CyberPower®

SMART APP ONLINE
MODULAR 3-PHASE UPS SYSTEM

INSTALLATION MANUAL

SM020KAMFA
SM040KAMFA

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

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF FIGURES

TABLE OF FIGURES

TABLE OF FIGURES

TABLE OF TABLES

SAFETY PRECAUTIONS

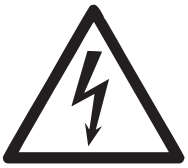
This manual contains information concerning the installation and operation of 3-phase UPS. Please read this manual carefully prior to installation.

For safety reasons, this 3-phase UPS must be installed by a certified technician approved by CyberPower or an authorized representative of CyberPower.

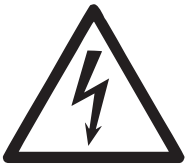
This is a Class C UPS system, and is designed exclusively for commercial or industrial use. It is not approved for use in a life-support capacity nor in a residential environment.

Symbols Used

The following types of safety instructions and general information appear in this document as described below:

Symbol	Description
	**WARNING** potentially hazardous situation — please use caution to prevent serious injury.
	**NOTICE** please utilize caution to avoid damage to UPS or power interruption.
	**INFORMATION** critical to ensuring optimal UPS system operation.

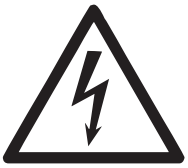
SAFETY PRECAUTIONS



BACK-FEEDING PROTECTION

This system has a control signal available for use with an externally located automatic device to protect against back-feeding voltage through the mains Static Bypass circuit. If this protection is not used with the switchgear that is used to isolate the bypass circuit, a label must be added to the switchgear to advise service personnel that the circuit is connected to a UPS system.

The text has the following meaning or is equivalent to: **Isolate the UPS before working on the circuit of this UPS.**



HIGH EARTH LEAKAGE CURRENT

Earth connection is critical before connecting the input supply (include both utility supply and battery).

“Earth leakage current introduced by the UPS, in any configuration from 10kW to 150kW, exceeds 3.5 mA and is less than 1000 mA and complies with the requirements of IEC/EN 62040-1 / UL 60950-1” Transient and steady-state earth leakage currents, which may occur when starting the equipment, should be taken into account when selecting instantaneous RCCB or RCD devices.

Residual Current Circuit Breakers (RCCBs) selected must be sensitive to DC unidirectional pulses (class A) and insensitive to transient current pulses.

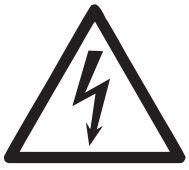
Note also that the earth leakage currents of the load will be carried by this RCCB or RCD.

This equipment must be earthed in accordance with local electrical authority codes of practice.

CONFORMITY AND STANDARDS

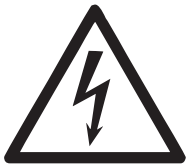
This product complies with the following UPS product standards:

- UL1778, safety requirements for UPS
- FCC part15, EMI requirements class A



WARNING This product can expose you to chemicals including Styrene, which are known to the State of California to cause cancer, and Bisphenol A (BPA), which are known to the State of California to cause birth defects or other reproductive harm. For more information go to http://www.P65Warnings.ca.gov. **(PLEASE NOTE: this changes from product to product based on the chemicals it contains)**

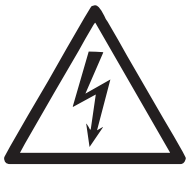
SAFETY PRECAUTIONS



SELF-SERVICE COMPONENTS

All the equipment maintenance and servicing procedures involving internal access need special tools and should be carried out only by trained personnel. The components that can only be accessed by opening the protective cover with tools cannot be maintained by user.

This UPS complies with “IEC62040-1-1-General and safety requirements for use in operator access area UPS”. Dangerous voltages are present within the battery box. However, the risk of contact with these high voltages is minimized for non-service personnel. Since the component with dangerous voltage can only be touched by opening the protective cover with a tool, the possibility of touching high voltage component is minimized. No risk exists to any personnel when operating the equipment in the normal manner, following the recommended operating procedures in this manual.



BATTERY VOLTAGE HIGHER THAN 200Vdc

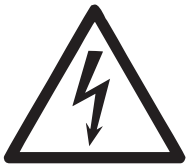
All the battery maintenance and servicing procedures involving internal access need special tools or keys and should be carried out only by trained personnel.

SPECIAL CARE SHOULD BE TAKEN WHEN WORKING WITH THE BATTERIES ASSOCIATED WITH THIS EQUIPMENT.

WHEN CONNECTED TOGETHER, THE BATTERY TERMINAL VOLTAGE WILL EXCEED 200Vdc AND IS POTENTIALLY LETHAL.

Battery manufacturers supply details of the necessary precautions to be observed when working on, or in the vicinity of, a large bank of battery cells. These precautions should be followed implicitly at all times. Particular attention should be paid to the recommendations concerning local environmental conditions and the provision of protective clothing, first aid and fire-fighting facilities.

SAFETY PRECAUTIONS



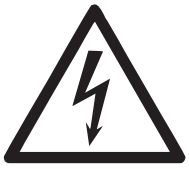
INSTALLATION CAN ONLY BE DONE BY AUTHORIZED ENGINEERS

Do not apply electrical power to the UPS equipment before the commissioning engineer arrives at installation site.

The UPS should be installed by a qualified engineer in accordance with the information contained in this chapter. All the equipment not referred to in this manual is shipped with details of its own mechanical and electrical installation information.

3-PHASE 4-WIRE INPUT POWER IS REQUIRED

The standard UPS system can be connected to TN, TT AC distribution system (IEC60364-3) of 3-phase 4-wire, and a 3-wire to 4-wire conversion transformer is provided as an optional part. Single-phase 3-wire is also provided as an optional part.



BATTERY HAZARDS

Special care should be taken when working with the batteries associated with this equipment.

When connecting the battery, the battery connection voltage will exceed 200Vdc and is potentially lethal.

