



MAINTENANCE BYPASS CABINET (MBC)

WITH BACK FEED PROTECTION
AND STEP-DOWN CAPABILITY

USER MANUAL

MBC45ITCT

SAVE THESE INSTRUCTIONS

Please read this manual and follow the instructions for installation and operation.

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1 - SAFETY INSTRUCTIONS

1.1 Safety Warnings

Read these instructions carefully and become familiar with the equipment before attempting to install, operate, service, or maintain it.

Safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to highlight information that clarifies or simplifies a procedure.

Symbol	Description
	DANGER Indicates an electrical hazard that will result in death or serious injury if the instructions are not followed.
	WARNING Indicates a hazardous situation that could result in death or serious injury if the instructions are not followed.
	CAUTION Indicates a hazardous situation that could result in minor or moderate injury, or equipment damage, if the instructions are not followed.
	NOTICE Addresses practices not related to physical injury. Failure to follow these instructions can result in equipment damage.

Installation, operation, service, and maintenance of this product shall be performed only by qualified personnel. Qualified personnel shall have the skills and knowledge related to the construction, installation, and operation of electrical equipment, and shall have received safety training to recognize and avoid hazards.

1 - SAFETY INSTRUCTIONS

1.2 Safety Information and Installation Warnings



DANGER — Do Not Install in Hazardous Environments

This equipment is not intended for use in areas with extreme or hazardous conditions. Do not install it in locations with:

- Explosive gasses or dust
- Corrosive fumes
- High humidity, steam, or mold
- Insect or rodent infestations
- Salt-laden air or polluted refrigerants
- Excessive vibration, physical shock, or tilting
- Direct exposure to sunlight or electromagnetic interference

Failure to install the equipment in a suitable environment may result in severe injury or equipment damage.



DANGER — Environmental Site Conditions Must Be Met

Install the system indoors in a clean, controlled environment. Ensure the installation surface is flat, fire-resistant, such as concrete, and strong enough to support the full weight of the equipment. Do not install the system in areas with conductive dust or high moisture.

Ignoring these requirements could result in electric shock or system failure.



DANGER — Electrical Shock, Arc Flash, or Explosion Risk

Before beginning any installation, all safety instructions in the documentation shall be read thoroughly and clearly understood.

Disregarding safety precautions can lead to fatal injury.

1 - SAFETY INSTRUCTIONS



DANGER — Begin Installation Only After Site Completion

Do not proceed with equipment installation until site construction is fully finished and the area is completely cleaned.

Working in an unfinished or unclean space significantly increases the risk of electrical hazards and personal injury.



DANGER — Follow Manufacturer's Installation Specifications

This product shall be installed strictly according to the manufacturer's instructions. Ensure correct application of upstream circuit protection, battery disconnect devices, cable sizing, and environmental conditions.

Failure to comply voids manufacturer responsibility and can result in serious injury or equipment failure.



DANGER — Avoid Unauthorized Mechanical Modifications

Do not drill or cut any part of the enclosure or conduit entry areas while gland plates are installed. Avoid placing holes near the UPS system.

Unauthorized modifications may compromise safety and lead to injury.



WARNING — Arc Flash Hazard

Do not remove panels or mechanically modify the unit unless explicitly instructed in the official installation documentation.

Improper handling can result in electric shock, serious injury, or equipment malfunction.

1 - SAFETY INSTRUCTIONS



DANGER — Compliance with Local Electrical Codes Required

The system shall be installed in accordance with applicable local and national regulations. Refer to the following, as applicable:

- IEC 60364 series, including electric shock, thermal, and overcurrent protection
- NFPA 70 (NEC), for installations in the U.S.
- Canadian Electrical Code (C22.1, Part 1), for installations in Canada

Failure to comply may result in legal liability and severe injury.



NOTICE — Maintain Airflow and Cooling

Ensure the equipment has adequate clearance for ventilation. Do not block any air inlets or outlets while the system is operating.

Restricted airflow may lead to overheating and reduce equipment lifespan.



DANGER — Post-Installation Site Work Precautions

If additional construction or maintenance is required after the UPS is installed, power off the equipment completely. Cover it using the original protective packaging to prevent contamination or damage.

Operating the unit during ongoing construction is extremely hazardous and may result in fatal outcomes.

1 - SAFETY INSTRUCTIONS

1.3 Electrical Safety

- Electrical equipment shall be installed, operated, serviced, and maintained only by qualified personnel.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- AC and DC disconnection devices shall be provided by others, shall be readily accessible, and shall be clearly marked for their function.
- Turn off all power supplying the product before working on or inside the equipment.
- Before working on the product, check for hazardous voltage between all terminals, including protective earth.

1.4 Battery Safety

- Battery circuit breakers shall be installed according to specifications.
- Servicing of batteries shall be performed or supervised only by qualified personnel knowledgeable of batteries and the required precautions.
- Disconnect charging sources prior to connecting or disconnecting battery terminals.
- Do not dispose of batteries in a fire. Batteries may explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.

1.5 Regulatory Compliance Statements

- This Maintenance Bypass Cabinet (MBC), featuring integrated transformer functionality, backfeed protection, and step-down capability, is an optional accessory designed for use with UPS systems.
- It has been tested in conjunction with a UPS by an independent third-party laboratory and found to comply with the safety and performance requirements of UL 1778.
- The product is also cULus certified, demonstrating compliance with applicable standards in both the United States and Canada.
- These certifications confirm the product's suitability for safe, reliable operation in commercial environments.

2 - INTRODUCTION

2.1 Product Overview

The CyberPower Maintenance Bypass Cabinet (MBC45ITCT) is a 45 kW cabinet designed for use with CyberPower SM Series Modular UPS systems (SM 20K and SM 40K). It integrates an isolation step-down transformer and a maintenance bypass switching assembly in a single enclosure.

2.2 Key Features

Dual-Voltage Input (Exclusive Selection)

Provides dedicated input interfaces for 480 V (3-Phase, 3-Wire) or 600 V (3-Phase, 3-Wire) utility systems. Only one input source shall be connected and used for a given installation; concurrent connection and/or use of both input interfaces is prohibited. The internal isolation transformer provides a 120/208 V (3-Phase, 4-Wire) output via the internal busbars for downstream distribution.

Integrated Maintenance Bypass

Includes a built-in bypass switch to electrically isolate the UPS for scheduled maintenance or module replacement while supporting continuity of power delivery to the connected load when operated in accordance with the specified procedures.

Safety Signal Interlock

The bypass switch incorporates a protective guard with an integrated microswitch. Removing the guard initiates a control signal to the UPS to transfer to static bypass prior to manual switch actuation, helping align system operating state and reduce the risk of improper transfer.

Vertical Stacked Configuration (Recommended)

Designed as a base cabinet to support a vertical stacked configuration, with the SM Series UPS mounted directly on top to form a consolidated, single-tower installation.

Thermal Management and Protection

Provides active cooling using three internal fans and thermal sensing for over-temperature protection. An initial over-temperature condition can generate an alarm via the optional network interface and ambient sensor; if temperature exceeds the protection threshold, the system may initiate a protective trip to prevent hardware damage.

2 - INTRODUCTION

2.3 System Overview and Architecture

The MBC45ITCT is installed as part of the UPS power system to support maintenance bypass operation. In the normal power path, the MBC is supplied from the UPS output and provides a 120/208 V (3-Phase, 4-Wire) output interface via the internal busbars for connection to customer-provided downstream distribution equipment (e.g., a distribution panelboard).

For site utility compatibility, the MBC provides exclusive input selection: 480 V (3-Phase, 3-Wire) or 600 V (3-Phase, 3-Wire). Only one input interface shall be used for a given installation; concurrent connection and/or use of both input interfaces is prohibited.

Device and breaker nomenclature is defined in Table 2-1, and system logic is illustrated in Fig. 2-1 (Logic Block Diagram).

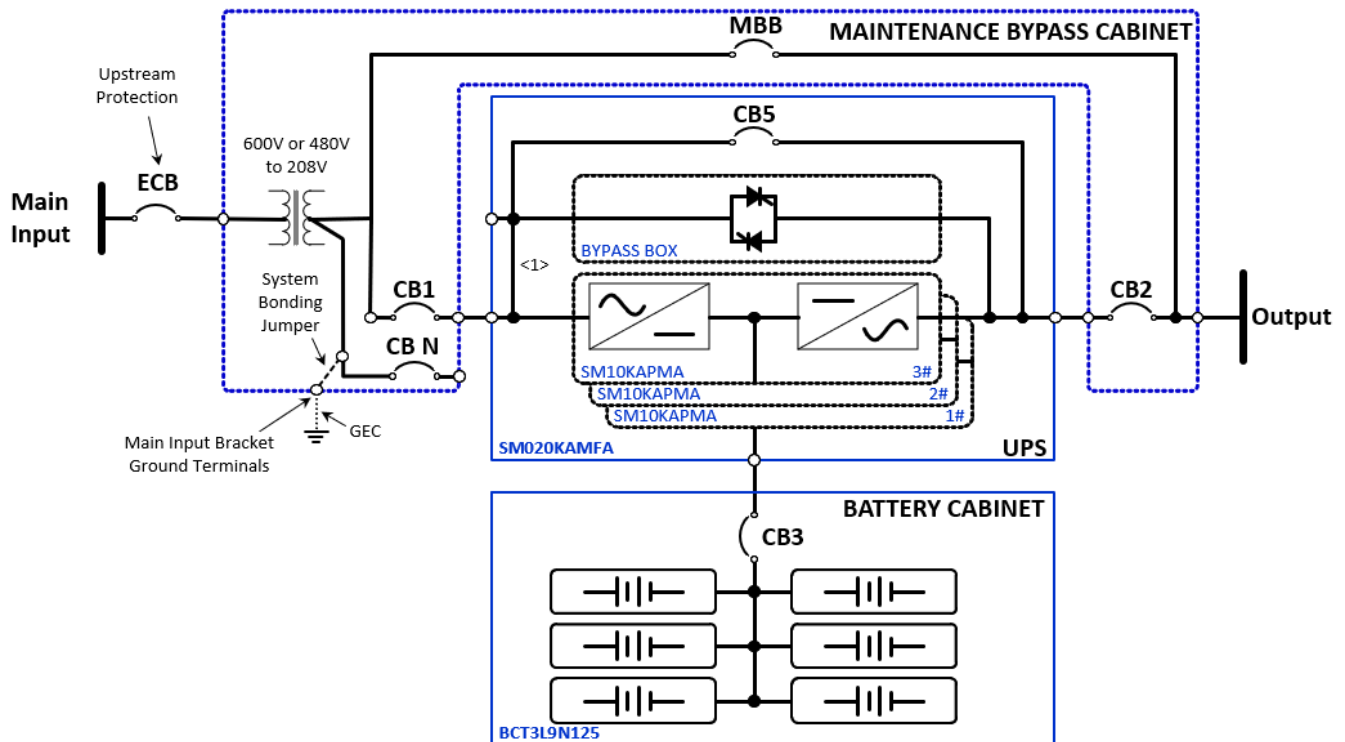


Fig. 2-1: MBC45ITCT Logic Block Diagram

2 - INTRODUCTION

Abbreviations and Acronyms	
Abbreviation / Tag	Meaning
AC	Alternating Current
DC	Direct Current
MBC	Maintenance Bypass Cabinet
UPS	Uninterruptible Power Supply
CB	Circuit Breaker
CB1	MBC UPS Input Isolation Breaker
CB2	MBC Load Output Breaker
MBB	Maintenance Bypass Breaker
CB N	Neutral Disconnect Breaker
ECB	External Circuit Breaker (Upstream Protection)
CB5	UPS Internal Maintenance Bypass Breaker
CB3	Battery Cabinet Output Breaker
OTP	Over Temperature Protection
SCR	Silicon Controlled Rectifier (Static Bypass Switch device)
PE	Protective Earth
N	Neutral
SBJ	System Bonding Jumper
GEC	Grounding Electrode Conductor
EMC	Electromagnetic Compatibility
SNMP	Simple Network Management Protocol
RMCARD205	Remote Management Card model (SNMP interface)

2 - INTRODUCTION

2.4 Major Components and Port Definitions

This section identifies the major components referenced throughout this manual.

Port names (AC INPUT PORT / UPS INPUT PORT / UPS OUTPUT PORT / AC OUTPUT PORT) refer to the connection points labeled in the system diagrams. Device names and abbreviations follow Table 2-1.

Table 2-1: Device and Breaker Nomenclature

Abbreviation / Tag	Meaning
CB1	MBC UPS Input Isolation Breaker
CB2	MBC Load Output Breaker
MBB	Maintenance Bypass Breaker
CB N	Neutral Disconnect Breaker
ECB	External Circuit Breaker (Upstream Protection)
CB5	UPS Internal Maintenance Bypass Breaker
CB3	Battery Cabinet Output Breaker

2.4.1 Switching and Protection Devices (Simplified)

CB1 - MBC UPS Input Isolation Breaker

Located between the transformer secondary and the UPS INPUT PORT; isolates/protects this path.

CB2 - MBC Load Output Breaker

Located between the UPS OUTPUT PORT and the AC OUTPUT PORT; disconnects the internal output path to the load/distribution side.

MBB - Maintenance Bypass Breaker

Provides the maintenance bypass switching path as defined in the operating procedures.

CB N - Neutral Disconnect Breaker

Isolates the neutral conductor for maintenance/testing as specified in the applicable procedure.

ECB - External Circuit Breaker (Upstream Protection)

Customer-provided upstream protection device installed ahead of the isolation transformer (refer to Appendix A — A.2 Recommended Upstream Protection).

