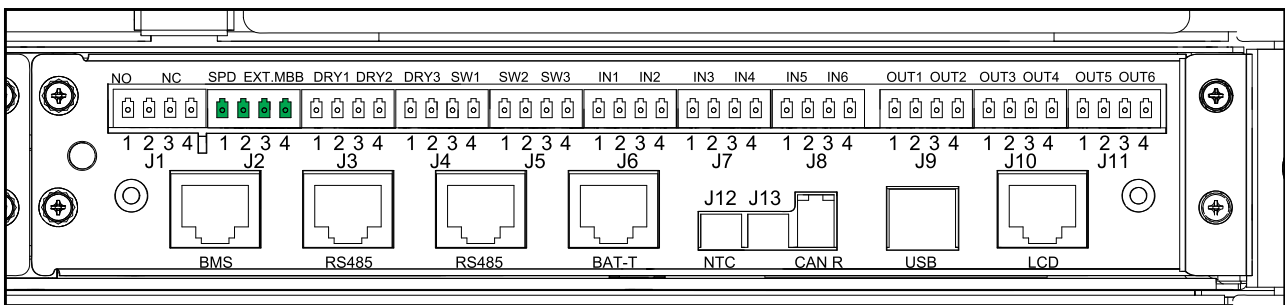
## EPO Signal



**NOTE:** These signal cables are Class 2/SELV.

| Terminal | Function                               |  |
|----------|--|--|
| J1-1     | EPO input contact normally open (NO)   | <p><b>EPO Normally Open (NO)</b></p>   |
| J1-2     | +12 V                                  |  |
| J1-3     | EPO input contact normally closed (NC) |  |
| J1-4     | +12 V                                  |  |
|          |  | <p><b>EPO Normally Closed (NC)</b></p> |

## Maintenance Bypass Breaker (MBB) Signal



**NOTE:** These signal cables are Class 2/SELV.

**NOTE:** To use non-Class 2/non-SELV signal cables, you can connect the maintenance bypass breaker MBB to J14 instead.

| Terminal | Function   |                                  |
|----------|--|----------------------------------|
| J2-1     | Internal use                                     | <p>12 VDC/12 mA Class 2/SELV</p> |
| J2-2     | Internal use                                     |                                  |
| J2-3     | Maintenance bypass breaker (Ext. MBB) AUX switch |                                  |
| J2-4     | Signal ground (GND)                              |                                  |

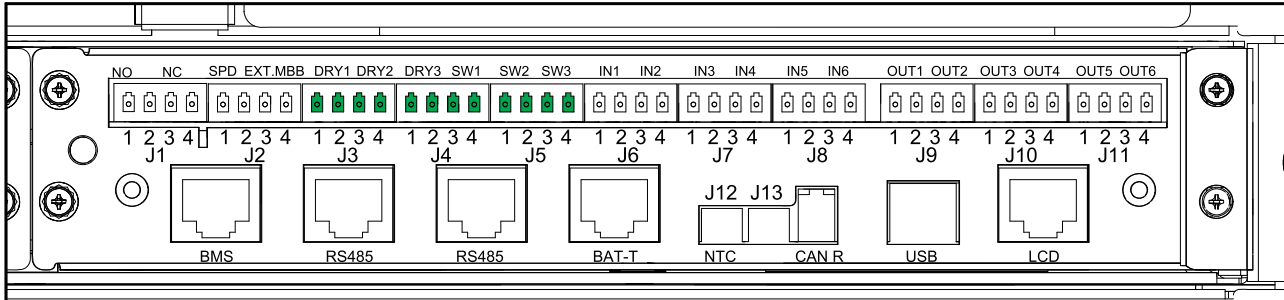
# Battery Signal

## NOTICE

**RISK OF EQUIPMENT DAMAGE**

The battery breaker contact drive J3, J4-1, and J4-2 can provide a maximum of +24 VDC 250 mA to the undervoltage release coil or shunt trip release coil. If this value is exceeded, it can damage the UPS.