- Eye protection should be worn to prevent injury from accidental electrical arcs.
- Remove rings, watches and all metal objects.
- Only use tools with insulated handles.
- Wear rubber gloves.
- If a battery leaks electrolyte, or is otherwise physically damaged, it must be replaced, stored in a container resistant to sulfuric acid and disposed of in accordance with local regulations.
- If electrolyte comes into contact with the skin, the affected area should be washed immediately with water.

CHAPTER 1 - INTRODUCTION

1.1 Installation Configurations

Our CyberPower Smart App Online Three-Phase UPS systems are comprised of one or more UPS cabinets and battery cabinets depending on the required configuration.

The 3-phase UPS cabinet and standard external battery cabinets are designed to be installed in side-by-side, tower-stacked or rack-mounted configurations. In side-by-side configuration, the power wiring may be routed external to the cabinet using conduit to pass wiring between adjacent cabinets. Connections are made to easily access connections at the back of the cabinet.
The standard external battery cabinet can connect up to two units.

See Fig 1-3 and Fig 1-4 for side-by-side configuration views.

See Fig 1-5 and Fig 1-6 for tower stacked views. (For SM-20kVA UPS integrated with BCT3L9N125, the height is 502mm/19.8in. For SM-40kVA UPS integrated with BCT6L9N225, the height is 839mm/33in.)

See Fig 1-7 and Fig 1-8 for rack-mounted configuration views. (For SM-20kVA UPS install with BCT3L9N125, the rack space is 22U. For SM-40kVA UPS install with BCT6L9N225, the rack space is 38U.)

Fig 1-1: SM-20kVA and SM-40kVA UPS Cabinets

CHAPTER 1 - INTRODUCTION

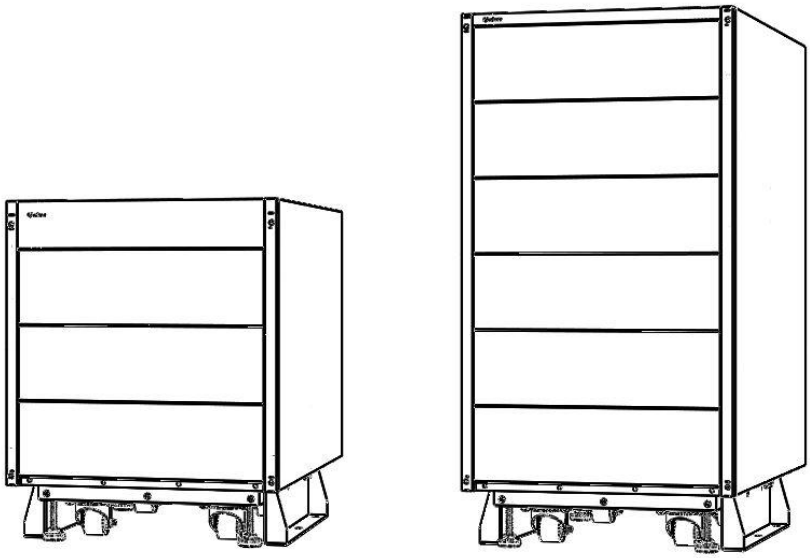


Fig 1-2: BCT3L9N125 and BCT6L9N225 External Battery Cabinets

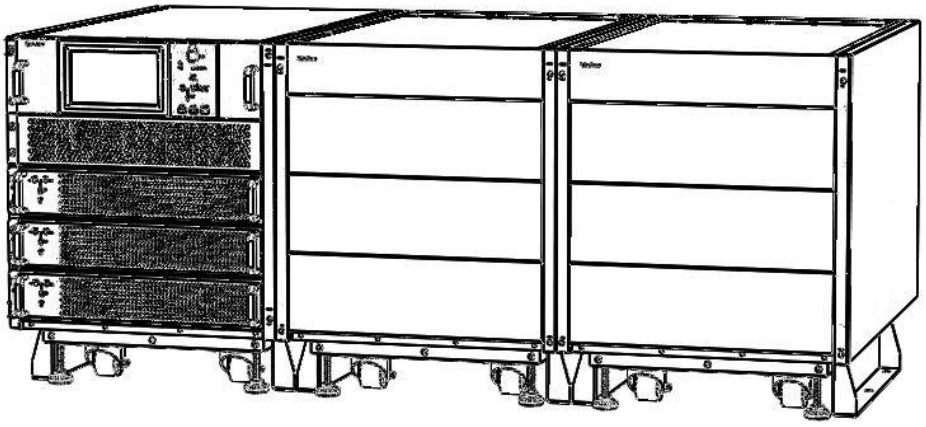


Fig 1-3: SM-20kVA UPS (1 unit) and BCT3L9N125 (2 units)

CHAPTER 1 - INTRODUCTION

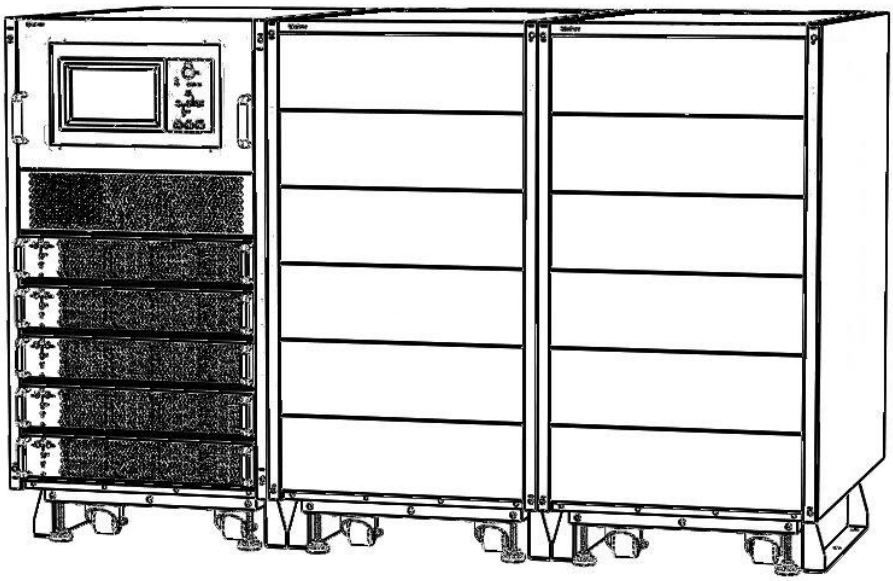


Fig 1-4: SM-40kVA UPS (1 unit) and BCT6L9N225 (2 units)