CB5 - UPS Internal Maintenance Bypass Breaker

UPS internal maintenance bypass breaker; position/lockout requirements are specified in the wiring/commissioning/operation sections.

CB3 - Battery Cabinet Output Breaker

System breaker associated with the battery cabinet output (refer to UPS/battery documentation as applicable).

2 - INTRODUCTION

2.4.2 Power Path Hardware

AC INPUT PORT (480 V / 600 V, 3-Phase, 3-Wire):

Cabinet utility input connection (exclusive selection).

Isolation Transformer (Primary/Secondary):

Provides step down isolation from the cabinet input to the UPS input path.

UPS INPUT PORT:

Cabinet connection point to the UPS input.

UPS OUTPUT PORT:

Cabinet connection point from the UPS output (normal power source).

AC OUTPUT PORT:

Cabinet output connection point to customer provided downstream distribution equipment.

2.4.3 Monitoring and Signal Interlock

Protective Guard with Integrated Microswitch:

Provides signal interlock prior to manual bypass switching.

Cooling Fans (x3) and Over Temperature Sensor:

Supports thermal management and over temperature protection.

2.5 Options and Accessories Overview

Some items referenced in this manual are supplied as standard accessories, while others may be supplied only when ordered. Standard accessories include hardware intended to support specific installation methods (for example, rear cable entry routing hardware used in Section 6.3).

Optional accessories may be supplied depending on the order configuration. For example, the environmental option SNEV001 is used for environmental/transformer-related monitoring and alerting in conjunction with the monitoring configuration procedures.

Verify delivered items during receiving inspection in Section 4.3, Package Contents. When remote monitoring and alert notification are used, configure the applicable functions in Section 6.4, Operational Settings for Remote Monitoring and Alerts.

3 - PLANNING AND SITE REQUIREMENTS

Before delivery, unloading, installation, or commissioning, confirm that the installation site is suitable for the MBC45ITCT and its associated UPS system. Planning shall be completed in advance to ensure safe handling, adequate ventilation, sufficient maintenance access, and compliance with the installation requirements specified in this manual.

Detailed electrical ratings, recommended upstream protection, cable sizes, lug sizes, torque values, dimensions, and additional environmental specifications are provided in Appendix A.

3.1 Site Requirements and Operating Environment

Install the system indoors in a clean, controlled environment. Ensure the installation surface is flat, fire-resistant (such as concrete), and strong enough to support the weight of the equipment. Do not install in areas with conductive dust or high moisture.

Operating environment limits for planning purposes are as follows:

- Operating Temperature: 0 °C to 40 °C
- Relative Humidity: 0-95% non-condensing
- Altitude: 0-3000 meters

The equipment shall not be installed in hazardous or unsuitable environments as defined in Section 1.2, Safety Information and Installation Warnings.



NOTICE — Maintain Airflow and Cooling

Ensure the equipment has adequate clearance for ventilation. Do not block any air inlets or outlets while the system is operating. Restricted airflow may lead to overheating and reduce equipment lifespan.

Refer to Appendix A for full environmental specifications, including storage conditions and protection class.

3 - PLANNING AND SITE REQUIREMENTS

3.2 Clearance and Service Access

Adequate clearance shall be provided around the equipment for ventilation, cable routing, installation work, and future maintenance access. Space requirements are specified for ventilation and maintenance access only. Refer to local safety regulations and standards for any additional requirements specific to your region.

Reference illustration: Fig. 3-1, Front View of the UPS and the Maintenance Bypass Cabinet.

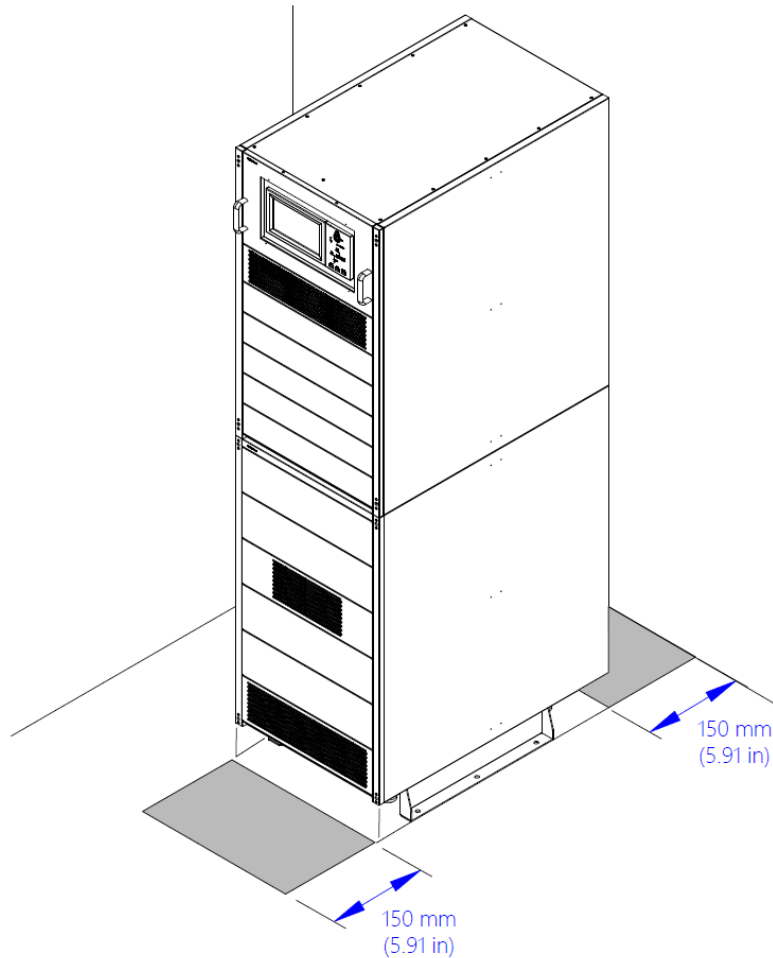


Fig. 3-1: Front View of the UPS and the Maintenance Bypass Cabinet

3 - PLANNING AND SITE REQUIREMENTS

3.3 Handling, Weight, and Space Planning

Use the cabinet dimensions and equipment weight to plan handling equipment, transport route, and staging space before installation. Physical data are provided in Appendix A and the reference drawings.



CAUTION — Handling and Staging Constraints

- Do not tilt the cabinet more than 10° from vertical during handling/unloading.
- When removing the cabinet from the pallet, allow a minimum clearance of 3 m on each side for removal operations.

Reference drawing: Fig. 3-2, MBC45ITCT Dimensions (Front and Right-Side Views).

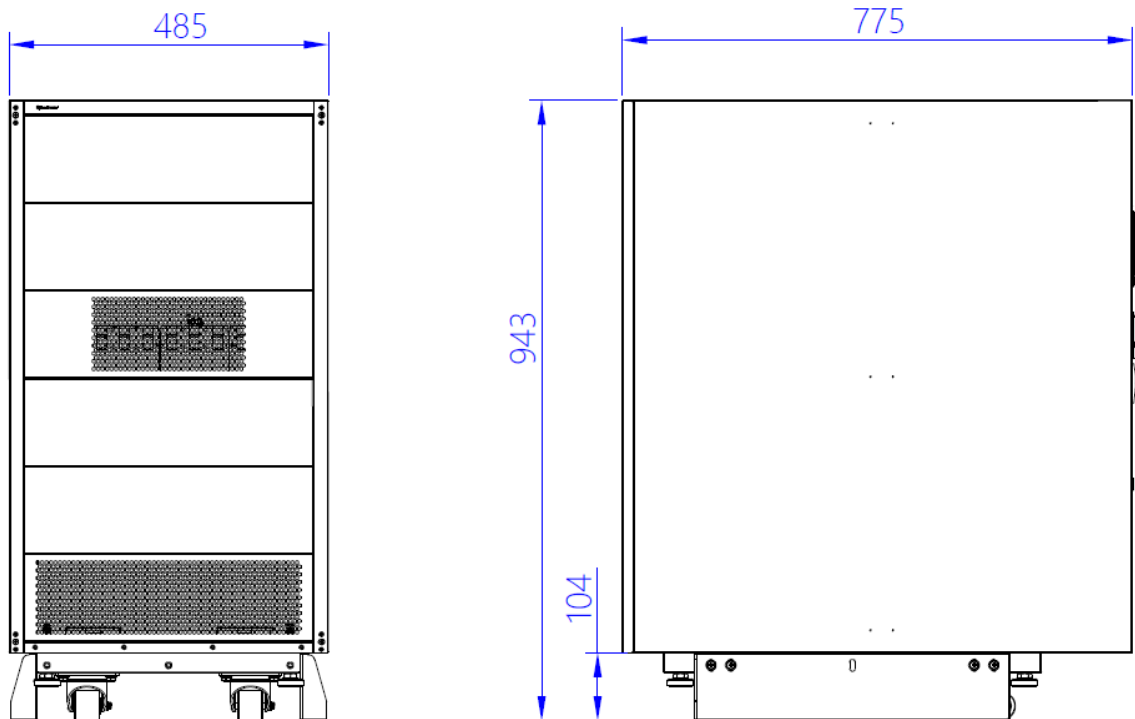


Fig. 3-2: MBC45ITCT Dimensions (Front and Right-Side Views)

3 - PLANNING AND SITE REQUIREMENTS

3.4 Required Tools and Equipment

Prepare handling equipment and tools referenced in the receiving/unpacking and installation procedures. Tools shown in the procedures include:

- Forklift or pallet jack (rated for cabinet weight).
- 8 mm socket (for wood crate bolt removal).
- 13 mm socket wrench (recommended).
- 16 mm socket wrench and 17 mm open-end wrench (recommended).
- Wrench (for leveling feet) and bubble level (for horizontal alignment).
- Torque tools for terminal and hardware tightening.
- Electrical measuring instruments for installation verification.

3.5 Kits, and Cable Entry Selection

Before installation, verify the order configuration and confirm all applicable options, accessories, and installation constraints.

3.5.1 Seismic Kit

The hole diameter is marked as $\Phi 12$, which requires using M12 expansion bolts or anchor bolts with a 12 mm outer diameter. Refer to Fig. 3-3, Floor Mounting Dimensions for Side Installation of MBC45ITCT, for the floor mounting hole pattern and anchor point locations.

3.5.2 Cable Entry Selection

All power cables (input, load, and DC) must be routed through the bottom of the MBC. Top cable entry is not supported. To prevent EMC interference, input, load, and DC cables must be routed separately; cable ties are recommended to secure routing. Detailed steps are provided in the wiring section.

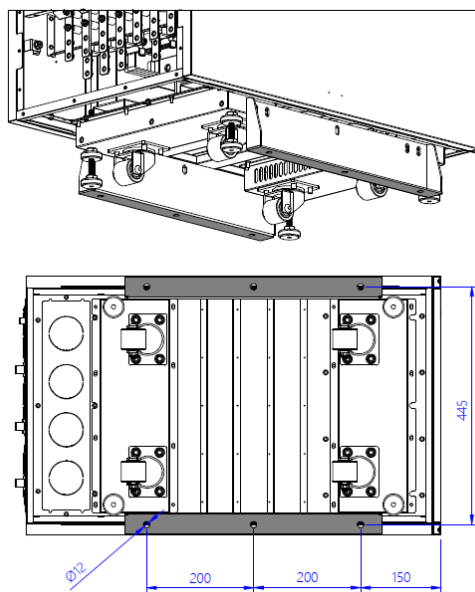


Fig. 3-3: Floor Mounting Dimensions for Side Installation of MBC45ITCT

4 - RECEIVING, UNPACKING AND INSPECTION

4.1 Receiving Inspection

Upon receipt, inspect the shipping materials for any signs of damage or mishandling. If any damage is noted, contact CyberPower and file a damage claim with the shipping agency within 24 hours.

Carefully inspect the outer packaging for evidence of damage during transit.

4.2 Unpacking Procedure

Do not unpack the cabinet before the time of installation. Ensure the floor is level and can support the weight of the cabinet.

Unpack all packaging materials, retrieve the installation kits, and save the protective packaging bag for future use.

The cabinet is shipped bolted to a wooden pallet and covered with outer protective packaging material.



WARNING — Heavy Cabinet / Tip Hazard

The maintenance bypass cabinet is heavy. Refer to Appendix A for cabinet weight information. If unpacking and unloading instructions are not closely followed, the cabinet may tip and cause serious injury.

WARNING — Handling Equipment Rating

For the following steps, verify that the forklift or pallet jack is rated to handle the weight of the cabinet.

Perform the unpacking steps below:

1. Carefully inspect the outer packaging for evidence of damage during transit.
2. Use a forklift or pallet jack to move the packaged cabinet to the installation site, or as close as possible, before unpacking. If possible, move the cabinet using the pallet. Insert the forklift or pallet jack forks between the supports on the bottom of the pallet.

CAUTION — Do Not Tilt

Do not tilt the cabinet more than 10° from vertical. Damage may occur when lifting the cabinet with a forklift.

3. Set the pallet on a firm, level surface, allowing a minimum clearance of 3 m on each side for removing the cabinet from the pallet.
4. Remove the 36 bolts that secure the wood crates (8 mm socket recommended). See Fig. 4-2.
5. Remove the protective packaging material from the cabinet and recycle in a responsible manner.