**Failure to follow these instructions can result in equipment damage.**

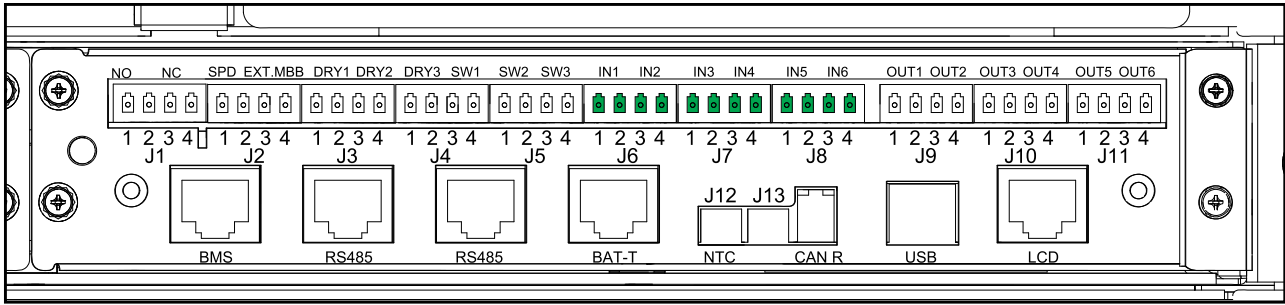


**NOTE:** These signal cables are Class 2/SELV.

| Terminal | Function   |  |
|----------|--|--|
| J3-1     | Battery relay 1, normally closed (NC) <sup>4</sup> |  |
| J3-2     | Battery relay 1, signal ground (GND)               |  |
| J3-3     | Battery relay 2, normally closed (NC) <sup>4</sup> |  |
| J3-4     | Battery relay 2, signal ground (GND)               |  |
| J4-1     | Battery relay 3, normally closed (NC) <sup>4</sup> |  |
| J4-2     | Battery relay 3, signal ground (GND)               |  |
| J4-3     | BB1 AUX switch                                     |  |
| J4-4     | Signal ground (GND)                                |  |
| J5-1     | BB2 AUX switch                                     |  |
| J5-2     | Signal ground (GND)                                |  |
| J5-3     | BB3 AUX switch                                     |  |
| J5-4     | Signal ground (GND)                                |  |

4. Supports undervoltage release coil by default. For support for shunt trip release coil, please contact Schneider Electric.

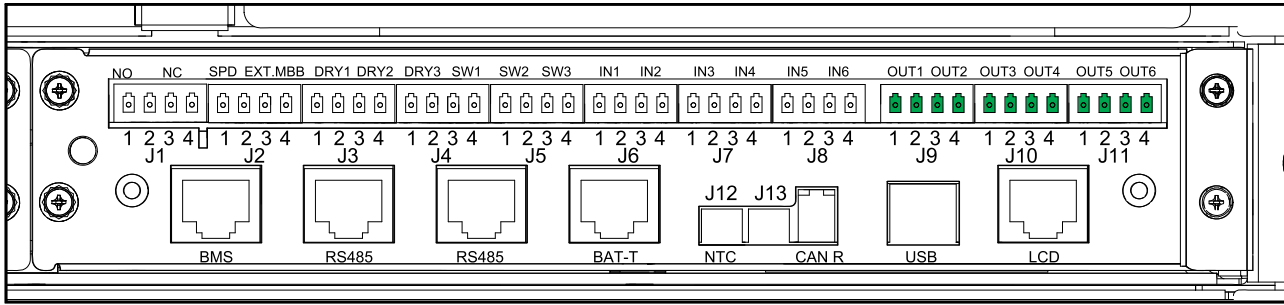
# Input Contact Signal



**NOTE:** These signal cables are Class 2/SELV.

| Terminal | Function                                     |                                  |
|----------|--|----------------------------------|
| J6-1     | Input contact 1, select function via display | 12 VDC/12 mA<br>Class 2/SELV<br> |
| J6-2     | Input contact 1, signal ground (GND)         |                                  |
| J6-3     | Input contact 2, select function via display |                                  |
| J6-4     | Input contact 2, signal ground (GND)         |                                  |
| J7-1     | Input contact 3, select function via display | 12 VDC/12 mA<br>Class 2/SELV<br> |
| J7-2     | Input contact 3, signal ground (GND)         |                                  |
| J7-3     | Input contact 4, select function via display |                                  |
| J7-4     | Input contact 4, signal ground (GND)         |                                  |
| J8-1     | Input contact 5, select function via display | 12 VDC/12 mA<br>Class 2/SELV<br> |
| J8-2     | Input contact 5, signal ground (GND)         |                                  |
| J8-3     | Input contact 6, select function via display |                                  |
| J8-4     | Input contact 6, signal ground (GND)         |                                  |