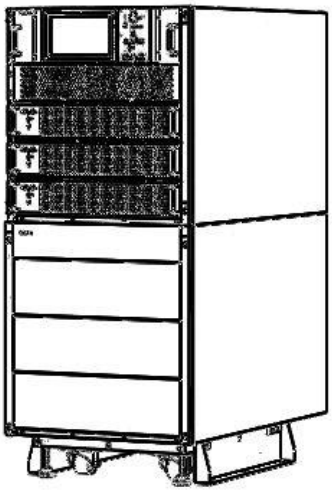


Fig 1-5: SM-20kVA UPS Tower-stacked with BCT3L9N125

CHAPTER 1 - INTRODUCTION

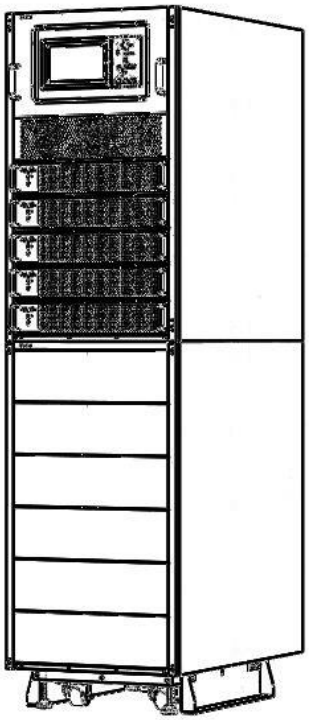


Fig 1-6: SM-40kVA UPS Tower-stacked with BCT6L9N225

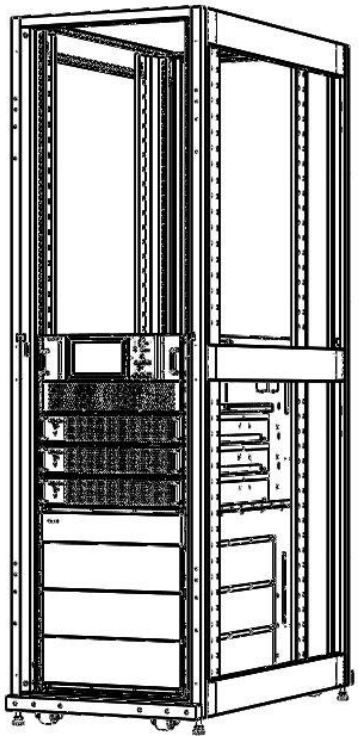


Fig 1-7: Rack-mount Installed with SM-20kVA UPS and BCT3L9N125

CHAPTER 1 - INTRODUCTION

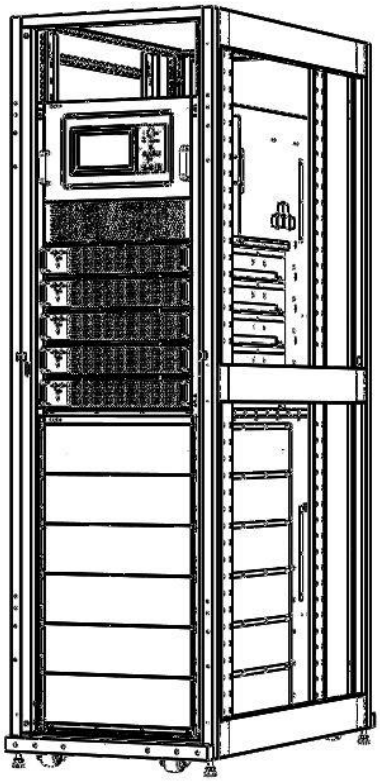


Fig 1-8: Rack-mount Installed with SM-40kVA UPS and BCT6L9N225

CHAPTER 1 - INTRODUCTION

1.2 System Options and Accessories

1.2.1 System Options

Table 1-1: System Options	
Model Name	**Description**
SM020KAMFA	UPS CABINET : 20KVA 20kW 208V 3-PHASE
SM040KAMFA	UPS CABINET : 40KVA 40kW 208V 3-PHASE
SM10KAPMA	UPS POWER MODULE : 10KVA 10kW 208V 3-PHASE
BCT3L9N125	BATTERY CABINET for SM020KAMFA : 3 layers (6 slots) for BM120V30ATY
BCT6L9N225	BATTERY CABINET for SM040KAMFA : 6 layers (12 slots) for BM120V30ATY
BM120V30ATY	BATTERY MODULE W/ 8AH 12VDC BATTERIES 10 PIECES (120VDC)
SMUCB100UAC	100A CIRCUIT BREAKER for SM020KAMFA input/output switching device
SMUCB175UAC	175A CIRCUIT BREAKER for SM040KAMFA input/output switching device
PARLCARD304A	PARALLEL CONTROL CABLE for 3-PHASE UPS SYSTEMS

NOTICE
SMUCB100UAC and SMUCB175UAC are installed in the back side of the external battery cabinet. SMUCB100UAC for BCT3L9N125. SMUCB175UAC for BCT6L9N225.

SMUCB100AC must order two pieces, one for SM-20kVA UPS input circuit breaker, another one for SM-20kVA UPS output circuit breaker.

SMUCB175AC must order two pieces, one for SM-40kVA UPS input circuit breaker, another one for SM-40kVA UPS output circuit breaker.