4 - RECEIVING, UNPACKING AND INSPECTION

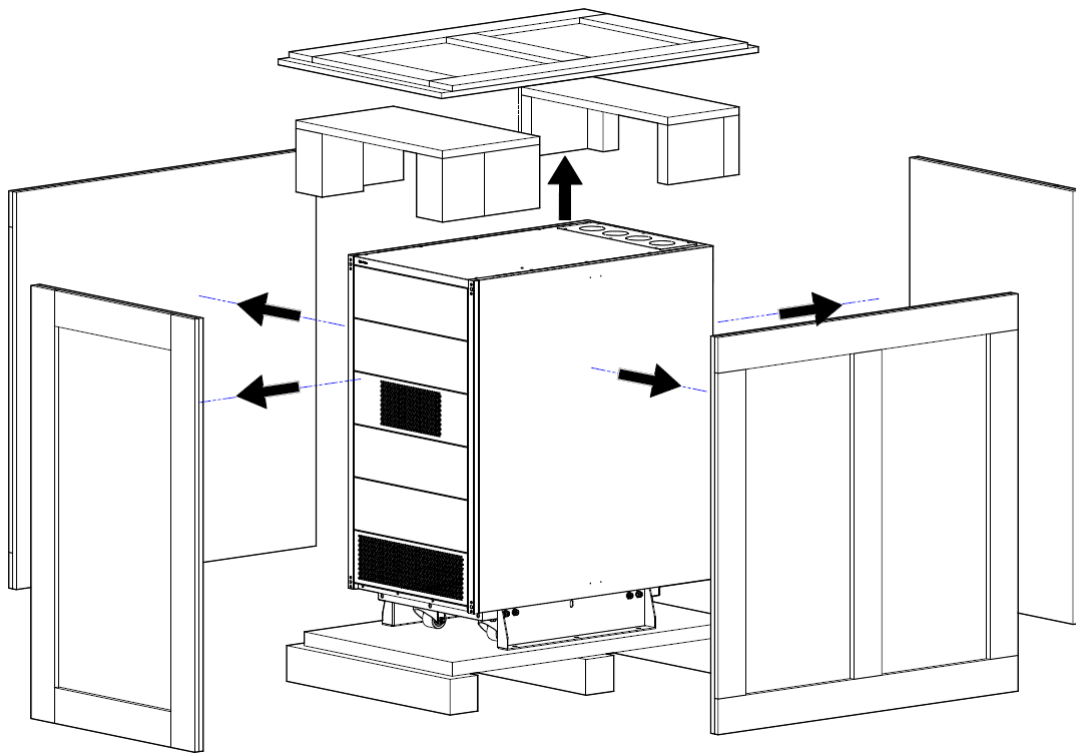


Fig. 4-2: Removed the Wood Crates of MBC45ITCT



NOTICE

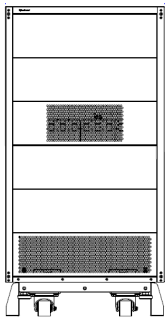
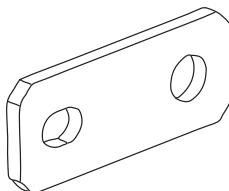
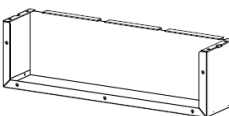
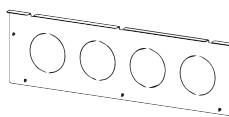
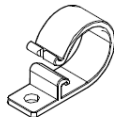
After the wooden crate is removed and receiving inspection is complete, the cabinet may remain secured to the pallet for internal transport. Refer to Section 5.1 for instructions on unloading the cabinet from the pallet and moving it into its final installation position.

4 - RECEIVING, UNPACKING AND INSPECTION

4.3 Package Contents

Inspect the contents and compare each item with the Bill of Lading.

Table 4-1: Standard Package Contents

No.	Item	Qty	Notes / Used In	Drawing
1	MBC45ITCT	1	Main cabinet unit	
2	User Manual	1	Printed manual	
3	System Bonding Jumper (SBJ) Copper Busbar	1	Used for the required neutral-to-ground bonding (N PE/ SBJ) when specified by wiring/ grounding requirements and applicable site code.	
4	Ext. Conn. Box	1	Used for rear cable entry routing	
5	Ext. Conn. Cover	1	Cover plate for Ext. Conn. Box after wiring is completed	
6	Cable Clamp	4	Secures and strain-relieves signal/control wiring	
7	Pan Head Phillips Screw, M4x8, Black	5	Attaches the junction box and cover to the UPS	

4 - RECEIVING, UNPACKING AND INSPECTION

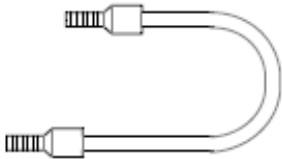
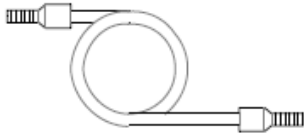
No.	Item	Qty	Notes / Used In	Drawing
8	Hex Head Screw, M6×15, Black	1	Hardware kit	
9	Hex Head Screw, M8×18, Silver	50	Power conductor/busbar termination hardware in the power wiring compartment	
10	WIRE 22AWG 22cm BRN UL1015	1	This wire is used when the optional SNEV001 is selected. It is applied for internal wiring connections associated with the SNEV001 configuration.	
11	WIRE 22AWG 22cm BLU UL1015	1		
12	WIRE 22AWG 130cm WHT UL1015	2	These cables are used for control signal connections between the MBC and the UPS, supporting transformer temperature monitoring, backfeed protection, and maintenance bypass interlocking, and ensuring proper system protection and status monitoring.	
13	WIRE 22AWG 130cm BLK UL1015	1		
14	WIRE 22AWG 130cm RED UL1015	1		

Table 4-2: Optional Parts

1	SNEV001	1	Environmental monitoring accessory
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4.4 Inspection for Shipping Damage

Inspect the contents for any evidence of physical damage and compare each item with the Bill of Lading. If damage has occurred or shortages are evident, contact the service representative immediately to determine the extent of the damage and its impact on further installation.

If any damage is noted, contact CyberPower and file a damage claim with the shipping agency within 24 hours.

After unpacking and inspection are complete, proceed to Section 5.1 to unload the cabinet from the pallet and move it into its final installation position.

5 - INSTALLATION

Mechanical and Electrical Integration

Installation shall be performed only by qualified personnel familiar with the UPS system and the required precautions.

This chapter begins after the outer packaging and wooden crate have been removed and the package contents have been verified in accordance with Chapter 4.

Before installation, refer to Appendix A for cabinet dimensions, equipment weight, cable sizes, lug sizes, torque values, and related installation notes.

Do not tilt the cabinets more than 10° during installation.

Installation overview:

- Prepare the Maintenance Bypass Cabinet (MBC), the UPS, and the Battery Cabinet for cable installation.
- Stack the UPS and the MBC for installation.
- Connect the interconnection wiring between the UPS and the MBC.
- Connect the signal cables.
- Connect the power source and load cables to the appropriate terminals in the MBC.
- Complete the final installation steps.

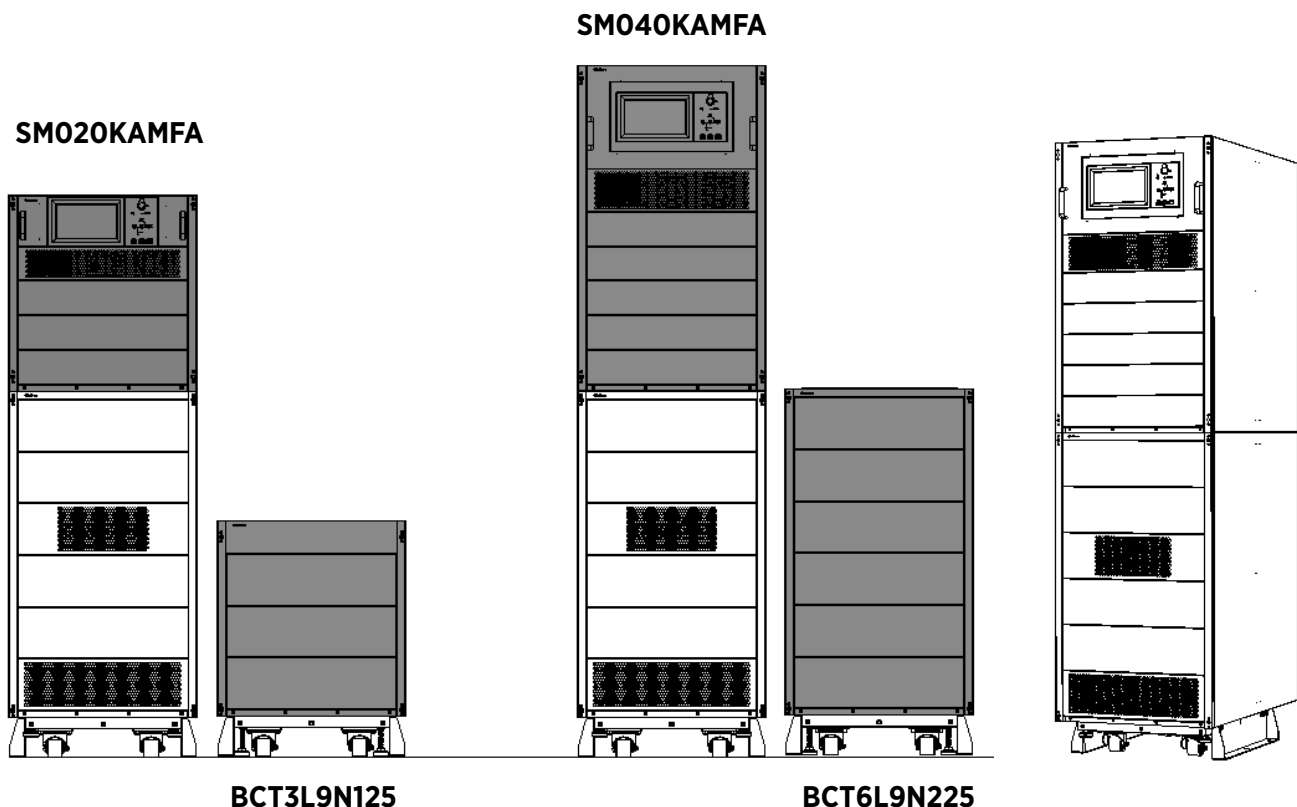


Fig. 5-1: System Overview

5 - INSTALLATION

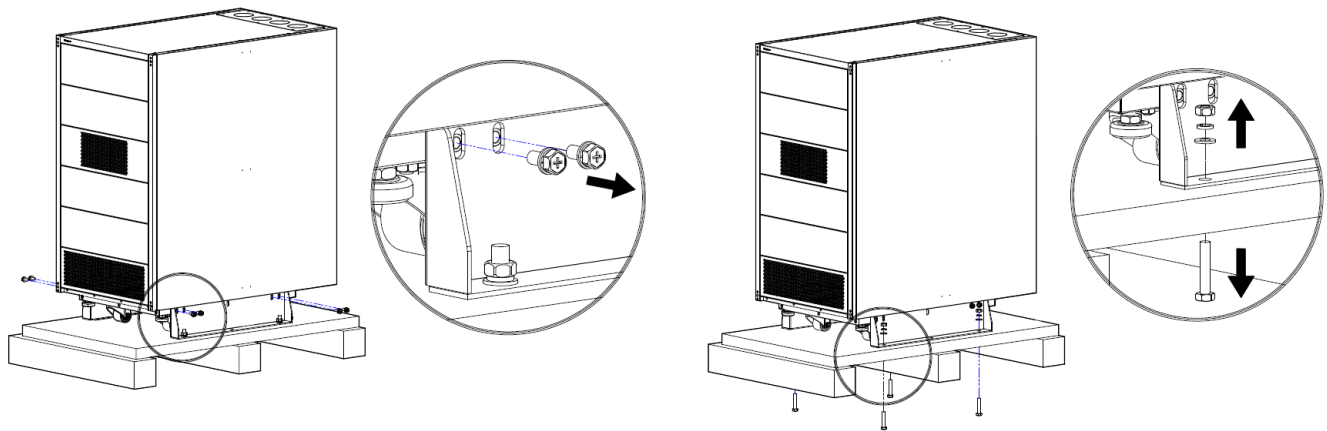
5.1 Unloading and Moving the Cabinet

	WARNING — Heavy Cabinet / Tip Hazard The maintenance bypass cabinet is heavy. Refer to Appendix A for cabinet weight information. If unloading instructions are not closely followed, the cabinet may tip and cause serious injury.
	WARNING — Handling Equipment Rating Verify that the forklift or pallet jack is rated to handle the weight of the cabinet. The maintenance bypass cabinet is bolted to a wooden pallet supported by wood skids.
	CAUTION — Unloading Area Requirements Ensure a minimum of 3 m in front of the cabinet for unloading. The area in front of the cabinet must be unobstructed. The unloading floor must be smooth, with no cracks or large seams to ensure a smooth roll-off of the cabinet.
	NOTICE — The procedure shown is for the MBC45ITCT. The procedure for the BCT6L9N225 is identical.

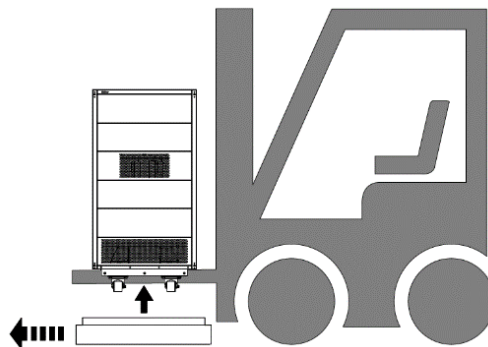
To unload the maintenance bypass cabinet from the pallet:

- 1) If not already accomplished, use a forklift or pallet jack to move the cabinet to the installation area, or as close as possible, before unloading from the pallet. Insert the forklift or pallet jack forks between the supports on the bottom of the pallet.
- 2) If the leveling feet are not fully retracted, turn all four leveling feet until they are retracted into the cabinet.
- 3) Remove the bolts securing the left and right shipping brackets to both the cabinet and the pallet, then remove the shipping brackets on both sides. If the cabinet is being permanently installed, retain the brackets and their mounting hardware for future use.
- 4) Using a 13 mm socket wrench (recommended), remove the bolts securing the side brackets to the cabinet.
- 5) Using a 16 mm socket wrench and a 17 mm open-end wrench (recommended), remove the four bolts securing the brackets to the pallet.