## Output Relay Signal



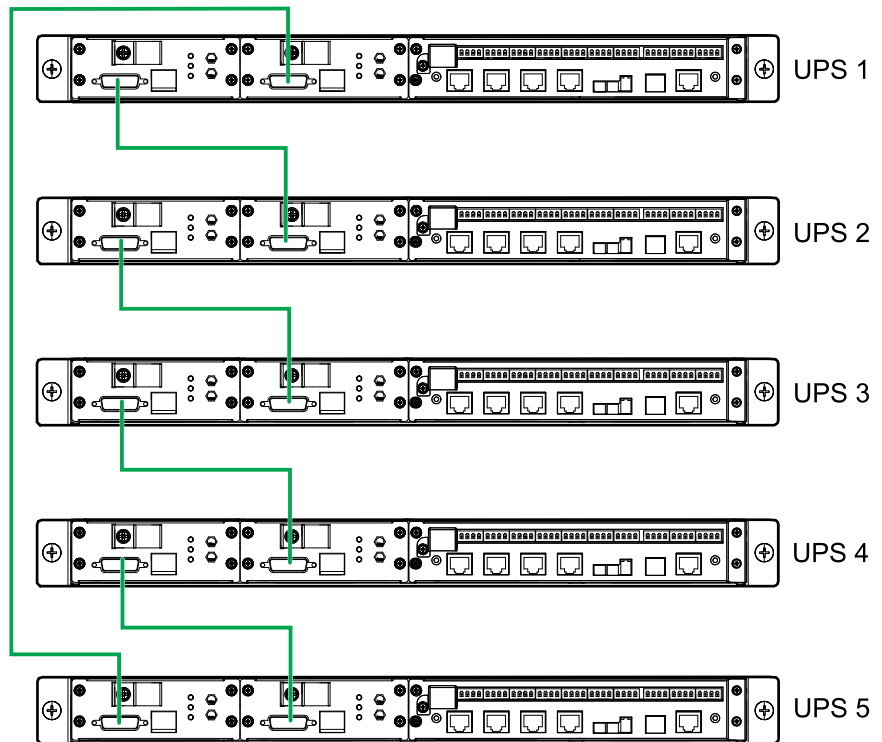
**NOTE:** These signal cables are Class 2/SELV.

| Terminal | Function                           |                            |
|----------|------------------------------------|----------------------------|
| J9-1     | Output relay 1, normally open (NO) | 30 VDC/1 A<br>Class 2/SELV |
| J9-2     | Output relay 1, common             |                            |
| J9-3     | Output relay 2, normally open (NO) |                            |
| J9-4     | Output relay 2, common             |                            |
| J10-1    | Output relay 3, normally open (NO) | 30 VDC/1 A<br>Class 2/SELV |
| J10-2    | Output relay 3, common             |                            |
| J10-3    | Output relay 4, normally open (NO) |                            |
| J10-4    | Output relay 4, common             |                            |
| J11-1    | Output relay 5, normally open (NO) | 30 VDC/1 A<br>Class 2/SELV |
| J11-2    | Output relay 5, common             |                            |
| J11-3    | Output relay 6, normally open (NO) |                            |
| J11-4    | Output relay 6, common             |                            |

## Connect the Parallel Cables in a Parallel System

1. Connect the optional parallel cables between all the UPSs of the parallel system.

**NOTE:** For location of parallel ports see [Communication Interfaces](#), page 27.



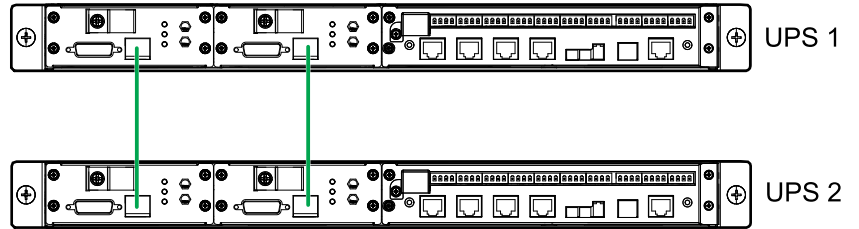
2. Verify the setting of the CAN\_R (for location of CAN\_R see [Communication Interfaces](#), page 27).
  - For parallel systems with  $\leq 4$  parallel UPSs, CAN\_R of all UPSs must be in the ON position.
  - For parallel systems with  $\geq 5$  parallel UPSs, CAN\_R of all UPSs must be in the OFF position.