CHAPTER 1 - INTRODUCTION

1.2.2 Accessories

Table 1-2: UPS Cabinet Accessories			
No.	**Name**	**20K**	**40K**
1	Installation Manual	1	1
2	Product Registration Card	1	1
3	RMCARD205 RJ45/DB9 Serial Port Connection Cable	1	1
4	RMCARD205 Quick Start Guide	1	1
5	RMCARD205 Spare Jumper	1	1
6	RMCARD205 Test Report	1	1
7	Temperature Cable	1	1
8	M4 Screw (accessory part)	5	5
9	M6 Screw (accessory part)	12	20
10	Ext. Conn. Box (accessory part)	1	1
11	Ext. Conn. Cover (accessory part)	1	1
12	Rack Bracket (accessory part)	Small x 2	Large x 2
13	3P Dry Contact (accessory part)	4	4
14	2P Dry Contact (accessory part)	6	6
15	Cable Ring Terminal	Detail List Refer to Appendix B	
16	Heat Shrink Tube	Detail List Refer to Appendix B	

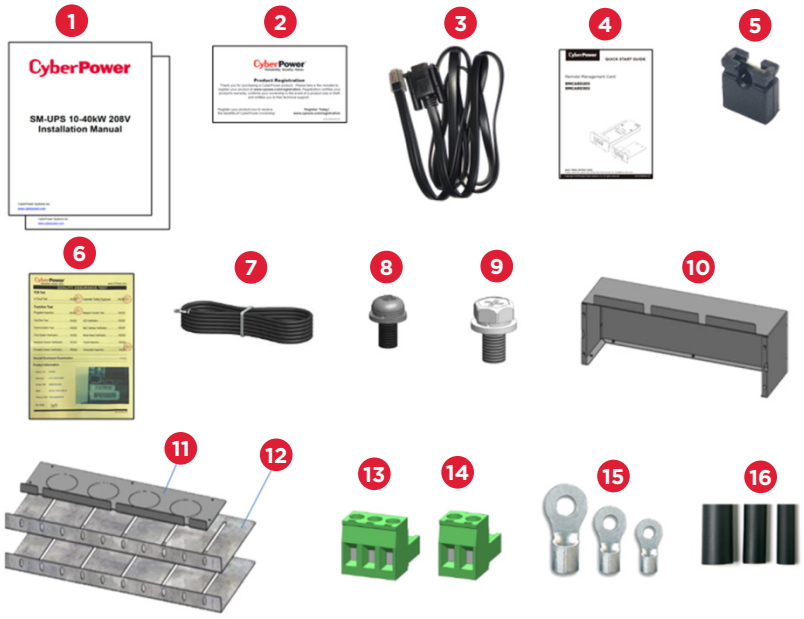
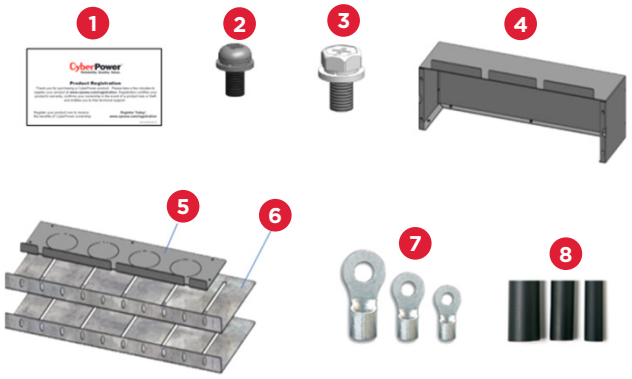


Table 1-3: External Battery Cabinet Accessories			
No.	**Name**	**BCT3L9N125**	**BCT6L9N225**
1	Product Registration Card	1	1
2	M4 Screw (accessory part)	5	5
3	M6 Screw (accessory part)	12	20
4	Ext. Conn. Box (accessory part)	1	1
5	Ext. Conn. Cover (accessory part)	1	1
6	Rack Bracket (accessory part)	Small x 2	Large x 2
7	Cable Ring Terminal	Detail List Refer to Appendix B	
8	Heat Shrink Tube	Detail List Refer to Appendix B	



CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

Perform the following operations prior to installation:

1. Visually inspect the UPS system cabinet and external battery cabinet for any damage that might have occurred in shipping. Report any damage to the shipper immediately.
2. Verify the model number and confirm that all component products are present. The UPS model, capacity and main parameters are marked on the label.

2.1 Installation Plan

Please read this installation and operations manual carefully prior to installing your UPS cabinet and external battery cabinet. This section includes:

- Features, specifications, and dimensions
- Wiring installation instructions
- Location of conduit and wire connection plates
- Location of power connections

2.2 Environmental and Installation Consideration

For a UPS system, the operating environment must meet the weight, clearance, and environmental requirements specified for the applicable accessory cabinet.

To ensure the maximum service life of your UPS system, choose a location that meets the following criteria:

- Space for easy operation of the UPS system
- Air sufficient enough to dispel heat produced by UPS system
- Away from atmospheric agents
- Away from excessive humidity and heat sources
- Away from dust
- With the current fire prevention requirements
- The operating environment temperature is within +15°C to +25°C. The batteries operate at maximum efficiency in this temperature range.
- This equipment is constructed of steel frame structure wrapped by removable panels. The top and side panels are fixed by screws.

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

The UPS system installation, including the battery cabinet, must be installed:

1. On a level floor suitable for computer or electronic equipment.
2. In a temperature and humidity-controlled indoor area free of conductive contaminants.

Failure to follow guidelines may void your warranty.

Table 2-1: UPS Cabinet Weight

Model	UPS Rating	Power Modules	Weight kg(lbs)	
			Shipping (w/o PMs)	Installed
SM020KAMFA	10kVA	1	105.9(233)	77.1(170)
	20kVA	2	105.9(233)	93.5(206)
	20kVA(N+1)	3	105.9(233)	109.9(242)
SM040KAMFA	10kVA	1	136.5(301)	97(214)
	20kVA	2	136.5(301)	113.4(250)
	30kVA	3	136.5(301)	129.8(286)
	40kVA	4	136.5(301)	146.2(322)
	40kVA(N+1)	5	136.5(301)	162.6(358)

Table 2-2: External Battery Cabinet Weight

Model	Strings	Battery Modules	Weight kg(lbs)	
			Shipping	Installed
BCT3L9N125	2	4	106.5(235)	195.5 (431)
	3	6	106.5(235)	262.7 (579)
BCT6L9N225	4	8	150.3(331)	362.7 (800)
	6	12	150.3(331)	497.1 (1096)

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

- The UPS cabinet uses forced cooling to regulate internal component temperature.
- The external battery cabinet uses convection cooling to regulate internal component temperature.
- Air inlets are in the front of the cabinet and outlets are in the back of the cabinet.
- Allow clearance in front of and in back of the cabinet for proper air circulation.