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- 6) Verify again that the leveling feet are fully retracted.
- 7) Lift the cabinet using a forklift, remove the pallet, then gently lower the cabinet. Use the casters on the bottom of the cabinet to roll it into the final installation position, placing it beneath the UPS cabinet as applicable. Ensure that the front doors of both cabinets are properly aligned and flush.



WARNING — Stand Clear

Do not stand directly in front of or behind the pallet while unloading the cabinet. If unloading instructions are not closely followed, the cabinet may cause serious injury.

If the cabinet is to be permanently installed, retain the shipping brackets and related hardware for future use. Otherwise, dispose of the pallet and brackets in accordance with local recycling regulations.



WARNING — Leveling Feet Use

Use leveling feet only to lock the cabinet in place. Do not use the leveling feet to raise the cabinet.

Secure the maintenance bypass cabinet in position by lowering the leveling feet until the cabinet is locked in place.

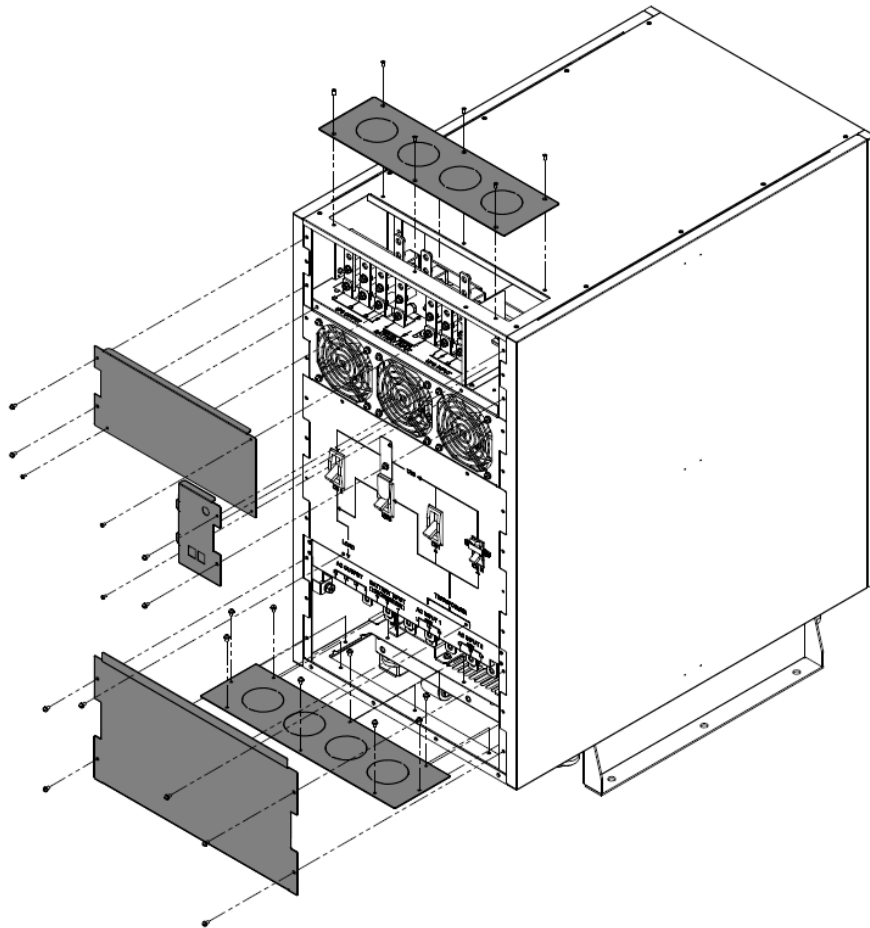
5 - INSTALLATION

5.2 Cabinet Preparation for Cable Installation

Remove the following components from the maintenance bypass cabinet for cable preparation:

- Back panel
- Input and output wiring cover plates
- Communication cover plates
- Gland plate at the required bottom cable-entry location

On the removed cable-entry gland plate, remove the laser pre-cut opening/knockout (64 mm) and install a cable gland or conduit fitting as required (conduit to be provided by others; compatible cable gland models include PG 48 or CAG 63).



After cable-entry preparation is complete, reinstall the gland plate in the bottom of the maintenance bypass cabinet.

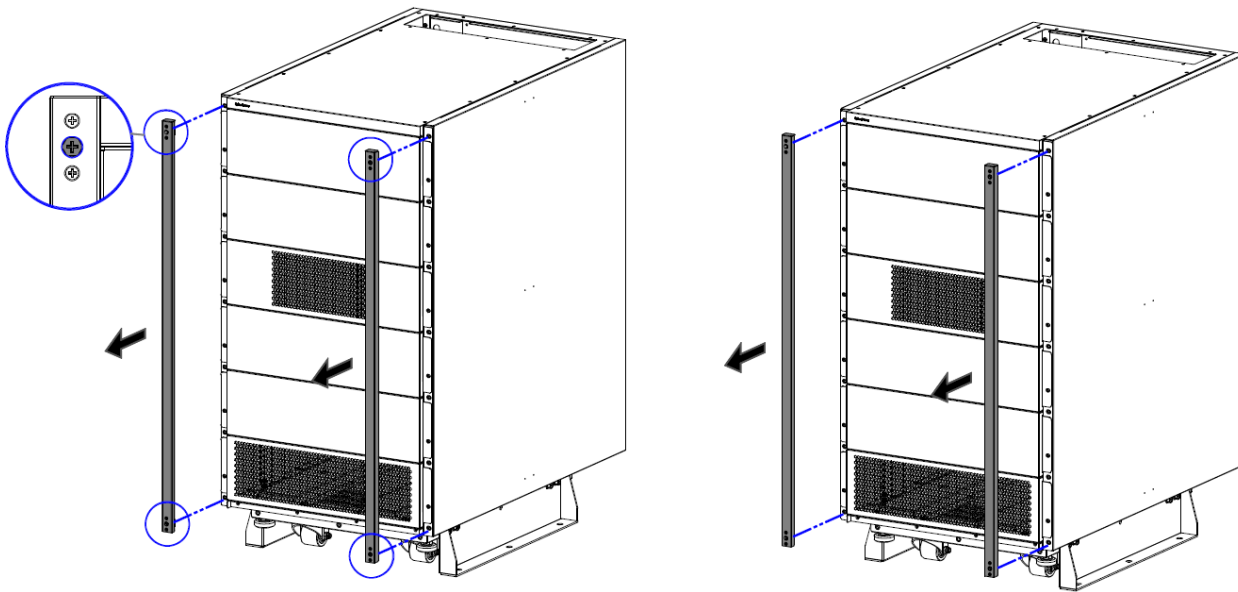
5 - INSTALLATION

5.3 UPS and MBC Integration - Stacked Installation

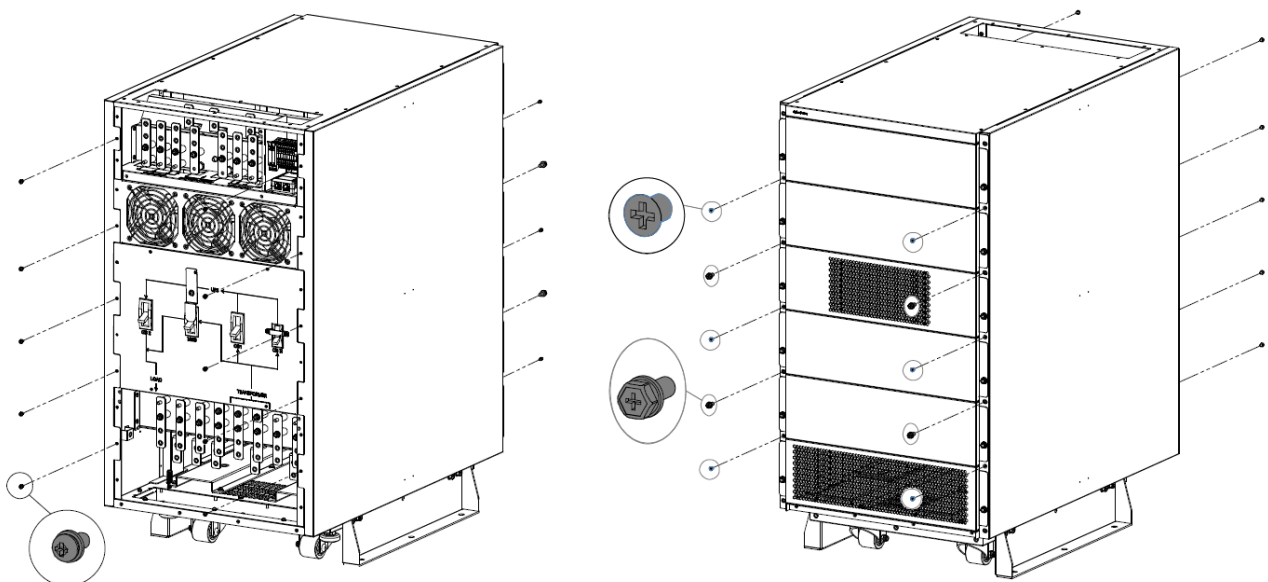
Following the procedure described in Section 4.5.1 “Tower Stacked with Two Cabinets” of the SM-UPS 10–40kW 208V Installation Manual, remove the side panel of the UPS.

Remove the side panel of the Maintenance Bypass Cabinet (MBC) as described below, and complete the stacked installation of the UPS and MBC:

- a. Remove the screws securing the rear decorative trim panel, then remove the rear decorative trim panel from the MBC.

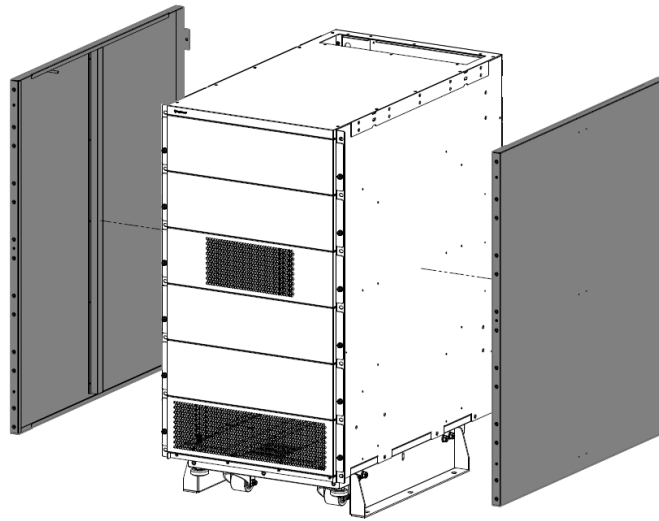


- b. Remove the screws securing the left and right side panels of the MBC.

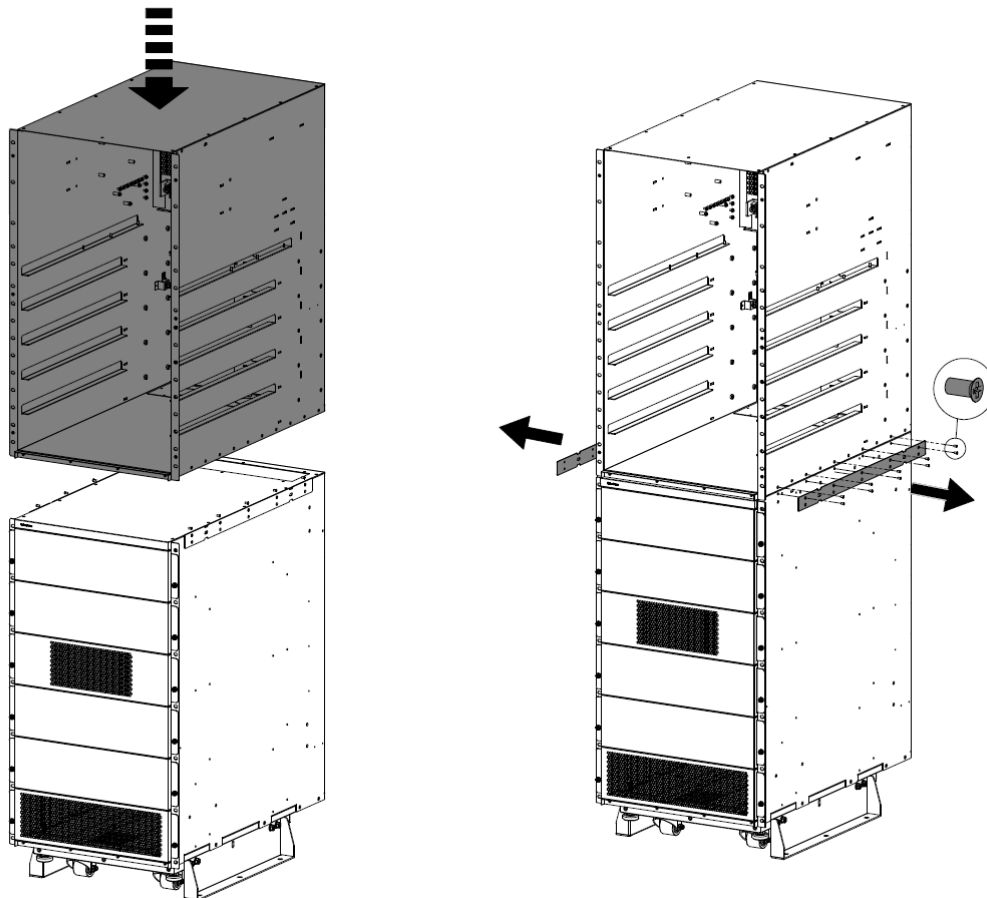


5 - INSTALLATION

- c. Detach and set aside the left and right side panels of the MBC.