# Connect the Synchronization Cables between Two UPS Systems

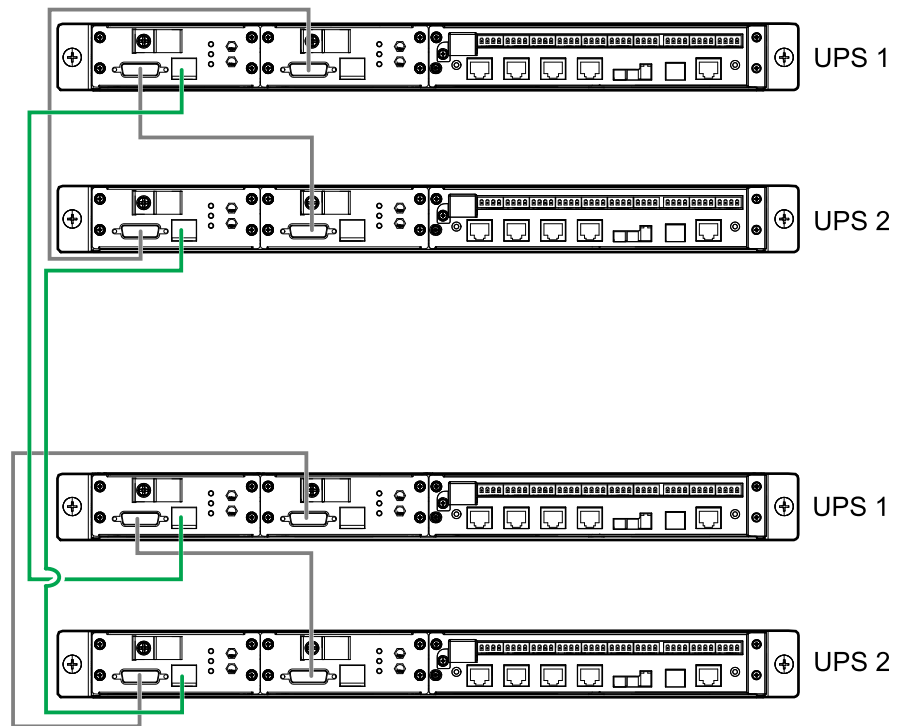
Supports synchronization for up to 2+2 parallel systems.

1. Connect the optional synchronization cables between the UPS systems.

## For Two Single UPS Systems



## For Two Parallel UPS Systems



## Backfeed Protection

### **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) 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.**

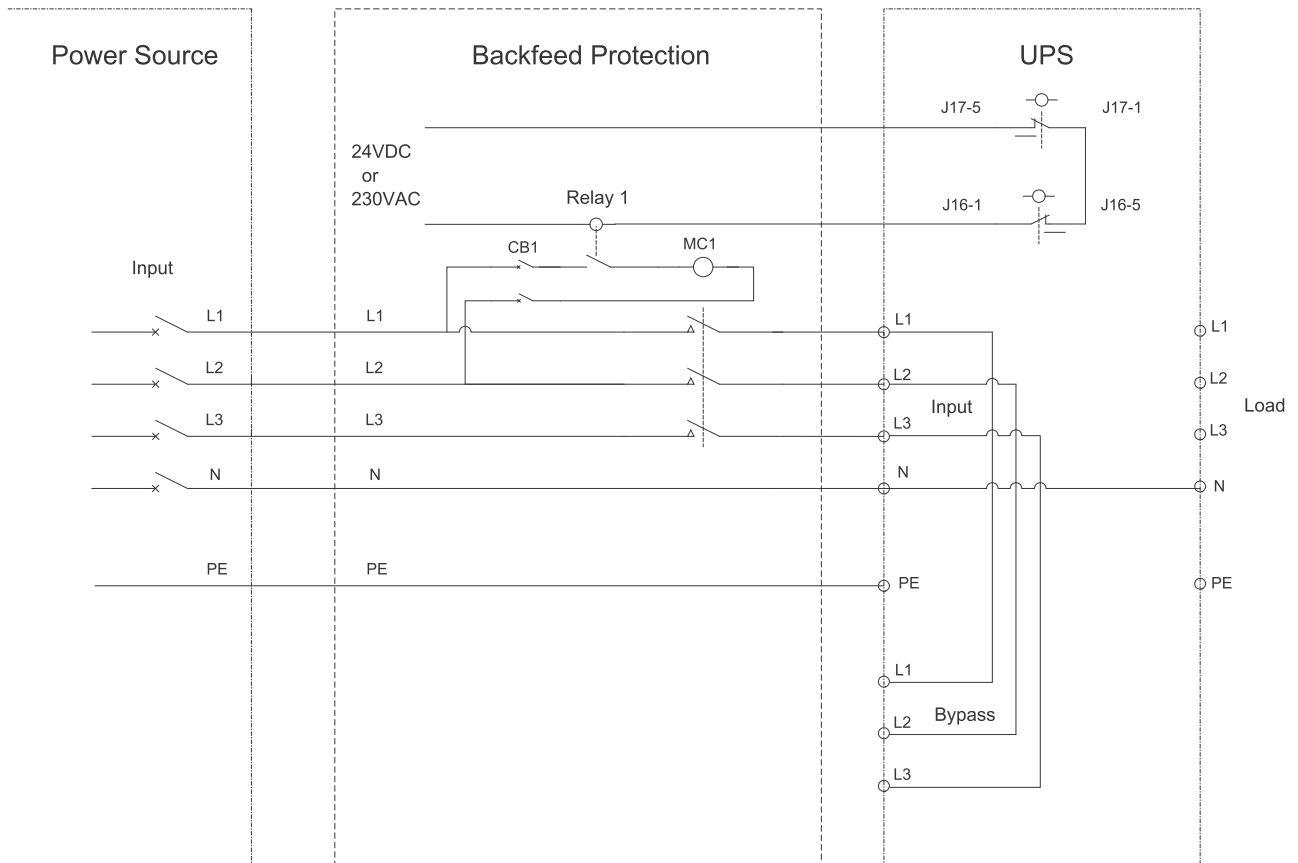
An additional external isolation device must be installed in the UPS system. A contactor can be used for this purpose. In the shown examples, the isolation device is a contactor (marked with a **MC1** for single mains systems and marked with a **MC1** and **MC2** for dual mains systems).