Table 2-3: UPS Cabinet Clearances	
Top of Cabinet	300mm [11.81 inch] working space
Front of Cabinet	1000mm [39.37 inch] working space
Back of Cabinet	500mm [19.69 inch] working space
Right Side of Cabinet	None required
Left Side of Cabinet	None required

Table 2-4: External Battery Cabinet Clearances	
Top of Cabinet	300mm [11.81 inch] working space
Front of Cabinet	1000mm [39.37 inch] working space
Back of Cabinet	500mm [19.69 inch] working space
Right Side of Cabinet	None required
Left Side of Cabinet	None required

The basic environmental requirements for operation of the UPS cabinet are:

- Ambient Temperature Range: 5-40°C (41-104°F)
- Recommended Operating Range: 5-40°C (41-104°F)
- Maximum Relative Humidity: 5-95%, noncondensing

The basic environmental requirements for operation of the external battery cabinet are:

- Ambient Temperature Range: 5-40°C (41-104°F)
- Recommended Operating Range: 15~25°C (59-177°F)
- Maximum Relative Humidity: 5-95%, noncondensing

WARNING Operating temperatures above the recommended range will result in decreased battery life and performance, and will reduce or void the battery warranty.

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

The floor mounting bracket can be mounted on the two sides of cabinet or mounted the front and back sides of cabinet.