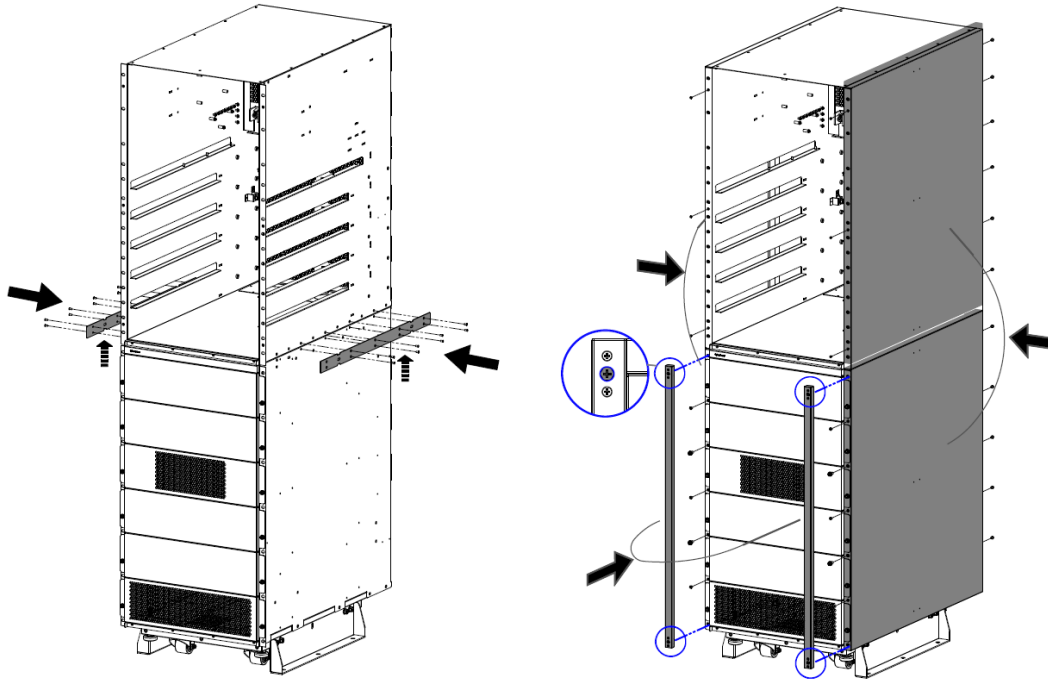


- d. Carefully position the UPS on top of the MBC, ensuring proper alignment for stacking.
- e. Remove the stacking plates (installed as protective covers) from the upper left and right stacking mounting areas on the MBC.

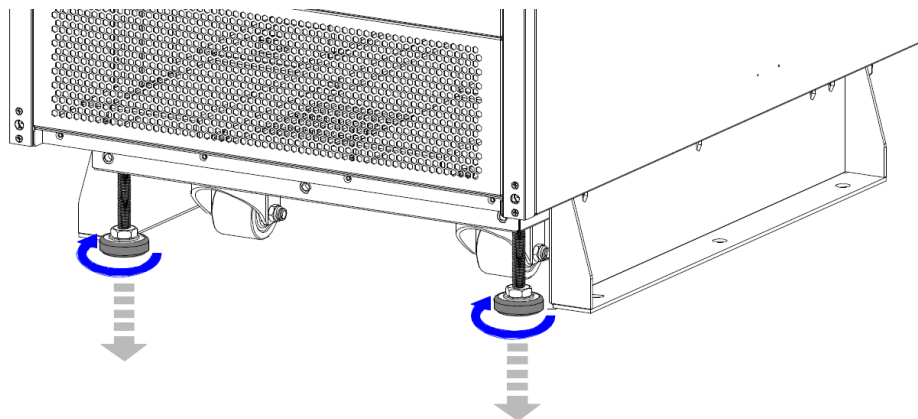


5 - INSTALLATION

- f. Install the stacking plates to securely fasten the UPS to the MBC.
- g. Reinstall the left and right side panels on both the UPS and MBC.
- h. Reattach the rear decorative trim panel on the MBC.



- i. Install the power modules into the UPS and mount the UPS front decorative trim panel.
- j. Using a wrench, lower the front and rear leveling feet of the MBC until they are firmly seated on the floor. Confirm proper horizontal alignment using a bubble level.



CAUTION — Stability Hazard

Do not attempt to move the cabinet after the leveling feet have been lowered. Failure to follow this instruction may result in personal injury or equipment damage.

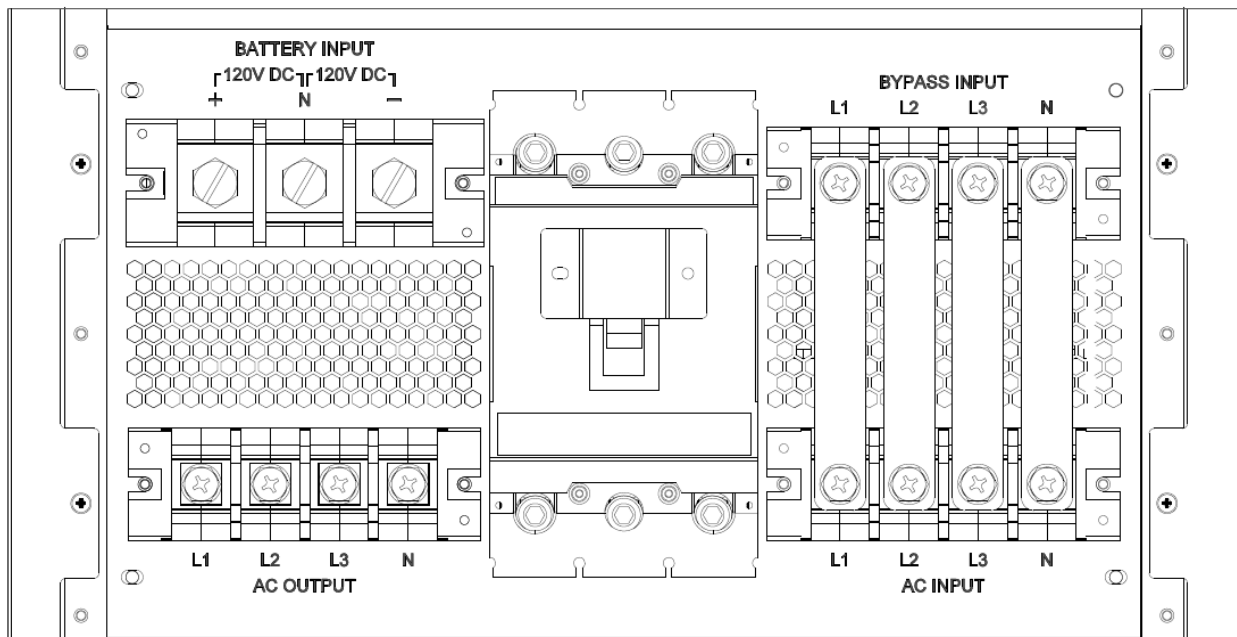
5 - INSTALLATION

5.4 Power Cable Connections Between UPS and MBC

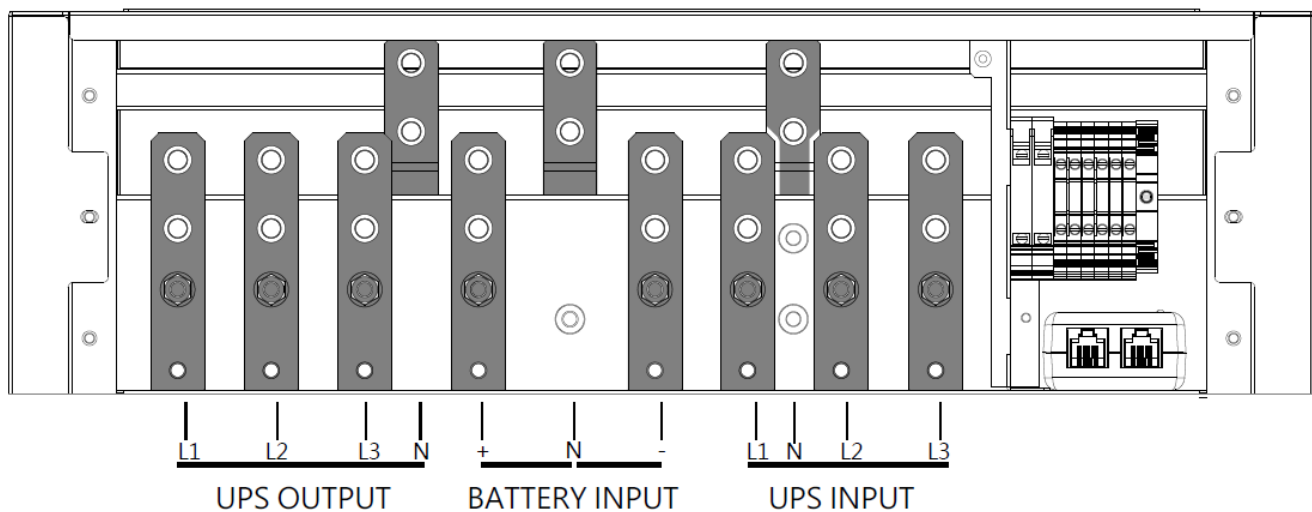
Connect the UPS-MBC interconnection power cables:

- Connect the MBC UPS INPUT busbars to the UPS AC INPUT port/terminals.
- Connect the MBC UPS OUTPUT busbars to the UPS AC OUTPUT port/terminals.
- For bottom-entry systems only: Connect the MBC BATTERY INPUT busbars to the UPS BATTERY INPUT port/terminals, as applicable.

UPS Configuration Area



MBC Configuration Area



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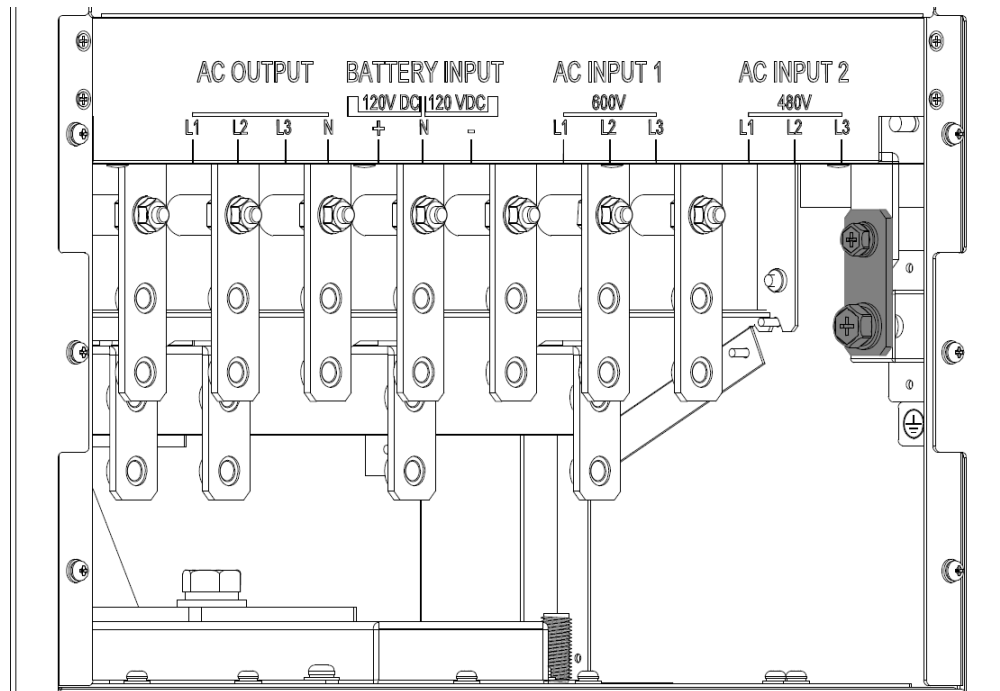
5.5 Input and Output Terminal Connections in the MBC

5.5.1 Grounding and Neutral Isolation Requirements

When the UPS installation includes an isolation transformer and the system is treated as a separately derived system, grounding and bonding shall be implemented in accordance with NEC 250.30(A).

A single neutral-to-ground bonding point shall be provided by installing a System Bonding Jumper (SBJ) at the transformer secondary. This bonding point establishes the ground reference for the separately derived system and provides a low-impedance fault-current path to support proper operation of overcurrent protection devices.

A configuration diagram is shown below. The System Bonding Jumper (SBJ) shall use the copper busbar listed as No. 3 in Table 4-1 Standard Package Contents.



The Grounding Electrode Conductor (GEC) shall be sized and installed in accordance with NEC 250.66 and connected to the site grounding electrode system as required by code.



NOTICE — The System Bonding Jumper (SBJ) is provided as a copper busbar in the accessory pack and shall be used only when required by wiring/grounding requirements and applicable site code.

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5.5.2 Breaker Requirements

CB5 — Internal Maintenance Bypass Breaker

For installations in which the UPS is connected to a Maintenance Bypass Cabinet that includes an isolation transformer, CB5 shall remain in the OPEN position and shall be secured with a padlock.