The isolation device must be able to withstand the electrical characteristics as described in the input specifications.

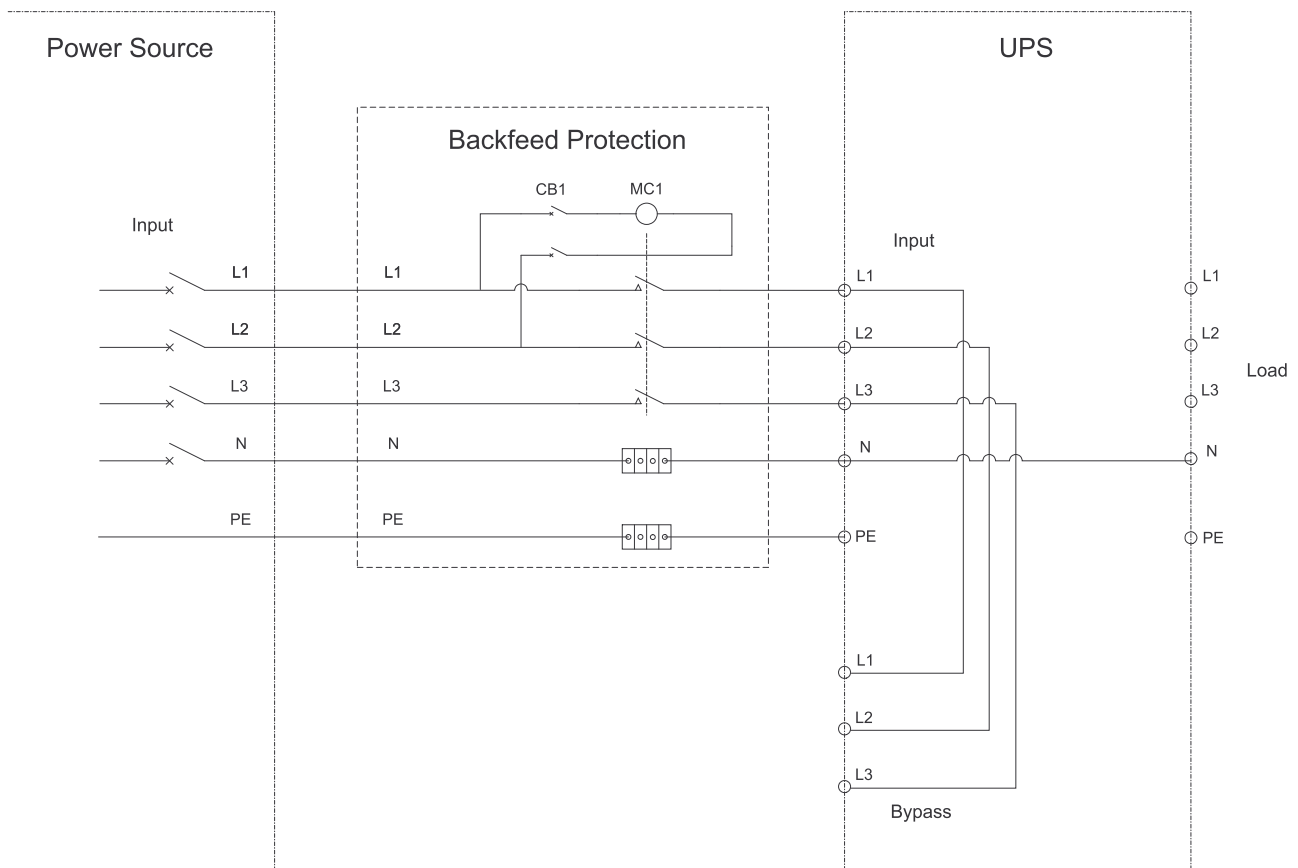
**NOTE:** The 24 VDC/230 VAC source should be generated from the switchgear input source in single mains configurations and from both the switchgear input and bypass source in dual mains configurations.