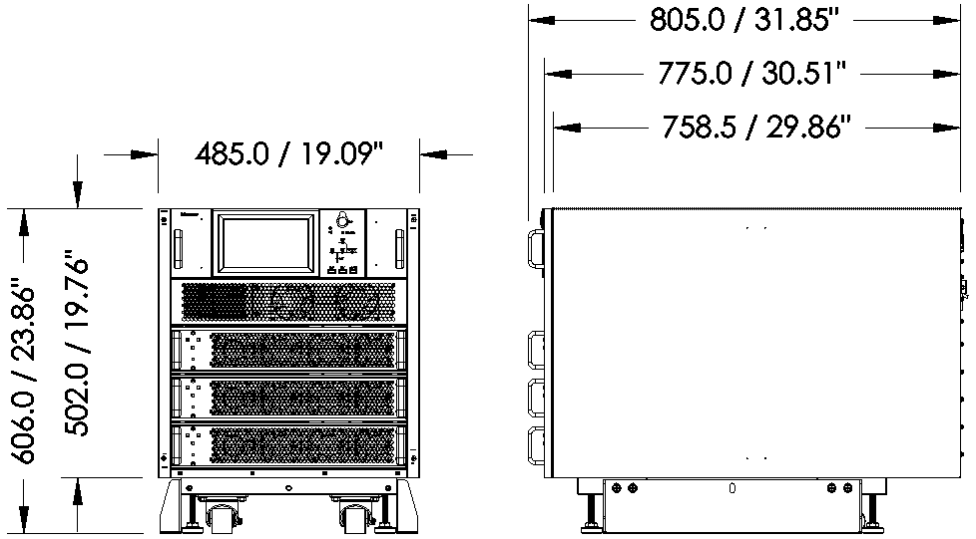


Fig 2-1: SM-20kVA UPS Dimensions

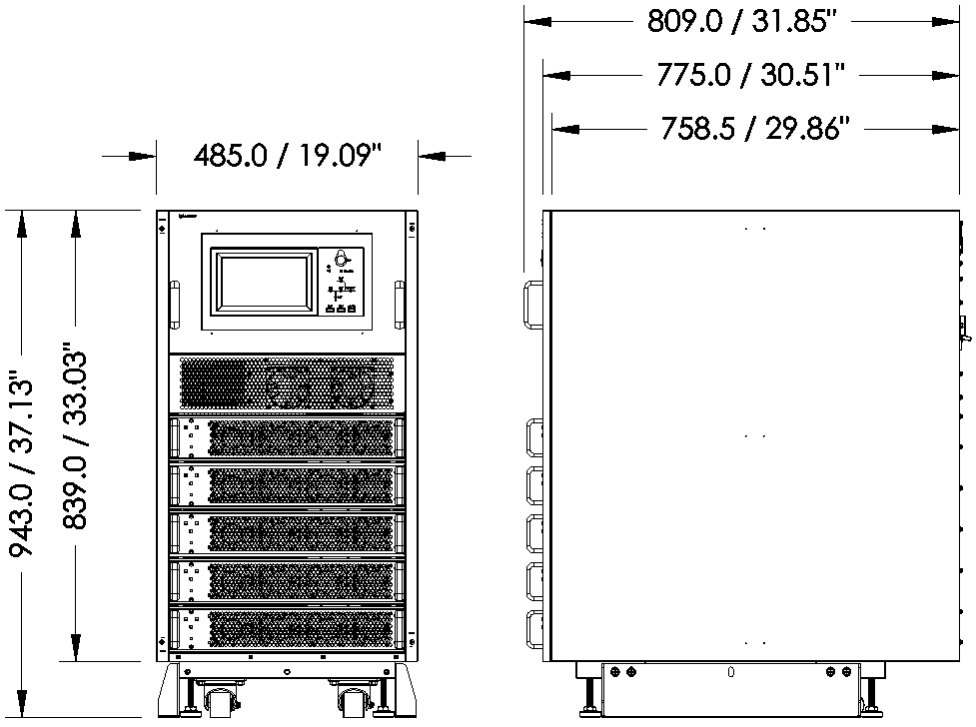


Fig 2-2: SM-40kVA UPS Dimensions

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

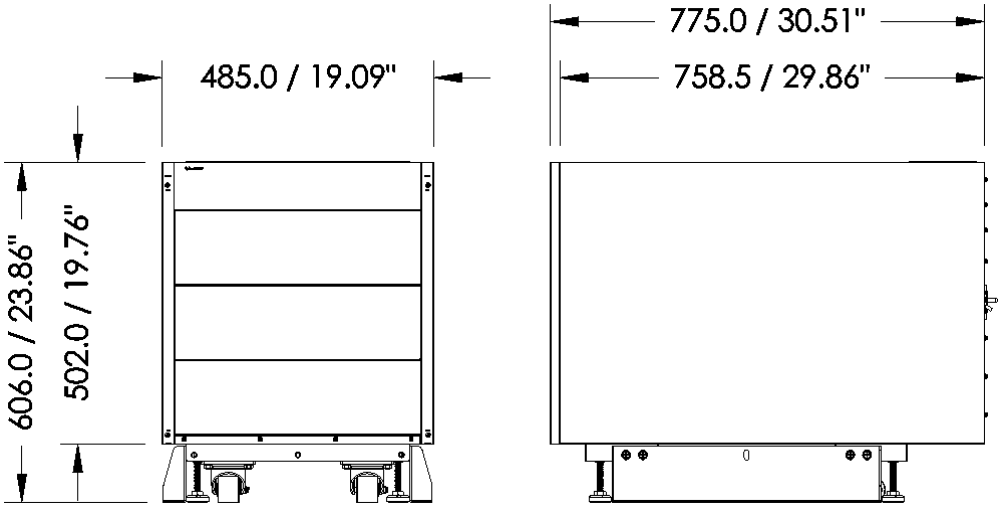


Fig 2-3: BCT3L9N125 Cabinet Dimensions

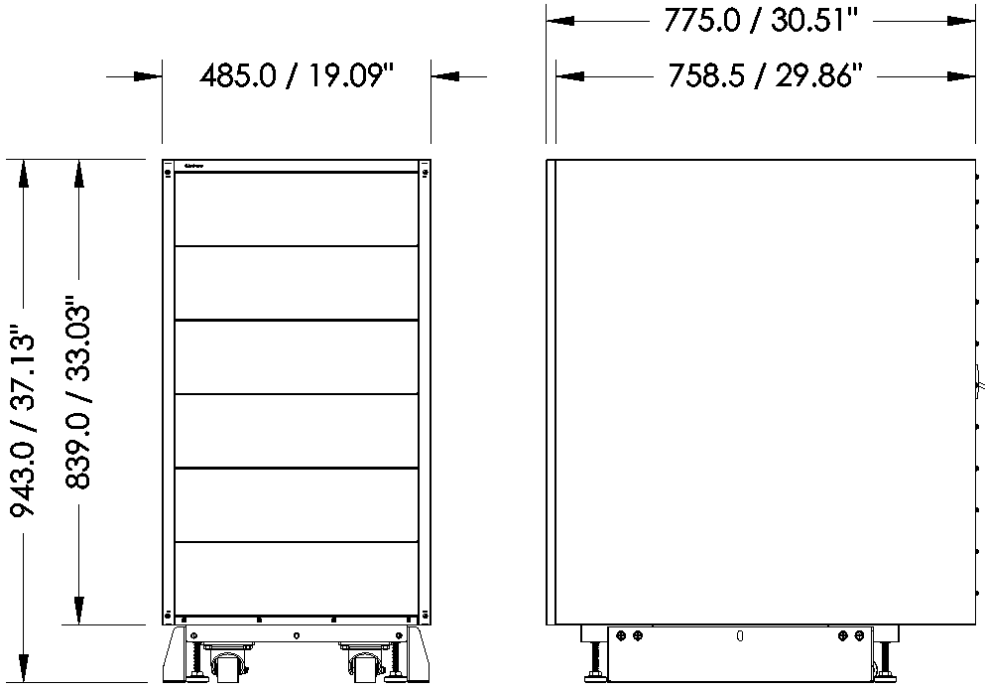
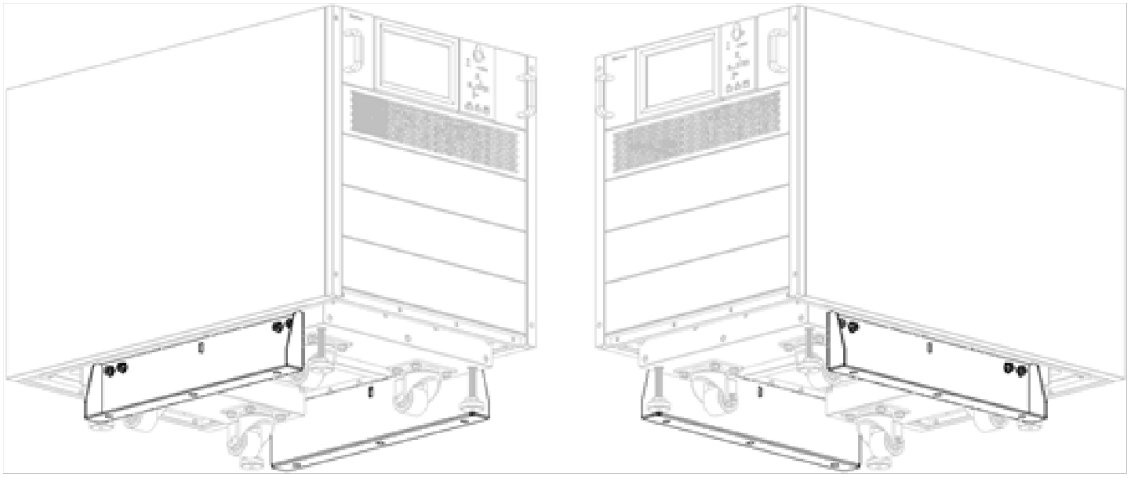