Closing CB5 in this configuration may:

- create unintended parallel bypass paths
- introduce multiple ground reference points
- cause unsafe backfeed conditions
- violate NEC 250.30 grounding principles
- endanger personnel and equipment

Refer to the applicable system diagram showing CB5 in the OPEN state.

CB N — Neutral Disconnect Breaker

CB N provides a means to fully isolate the neutral conductor when required for:

- maintenance or shutdown activities
- insulation resistance testing
- site-specific neutral-to-ground bonding configurations

This isolation helps prevent unintended neutral continuity with upstream grounding systems.

5.5.3 Upstream Protection — External Circuit Breaker (ECB)

An External Circuit Breaker (ECB) shall be installed upstream of the isolation transformer.

The ECB provides:

- primary-side overcurrent protection
- a service disconnect function
- compliance with NEC Articles 240 and 408 for feeder and transformer wiring protection

For ECB rating requirements, refer to Appendix A (A.2 Recommended Upstream Protection).

5.5.4 IMPORTANT

Failure to implement the grounding, bonding, and isolation scheme described above may result in:

- ground faults
- code violations
- electrical hazards during operation or servicing

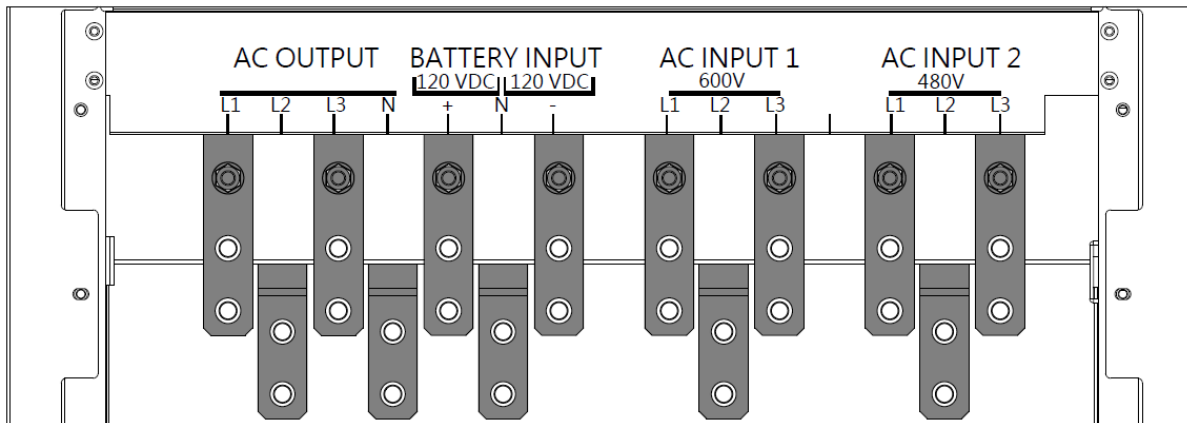
5 - INSTALLATION

5.5.5 Terminal Connections (Power Wiring)



NOTICE — Important:

This equipment supports either 480V or 600V input, only one voltage configuration may be used at a time. Connecting both voltage sources simultaneously may cause equipment damage or pose serious safety risks.



Pre-Installation Notes

- All power cables (input, load, and DC) must be routed through the bottom of the Maintenance Bypass Cabinet (MBC). Top cable entry is not supported.
- To prevent electromagnetic interference (EMC), input, load, and DC cables must be routed separately. Avoid bundling or crossing different cable types.
- All cables should be routed in front of the horizontal bracket at the bottom of the cabinet to ensure proper separation from the internal transformer.
- It is recommended to use cable ties to fasten cables securely and prevent loosening or sagging.
- Power cables can be routed into the MBC from the rear-bottom entry point.
- It is recommended to route the cables through the elliptical cable entry hole to prevent foreign objects or small animals from entering the cabinet. If the elliptical hole is not large enough, use a circular cable entry protector instead.
- For bottom cable entry, first remove the cover plate and install a rubber cable protector at the entry point.



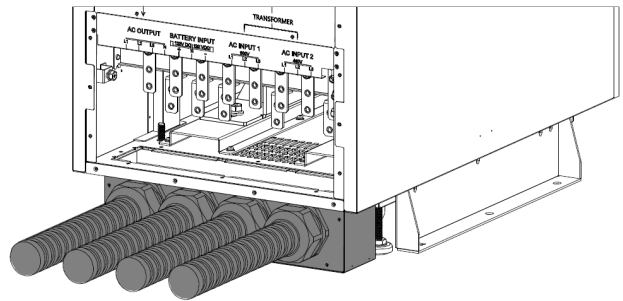
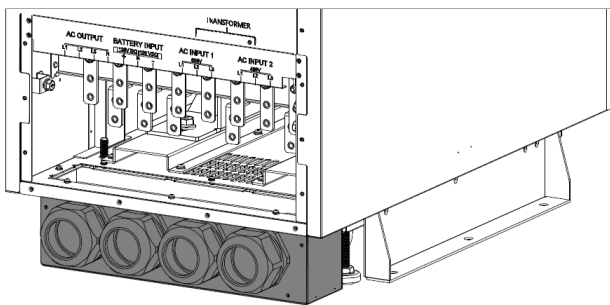
NOTICE — The pre-cut opening for the cable gland on the Ext. Conn. Cover is 64 mm in diameter. It is recommended to use a compatible cable gland model such as PG-48 or CAG-63.

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Rear Cable Entry Routing Instructions

Retrieve the M4 screws (Accessory No. 7), the Ext. Conn. Box (Accessory No. 4) and the Ext. Conn. Cover (Accessory No. 5) kit. Follow the instructions below to complete the assembly and installation process.

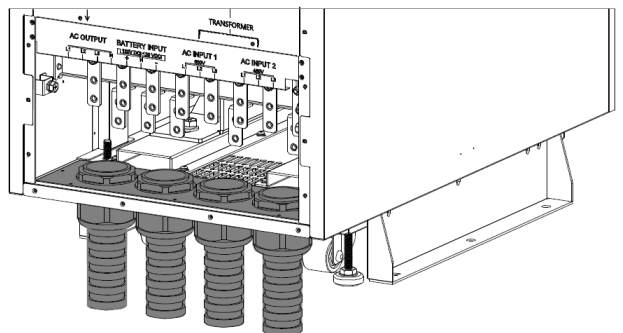
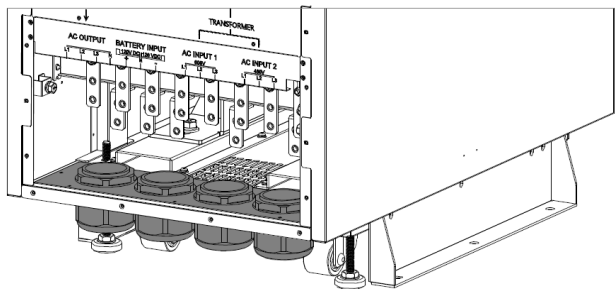
1. Mount the Ext. Conn. Box (No. 4) onto the bottom cable outlet of the MBC.
2. Install the cable gland or conduit on the Ext. Conn. Cover (No. 5) for cable routing.
3. Align the cover with the connection box and fasten them using the M4 screws (No. 3) to complete the rear cable entry setup.



Bottom Cable Entry Installation Instructions

Follow the instructions below to complete the assembly and installation process for bottom cable entry:

1. Retrieve the cable entry interface plate located at the bottom of the MBC.
2. Install the cable gland or conduit onto the removed interface plate based on actual wiring needs. Ensure proper alignment of the hole positions and cable routing direction.
3. Reinstall the interface plate-with the mounted cable gland or conduit-onto the bottom of the MBC using the original screws.
4. Route the cables through the cable gland or conduit, ensuring sufficient length is available for connection to the AC input, AC output, and battery input terminals.



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Installation Steps

1. Input Cable Connection (choose one configuration only):

- For 480V input: Route the input cables through the bottom of the MBC and connect them to the upper 480V input busbars and the PE (Protective Earth) busbar.
- For 600V input: Route the input cables through the bottom of the MBC and connect them to the lower 600V input busbars and the PE busbar.



WARNING — Only one input voltage (480V or 600V) may be used.
Do not connect both.

2. Load Cable Connection:

Route the load cables through the bottom of the MBC and connect them to the following terminals in order:

- L1 / L2 / L3 Load Busbars
- N Neutral Busbar
- PE Protective Earth Busbar

3. DC Cable Connection:

Route the DC cables through the bottom of the UPS cabinet, then refer to the UPS Installation Manual to complete the wiring to the designated DC busbars and grounding point.

4. Cable Securing:

Secure all power cables in front of the horizontal bracket at the bottom of the MBC to maintain clear separation and proper routing.

Use cable ties to fasten cables securely and prevent obstruction or mechanical stress.

Additionally, all cables may be routed through the included accessory wiring box attached to the MBC.

This box supports the use of cable glands and conduit fittings to enhance cable management and ensure safe, organized installation.



NOTICE — Cable glands and conduit fittings are not included and must be purchased separately based on site requirements.

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5.6 Signal Wiring for Functional Integration

To ensure proper function of fan protection, transformer temperature monitoring, backfeed protection, and maintenance bypass detection, the following signal interfaces and wiring must be completed between the MBC and the UPS.

5.6.1 Function Description (Reference)

The dry contacts listed below provide status/event signals used for alarm indication, protective actions (trip), and operational interlocks. The exact system response (alarm notification, breaker trip, logging) depends on the UPS configuration, monitoring configuration, and site integration design.

Transformer Over Temperature Protection (OTP) Sensor

Provides transformer over-temperature status signals for UPS/MBC system integration. When an OTP condition occurs, it indicates that the transformer temperature has reached an abnormal high threshold, and the MBC will trip CB1 to perform protective action.

Transformer Temperature Alarm Output (Optional)

Optional temperature alarm output to the Environmental interface input for monitoring/logging and notification, used together with the remote monitoring and alert configuration.

Backfeed Protection & Transformer OTP Trip Drive Output

Provides protective interlocking and trip drive signals. When the UPS operates in battery mode and detects a failure or short circuit in the bypass SCR, the UPS can trigger the CB1 input circuit breaker or contactor to trip via dry contacts (e.g., J6 1 / J7 1), to prevent energy backfeed to the bypass AC source. The same signal group may also be used, according to system design, to drive the protective breaker trip action under transformer OTP conditions.

Maintenance Bypass Breaker Cover Detection

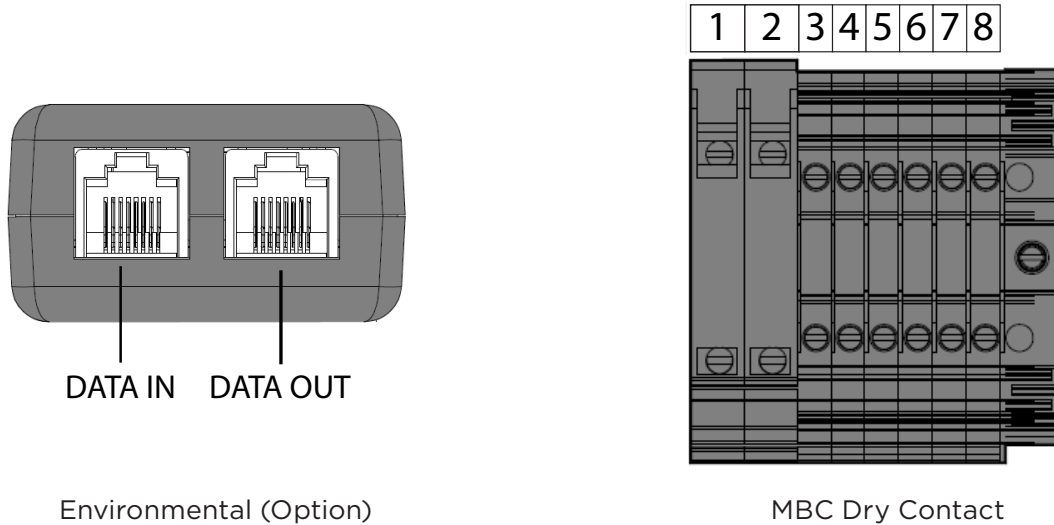
Provides an interlock signal associated with maintenance bypass breaker cover detection. This signal is used by the UPS logic as a condition for maintenance bypass detection/verification and supports the operating requirements in Chapter 7.

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MBC Dry Contact Wiring Assignments

Dry Contact	Connection To	Required Cable / Accessory
MBC_NO.3	UPS Dry Contact J5-1	Use No. 12 in Table 4-1: Standard Package Contents
MBC_NO.4	UPS Dry Contact J6-1	Use No. 12 in Table 4-1: Standard Package Contents
MBC_NO.5	SNEV001 Dry Contact 1	Use No. 10 in Table 4-1: Standard Package Contents
MBC_NO.6	SNEV001 Dry Contact COM	Use No. 11 in Table 4-1: Standard Package Contents
MBC_NO.7	UPS Dry Contact J7-1	Use No. 13 in Table 4-1: Standard Package Contents
MBC_NO.8	UPS Dry Contact J6-2	Use No. 14 in Table 4-1: Standard Package Contents
SNEV001 DATA OUT	RMCARD205	Use the CAT5 RJ45 Ethernet cable (10 ft / 3.05 m) included with SNEV001

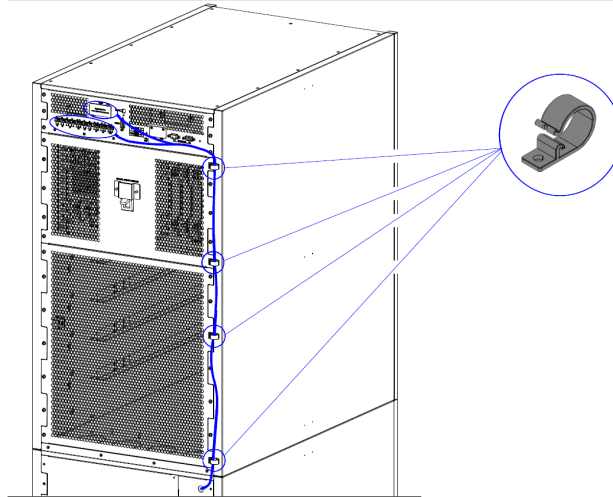
Environmental and MBC Dry Contact Interface



5 - INSTALLATION

Route all signal cables along the rear-right path between the MBC and UPS. Keep them separate from power cables to prevent EMC interference. Ensure all connections are secure and the routing is neat, without damage or obstruction.