**NOTE:** The backfeed box in the diagrams is a customized device – please contact Schneider Electric for details.

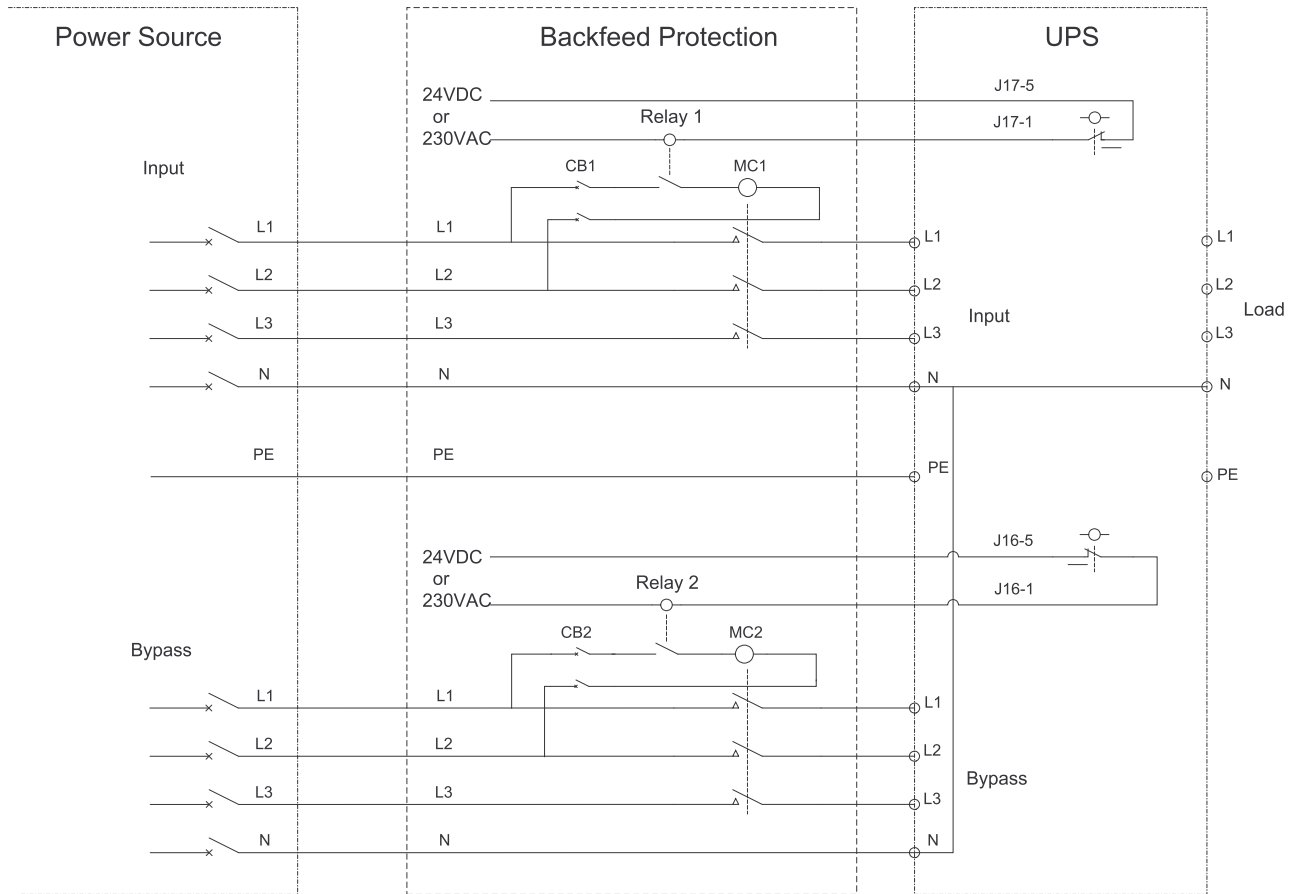
### Single Mains UPS and External Isolation Device