Fig 2-4: BCT6L9N225 Cabinet Dimensions

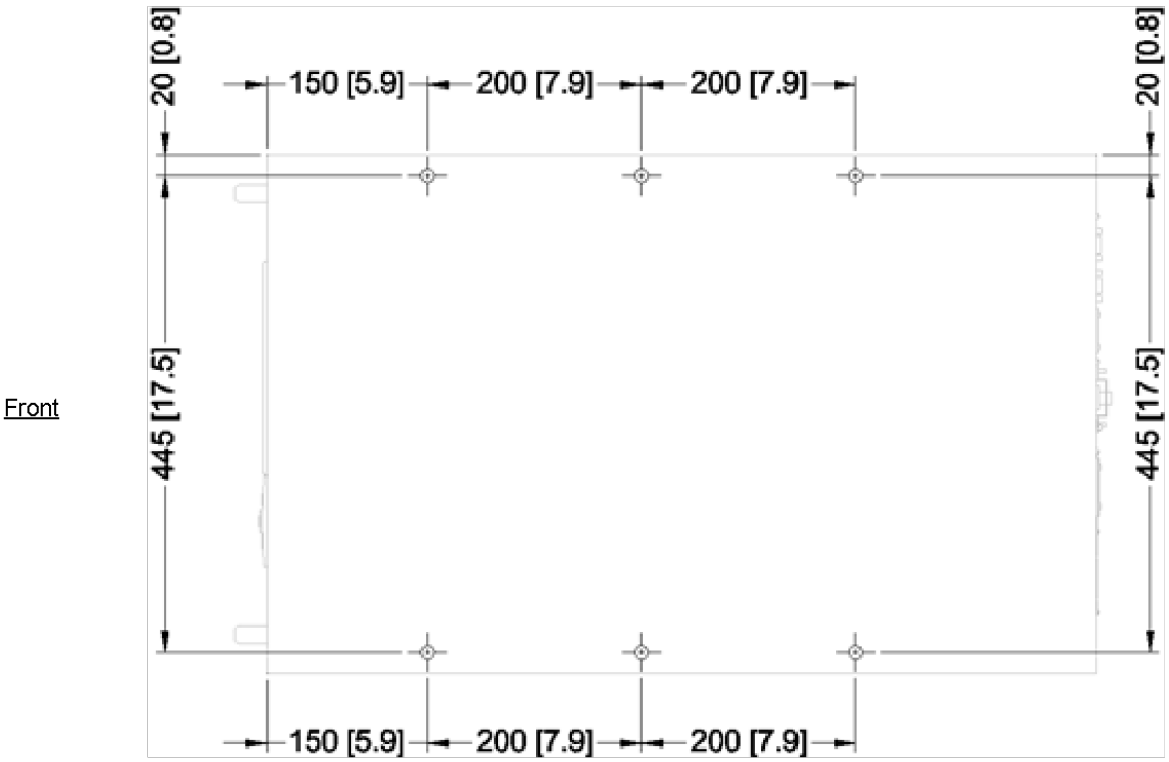
CHAPTER 2 - INSTALLATION PLAN AND UNPACKING



Left Side View

Right Side View

Fig 2-5: Floor Mounting Bracket-mounted the Sides of Cabinet



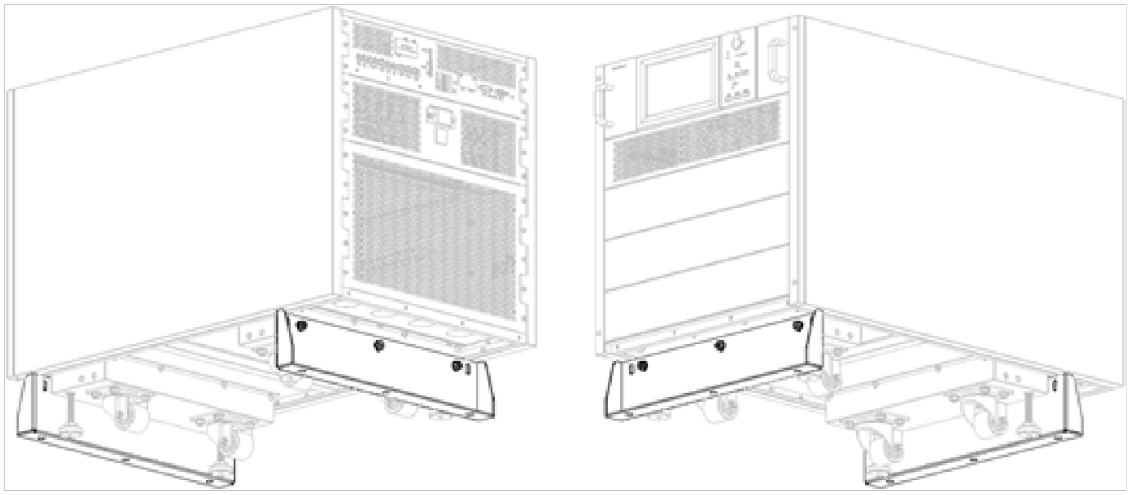
Front

mm [inch]