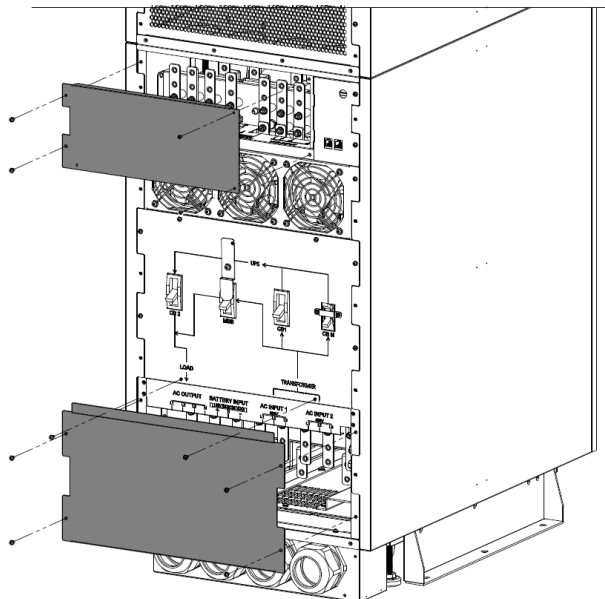
Use the provided Cable Clamps (Use No. 6 in Table 4-1: Standard Package Contents) and secure the signal cables to the UPS and MBC enclosures using the existing side cover screws. Do not route cables freely or through alternative paths, as improper routing may lead to airflow blockage, overheating, or damage to internal components.



5.7 Reattach Panels and Covers

Reinstall all protective covers and panels on the Maintenance Bypass Cabinet (MBC) in the following order to ensure proper enclosure and safety:

1. Reinstall the lower wiring area protective cover.
2. Reinstall the upper wiring area protective cover.



6 - COMMISSIONING AND VERIFICATION

6.1 Reattach Panels and Covers

Before proceeding with system commissioning, verify that all protective covers and panels removed during installation have been reinstalled and properly secured on the Maintenance Bypass Cabinet (MBC) to ensure proper enclosure and safety.

6.2 Pre-Energization Checks

Before energizing the system and starting commissioning, ensure the following requirements have been met:

1. Where seismic compliance is required, verify that seismic anchoring has been completed in accordance with the applicable installation requirements.
2. Verify that all remaining UPS installation steps have been completed in accordance with the official UPS Installation Manual.

6.3 Initial Power On Verification

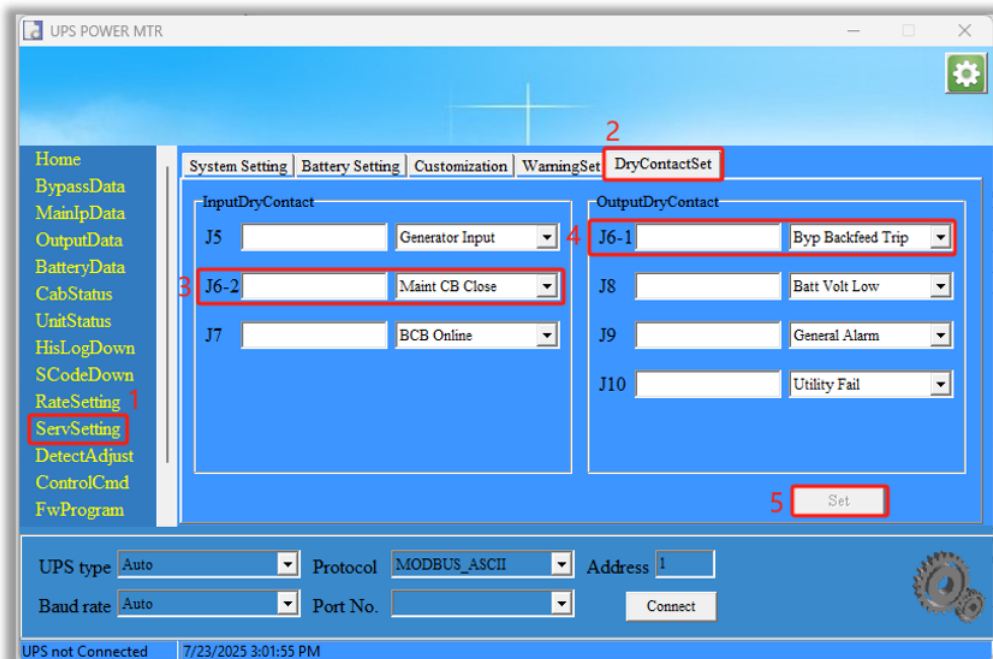
After completing the pre energization checks, perform system energization and initial power on verification in accordance with the applicable UPS Installation Manual.

Verify that the system powers on normally during initial startup. If any issues are encountered during startup or commissioning, please contact CyberPower technical support.

6.4 Remote Monitoring and Alert Setup and Verification

6.4.1 Dry Contact Configuration

Activate Maintenance Bypass Detection and backfeed Protection by following the steps 1-5 shown in the diagram below.

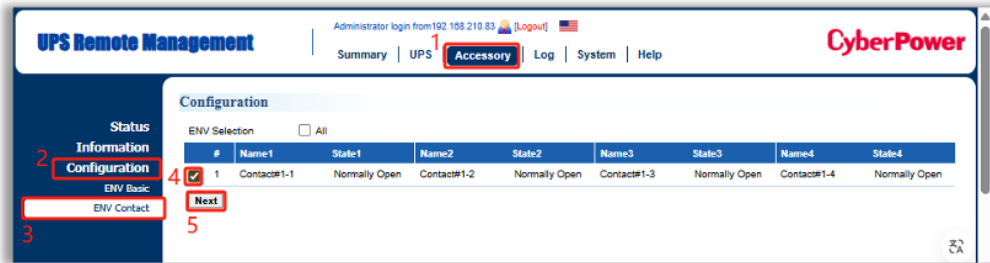


6 - COMMISSIONING AND VERIFICATION

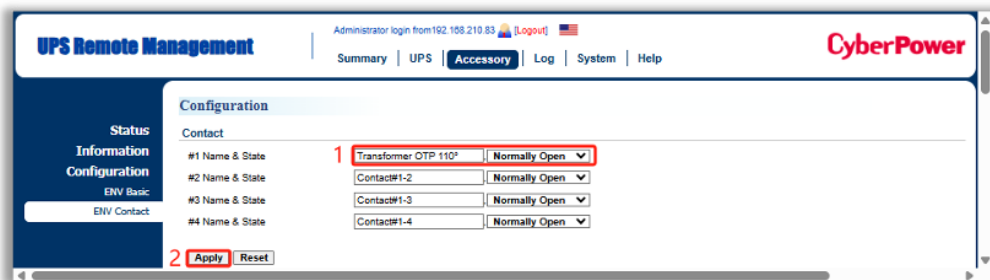
6.4.2 Environmental Configuration (SNMP Card)

The status of the MBC, including transformer-related information, can be monitored via the SNMP card. To receive real-time email notifications, ensure that the following settings are properly configured.

1. Locate the “ENV Contact” under Accessories and log in to the interface. Then follow steps 1–5 as shown below.



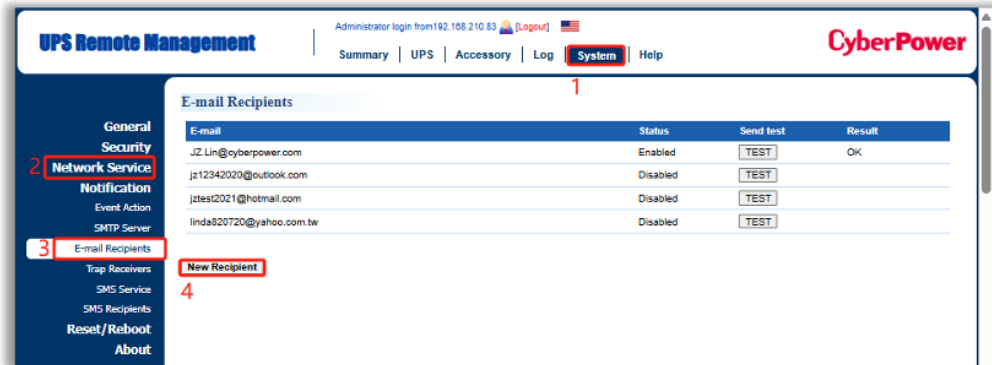
2. In Contact #1 under the “Contact” section, set the Name to “Transformer OTP 110°” and the State to “Normally Open.” After selecting these options, click “Apply” to enable the setting.



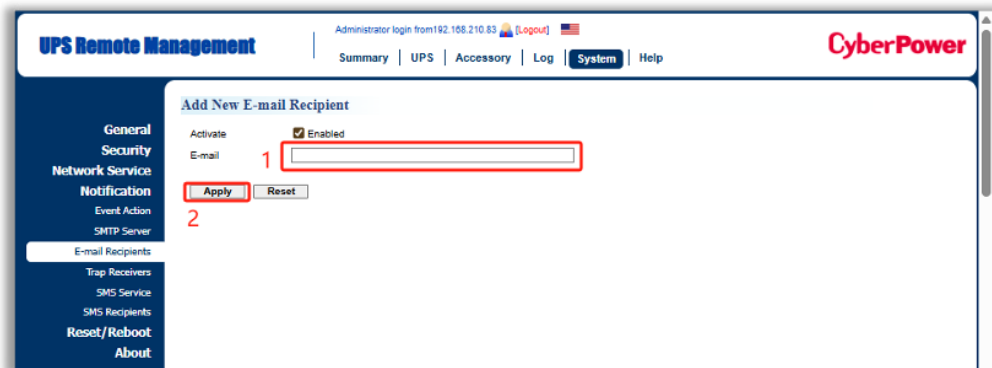
6 - COMMISSIONING AND VERIFICATION

6.4.3 Email Alert Setup and Verification

To enable real time alert notifications, complete the recipient email setup by following the steps below:



1. Enter the recipient's email address and click Apply to enable the setting.
2. Return to the E mail Recipients page and select Send Test to verify that the notification can be received properly.



After completing the steps above, the system will operate normally. If you encounter any issues during the configuration process, please contact CyberPower technical support.

7 - MAINTENANCE BYPASS OPERATION

This chapter defines operation of the MBC45ITCT Maintenance Bypass Cabinet with emphasis on maintenance bypass transfer using MBB and the guard microswitch dry contact interlock. Device and breaker names used in this chapter shall follow Table 2-1.

Legend (applies to this chapter and tables)

CLOSED = ON (Conducting)

OPEN = OFF (Isolated)

7.1 Interlock Function and Required Verification

The MBB guard microswitch shall be wired through the MBC dry contact interface to the UPS dry contact input. Guard removal shall change the microswitch state OPEN → CLOSED, which shall request the UPS to enter Bypass Mode prior to manual bypass switching.

Before MBB is CLOSED, both conditions shall be verified:

1. The UPS indicates Bypass Mode, and
2. Output voltage is present.

7.2 Normal Operating State

The normal operating baseline shall be as follows:

ECB — External Circuit Breaker (Upstream Protection):

CLOSED (ON). ECB shall remain CLOSED (ON) during both Normal and Service states. Upstream protection requirements shall follow Appendix A (A.2 Recommended Upstream Protection)

CB N — Neutral Disconnect Breaker:

CLOSED (ON) during normal operation. The mechanical retainer shall remain in place to reduce inadvertent operation. CB N shall not be operated unless an approved maintenance/testing procedure explicitly requires neutral isolation.

MBB — Maintenance Bypass Breaker:

OPEN (OFF) and the guard installed.

CB5 — UPS Internal Maintenance Bypass Breaker:

OPEN (OFF) + SECURED as required by the transformer/bonding scheme; CB5 shall not be changed unless an approved procedure explicitly permits it.

7 - MAINTENANCE BYPASS OPERATION

7.3 Transfer from UPS Mode to Maintenance Bypass

Enter Service: Maintenance Bypass Established and UPS Powered Down

To enter the Service condition, the following shall be satisfied:

1. The MBB guard shall be removed to trigger the interlock (microswitch OPEN → CLOSED).
2. The UPS shall be verified in Bypass Mode and output voltage present.
3. MBB shall be CLOSED to support the load on the maintenance bypass path.
4. With MBB CLOSED, the UPS may be placed into a fully powered down service condition by setting all switching devices other than MBB to their required OPEN (OFF) positions per the approved maintenance procedure.

ECB shall remain CLOSED (ON) during maintenance bypass operation.

Wiring/terminal details shall follow Section 5.5.5 Terminal Connections (Power Wiring).

7.4 Transfer from Maintenance Bypass to UPS Mode

(Return to Normal Operation: Service Exit)

To return to normal operation, the following conditions shall be achieved:

1. The UPS shall be energized and allowed to return to Normal Mode (typical transition time 1-2 minutes under normal conditions).
2. After the UPS indicates Normal Mode, all required breakers/switching devices shall be returned to their Normal (Run) positions (see Table 7-1).
3. Output voltage shall be verified stable.