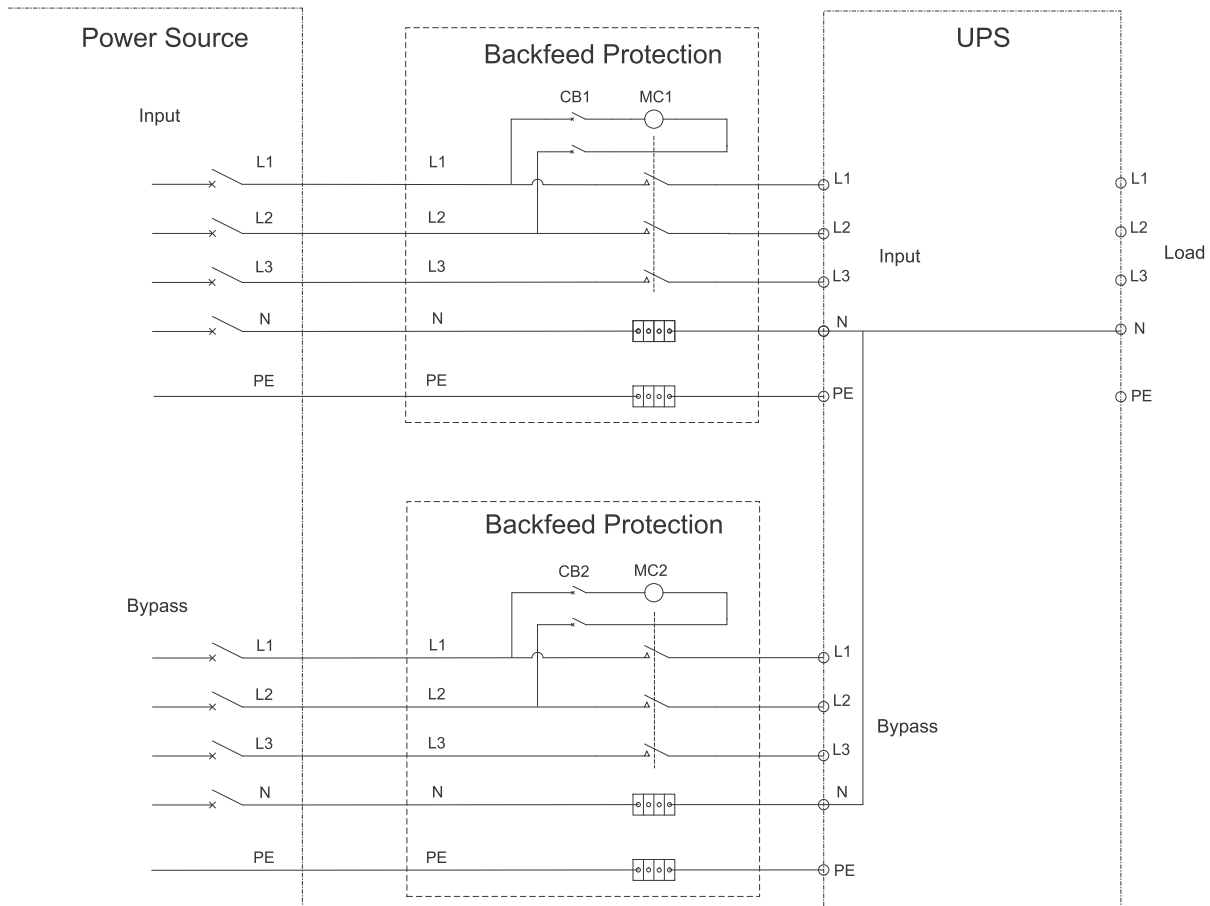
### Single Mains UPS with Backfeed Box



**Dual Mains UPS and External Isolation Device**

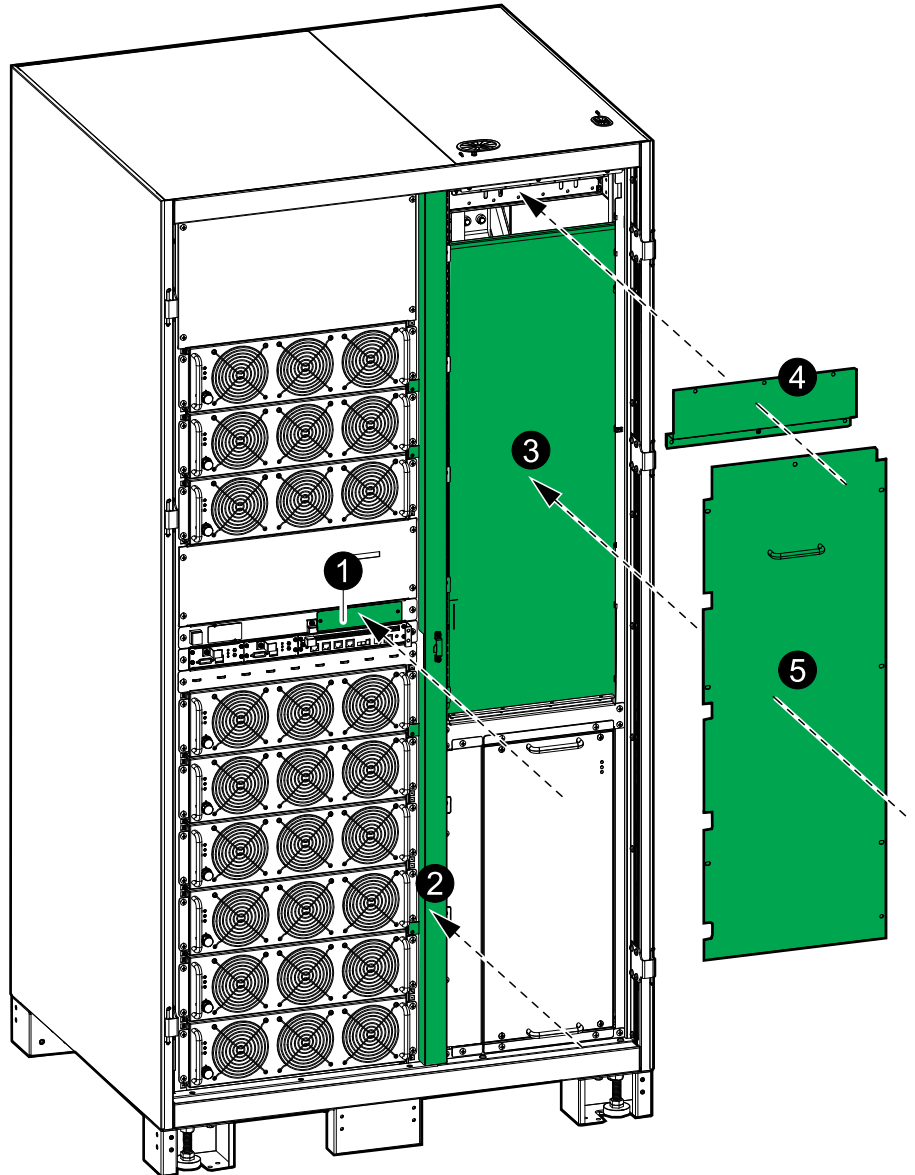


**Dual Mains UPS with Backfeed Box**



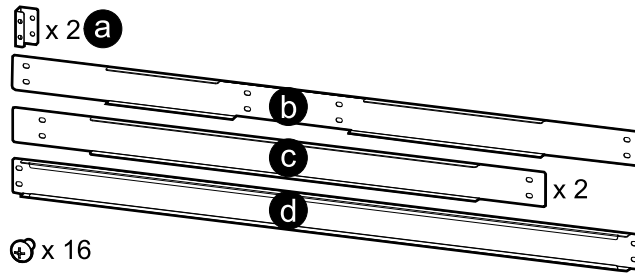
# Final Installation

1. Reinstall the protection cover in front of the non-Class 2/non-SELV terminals.
2. Reinstall the signal cable cover.
3. Reinstall the protection cover.
4. Reinstall the upper plate.
5. Reinstall the lower plate.

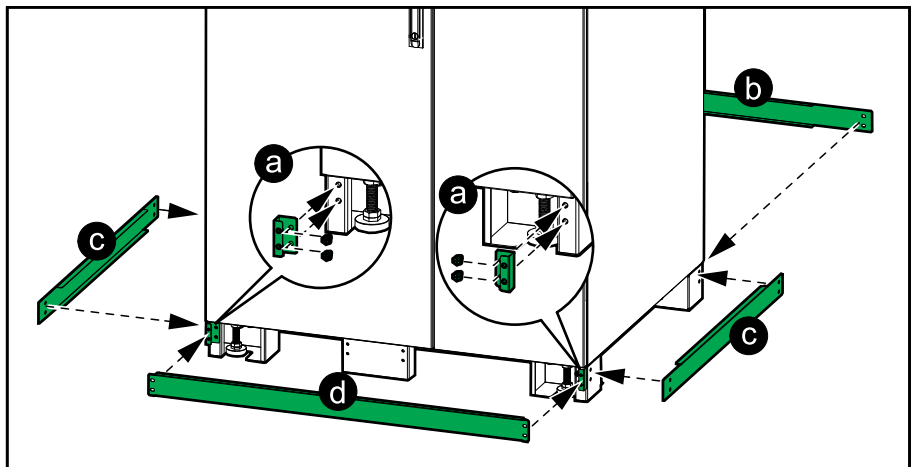


## 6. Install the kick plates:

**NOTE:** The kick plate parts are delivered in the UPS packaging.



- Install the two brackets on the right and left front feet.
- Install the rear kick plate.
- Install the side kick plates.
- Install the front kick plate.



## 7. Close the doors.



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France

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\* 9 9 0 - 6 2 9 0 B - 0 0 1 \*

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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