The UPS provides procedures for switching between operating modes in its operator documentation.

7 - MAINTENANCE BYPASS OPERATION

7.5 Breaker Position Summary and Checklist

Table 7-1. Breaker Position Summary (Normal vs Service)

Legend: CLOSED = ON (Conducting); OPEN = OFF (Isolated).

Device	Normal (Run)	Service	Notes
ECB	CLOSED (ON)	CLOSED (ON)	ECB shall remain CLOSED in Service.
CB1	CLOSED (ON)	OPEN (OFF)	Open in Service to isolate UPS input path.
CB2	CLOSED (ON)	OPEN (OFF)	Open in Service to isolate UPS output path.
MBB	OPEN (OFF)	CLOSED (ON)	Closed in Service to support load on bypass.
CB N	CLOSED (ON)	CLOSED (ON)	Shall remain CLOSED unless approved procedure requires isolation.
CB5	OPEN (OFF)	OPEN (OFF)	Shall remain OPEN + secured per scheme/procedure.
CB3	CLOSED (ON)	OPEN (OFF)	Open as needed to achieve full UPS power down per procedure.
MBB Guard	Installed	Removed	Removal triggers UPS bypass request via dry contact.

Return to Normal Checklist (Minimum)

Return to Normal shall be considered complete only when all items below are satisfied:

1. UPS indicates Normal Mode.
2. Output voltage is stable.
3. Breaker lineup restored: All required devices are set to Normal (Run) positions per Table 7-1, including CB2, and any site-applicable devices (e.g., CB3).

8 - MAINTENANCE/TROUBLESHOOTING/SUPPORT

This chapter provides recommended maintenance practices, symptom based troubleshooting guidance, and support information for the MBC45ITCT Maintenance Bypass Cabinet. Maintenance shall be performed only by qualified personnel and in accordance with applicable site safety requirements and work procedures.



NOTICE — This chapter is intended as a field maintenance supplement and does not replace approved site procedures or the applicable UPS documentation (including detailed UPS fault diagnostics and repair guidance).

8.1 Maintenance Overview

8.1.1 General Principles (Airflow / Condition / Frequency)

1. Ventilation and cooling: Maintain clear airflow paths and adequate ventilation clearance to prevent overheating and to support long service life.
2. Condition based maintenance: Dust/contamination in accessible areas should be addressed where it may restrict airflow or contribute to abnormal thermal conditions.
3. Inspection frequency adjustment: Inspection frequency should be adapted to site conditions and maintenance practice (e.g., annual in clean/dry areas; increased frequency in dusty/contaminated areas).

8.1.2 Recommended Maintenance Schedule (Simplified)

Monthly (Routine Inspection)

- Airflow verification: Verify ventilation openings and airflow paths are not obstructed.
- Visual condition check: Inspect cabinet exterior and accessible areas for dust accumulation, contamination, damage, or visible discoloration at terminals/wiring areas (possible overheating indication).
- Fan mesh/guard check (no replaceable filter): Verify the fan mesh/guard is not blocked by dust or foreign objects. If buildup is observed, clean it in accordance with site safety procedures.

8 - MAINTENANCE/TROUBLESHOOTING/SUPPORT

Annual (Preventive Maintenance)

Connection integrity / torque confirmation:

Verify all power connections for looseness and inspect for signs of overheating/discoloration. If re-tightening is required, apply torque according to this manual's Torque Specifications (Appendix A / A.5 Torque Specifications section) and connector/lug manufacturer recommendations.

Output distribution (if applicable):

If the system includes output distribution modules/elements, verify they are operating properly.

Abnormal noise/vibration observation:

Observe for abnormal humming or vibration. Inspect accessible external panels, covers, mounting points, and fasteners for looseness or vibration transfer. If abnormal conditions persist, contact technical support.

Functional verification (cross reference):

Interlock / bypass operation:

Follow Chapter 7 requirements for verification and transfer activities.

Remote monitoring & alerts:

Where remote monitoring is enabled, review status/alarm information and perform verification steps described in Section 6.4.

8.1.3 Cleaning Guidance (Condition Based)

Where dust accumulation is observed in accessible areas, cleaning may be performed as part of preventive maintenance and shall follow site safety requirements (including energy isolation and lockout/tagout where required by site practice).

Preferred practice is to use vacuum cleaning; where necessary, clean, dry, low pressure compressed air may be used as an aid. Avoid liquid cleaners/solvents on insulating materials.

This manual does not require internal transformer repair. If internal transformer damage is suspected, contact CyberPower technical support.

8 - MAINTENANCE/TROUBLESHOOTING/SUPPORT

8.1.4 Optional Site Enhancements (Supplied by Others)

If the site requires additional noise/vibration control, the system integrator may consider optional measures (supplied and installed by others), provided they do not obstruct ventilation or required maintenance access.

8.2 Troubleshooting

This section provides symptom based checks referenced to functions and procedures defined in this manual. For internal UPS faults, event logs, and advanced diagnostics, refer to the applicable UPS Service Manual troubleshooting section.

Troubleshooting Guide (Symptom Based)		
Symptom	Possible cause	Recommended Action
UPS does not enter Bypass Mode after MBB guard removal	Interlock signal wiring/dry contact not functioning, or related configuration not active	Verify signal wiring and confirm monitoring/configuration settings per Section 6.4. Verify required conditions and transfer logic per Chapter 7 before proceeding.
Output voltage is not present before MBB operation	UPS not in Bypass Mode or upstream path unavailable/output not established	Do not close MBB. Reverify required conditions and transfer sequence per Chapter 7 before proceeding.
Transformer related alarm / OTP indication reported by monitoring	Airflow obstruction, dust buildup, fan not operating or fan failure causing insufficient cooling, or signal/configuration issue	Verify airflow paths and confirm the fan mesh/guard is unobstructed; verify fan operating status; review monitoring status/alarm information per Section 6.4. If the condition persists, contact technical support.
Fan stops running	Fan mechanically blocked, fan power/wiring issue, or fan protection circuit open (e.g., fan fuse open)	Verify the fan mesh/guard is not blocked by dust or foreign objects (do not force rotation). If the fan remains non operational, do not continue operation under uncertain cooling conditions; collect status/alarm information/photos as available, then contact technical support.

8 - MAINTENANCE/TROUBLESHOOTING/SUPPORT

Symptom	Possible cause	Recommended Action
Backfeed Protection event	When utility is not available and the UPS is operating in battery mode, the UPS detects single phase AC present at the bypass input terminal block. This may indicate a static bypass switch (SCR) failure/short and unintended energy backfeed to the bypass terminal block.	Treat this as an abnormal and potentially unsafe condition. Do not proceed with switching operations under uncertainty. Collect monitoring/alarm records and contact CyberPower technical support.
Transformer over temperature protection (OTP) trips the breaker	Transformer temperature exceeded the protection threshold and the system drives a breaker trip as an over temperature protection action	Verify airflow paths and fan operating status; review monitoring/event information per Section 6.4 (if configured). If protection repeatedly trips or the cause cannot be confirmed, stop operation under uncertain thermal conditions and contact technical support.
Email alert notification not received (remote monitoring)	Recipient/settings incomplete, or site email path restricted	Verify Section 6.4 settings and perform "Send Test." If "Send Test" fails, coordinate with site IT to validate SMTP/network policy and firewall access (site specific).

8.3 Technical Support

Before contacting technical support, prepare the following information where available: product model, serial number, associated UPS model, time of occurrence, detailed description, alarm/event/monitoring information, and relevant photos/screenshots. A standard fault reporting template may be used to collect information consistently.

For regional contact information, refer to the Appendix B — Contacts section of this manual.

APPENDIX A — REFERENCE SPECIFICATIONS

A.1 Electrical Input/Output Specifications (MBC with Input Transformer)



NOTICE — Continuous operation is limited to $\leq 110\%$ load.

UPS Rating	10K	20K	30K	40K
Input connections	3-Wire (L1, L2, L3) + PE			
Input Normal Current (A) @ Input Voltage 480V	12	25	37	49
Input Normal Current (A) @ Input Voltage 600V	10	20	30	38
Input Max. Current (A) @ Input Voltage 480V	14	27	41	54
Input Max. Current (A) @ Input Voltage 600V	11	22	33	42
Output connections	4-Wire (L1, L2, L3, +PE, +N)			
Output Current (A) @ 208V	28	56	83	111
Frequency (Hz)	60			
Circuit breaker interrupting ratings (kA)	18			

APPENDIX A — REFERENCE SPECIFICATIONS

A.2 Recommended Upstream Protection for MBC with Input Transformer (ECB)

For 480V Input

UPS Rating	Line RatedCurrent (A)	Breaking capacity
10kVA	60A @ 100% / 75A @ 80%	65kA @ 480 V AC 50/60 Hz UL 489 25kA @ 600 V AC 50/60 Hz UL 489
20kVA		
30kVA		
40kVA		

For 600V Input

UPS Rating	Line RatedCurrent (A)	Breaking capacity
10kVA	50A @ 100% / 60A @ 80%	65kA @ 480 V AC 50/60 Hz UL 489 25kA @ 600 V AC 50/60 Hz UL 489
20kVA		
30kVA		
40kVA		

APPENDIX A — REFERENCE SPECIFICATIONS

A.3 Recommended Cable Sizes and Connections

Maximum Allowable Cable Size:

4/0 AWG

Equipment Grounding Conductor:

sized per NEC Article 250.122 / Table 250.122

Basis:

NEC Table 310.15(B)(16), 90 °C conductors with 75 °C terminations, 30 °C ambient, copper conductors only. Apply NEC correction factors if ambient exceeds 30 °C.

UPS Rating	10K	20K	30K	40K
Input phases (AWG)	8	8	4	4
Input PE (AWG)	10	10	10	8
Output phases (AWG)	8	4	3	1
Output PE (AWG)	10	8	8	6
Neutral (AWG)	8	2	1/0	3/0
DC+/DC- (AWG)	10	4	2	1/0
DC PE (AWG)	10	8	6	6



NOTICE — DC cable sizes are recommendations only.

Follow the battery solution documentation for final DC cable selection.

APPENDIX A — REFERENCE SPECIFICATIONS

A.4 Recommended Bolt and Lug Sizes (Copper — One Hole Cable Lugs)

Cable Size	Bolt Size (mm)	Cable Lug (One Hole)	Cable Lug (Two Hole)	Crimping Tool	Die Color
10 AWG	M8 x 18	TLK6-8	N/A	T&B TBM8	Red (#8-#10)
8 AWG	M8 x 18	TLK10-8	LCC8-38D-L	T&B TBM8	Red (#8-#10)
6 AWG	M8 x 18	TLK16-8	LCC6-38D-L	T&B TBM8	Blue (#6-#8)
4 AWG	M8 x 18	TLK25-8	LCC4-38D-L	T&B TBM8	Grey (#4-#6)
3 AWG	M8 x 18	TLK25-8	LCC4-38D-L	T&B TBM8	Grey (#4-#6)
2 AWG	M8 x 18	TLK35-8	LCC2-38D-Q	T&B TBM8	Brown (#2)
1 AWG	M8 x 18	TLK35-8	LCC1-38D-E	T&B TBM8	Green (#1)
1/0 AWG	M8 x 18	TLK50-8	LCC1/0-56D-X	T&B TBM8	Pink (#1/0)
3/0 AWG	M8 x 18	TLAF95-8	LCC3/0-38D-X	T&B TBM8	Orange (#3/0)

APPENDIX A — REFERENCE SPECIFICATIONS

A.5 Torque Specifications

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

A.6 Weights and Dimensions

Model	Weight	Width	Height	Depth
MBC45ITCT	236.18 kg	485 mm	943 mm	775 mm
	520.69 lbs.	19.10 in	37.13 in	30.51 in

A.7 Environmental Conditions and Clearance

Environmental Conditions

- Operating Temperature: 0 °C to 40 °C
- Storage Temperature: -15 °C to 55 °C
- Relative Humidity: 0-95% non-condensing
- Altitude: 0-3000 meters; above 1000 m derating applies
- Protection class: IP20

Clearance

Space requirements are specified for ventilation and maintenance access only. Refer to local requirements. See Fig. 3-1 for clearance reference.

APPENDIX A — REFERENCE SPECIFICATIONS

A.8 Maintenance Bypass and Transformer Specifications

Transformer Type	Dry-Type
Transformer Rating	50kVA
Input	
Voltage	480V or 600V
Nominal Current(A)	480V: 58.3 / 600V: 46.2
Input Isolation	Yes
Output	
Rating	45kW
Transformer Output Voltage	208/120V, (3-Phase, 4-Wire)
Current(A)	125
Connections	4-Wire (L1, L2, L3, +PE, +N)
Battery	
Voltage (Vdc)	+/-120
Current(A)	215A
Circuit Breaker	
Model	LS UTS250N-175A 3pole
Switch	Input Natural (UTE100N-MCS-100 3P)
Operation	
Cooling	Fan * 3
Full Load Efficiency	> 97%
Mechanical	
Transformer Windings	Copper
Cabinet Material	Cold Rolled Galvanized Steel (SGCC)
Physical Information	
Base Support Type	Wheels and Foot
Certificate	
Approvals	cTUVs / UL 1778

APPENDIX B — CONTACTS

If there have any technical problems with the product, please contact the installer or CyberPower. During inquiring, please provide the below information:

1. Model Name
2. Serial Number
3. Detailed Issue Description
4. Fault Registration Report

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All Other Regions

Please visit our website for local contact information