Bottom View

Fig 2-6: UPS Cabinet Floor Mounting Dimensions for Side-mounted

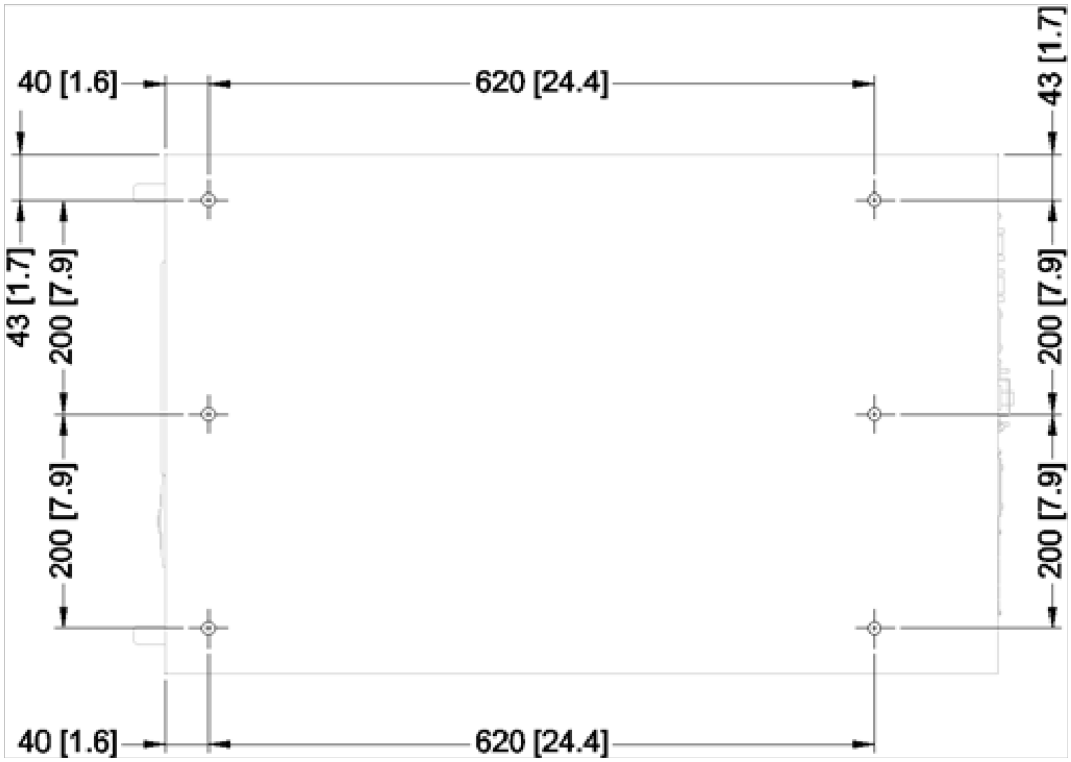
CHAPTER 2 - INSTALLATION PLAN AND UNPACKING



Rear Side View

Front Side View

Fig 2-7: Floor Mounting Bracket-mounted the Front and Back of Cabinet



mm [inch]

Bottom View

Fig 2-8: UPS Cabinet Floor Mounting Dimensions for Front- and Back-mounted

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

2.3 Power Wiring Preparation

Design the cables according to the descriptions in this section, local regulatory wiring standards, and the environmental conditions.

	**WARNING** FAILURE TO FOLLOW ADEQUATE EARTHING PROCEDURES CAN RESULT IN EMI, ELECTRIC SHOCK HAZARD, OR RISK OF FIRE, SHOLD AN EARTH FAULT OCCUR.

Read the following notes while performing the installation:

	**WARNING** Due to the potential for high leakage current for connected loads, the system must remain connected via a grounded outlet. Never disconnect the grounded outlet connection when the load is attached.

- Refer to national and local electrical codes for acceptable external wiring practices.
- Material and labor for external wiring requirements are to be provided by the customer.
- To allow for future power upgrades, recommends install the UPS using wiring and external overcurrent protection breakers sized for fully rated UPS kW frame size instead of the de-rated kW ordered. Wiring for the maximum kW frame size will allow a full power rating upgrade without having to modify the site wiring infrastructure.
- For external wiring, use 75°C copper wire. Wire sizes listed in Table 2-3 are for copper wiring only. If wire is run in an ambient temperature greater than 40°C, higher temperature wire and/or larger size wire may be necessary.
- Wire ampacities are chosen from Table 310-16 of the National Electrical Code® (NEC). Specification is for copper wire with a 75°C rating.
- Refer to NEC Article 250 and local codes for proper grounding practices.
- Supported single-feed or dual-feed power source:
    - 4 wire + grounded Wye (TT, TN) – Rectifier Input
    - 4 wire + grounded Wye (TT, TN) – Bypass Input
- Battery cabinet has provided optional input breaker and output breaker.
- The battery wiring used between the battery and the UPS should be a maximum of 20 meters and not allow a voltage drop of more than 2% of nominal DC voltage at rated battery current.
- Battery voltage is computed at 2 volts per cell as defined by Article 480 of the NEC. Rated battery current is computed at 2 volts per cell.
- Each battery cabinet has its own overcurrent protection device.

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

Table 2-5: Maximum Steady State AC and DC Current

UPS power (kW)	Rated current (A)					
	Main input current at full load*1*2		Output current at full load*2		Battery discharging current at E.O.D=1.67V/cell, no overload	
	208V	220V	208V	220V	20 Battery/ string	22 Battery/ string
40	135	127	112	105	220	200
30	101	96	84	79	165	150
20	68	64	56	53	110	100
10	34	32	28	26	55	50

Table 2-6: SM040KAMFA and SM020KAMFA UPS Cabinet Power Cable Size

Contents			10KVA	20KVA	30KVA	40KVA
Main Input	Cable Section (AWG)	L1	10	4	2	1/0
		L2	10	4	2	1/0
		L3	10	4	2	1/0
		N	10	4	2	1/0
Output	Cable Section (AWG)	L1	10	4	2	1/0
		L2	10	4	2	1/0
		L3	10	4	2	1/0
		N	10	4	2	1/0
Bypass Input	Cable Section (AWG)	L1	10	4	2	1/0
		L2	10	4	2	1/0
		L3	10	4	2	1/0
		N	10	4	2	1/0
Battery	Cable Section (AWG)	+	6	2	2/0	3/0
		-	6	2	2/0	3/0
		N	6	2	2/0	3/0
PE	Cable Section (AWG)	PE	10	8	6	6

Note: For external wiring, is based on 75°C copper wire.

Table 2-7: BCT3L9N125 and BCT6L9N225 Battery Cabinet Power Cable Size

Model	Connection		Minimum Conductor Size AWG			
			10kVA	20kVA		
BCT3L9N125	Input Breaker 100A (Optional)	L1	10	4		
		L2	10	4		
		L3	10	4		
		N	10	4		
	Output Breaker 100A (Optional)	L1	10	4		
		L2	10	4		
		L3	10	4		
		N	10	4		
	Battery(+)		6	2		
	Battery(N)		6	2		
	Battery(-)		6	2		
	Ground		10	8		
BCT6L9N225			10kVA	20kVA	30kVA	40kVA
	Input Breaker 175A (Optional)	L1	10	4	2	1/0
		L2	10	4	2	1/0
		L3	10	4	2	1/0
		N	10	4	2	1/0
	Output Breaker 175A (Optional)	L1	10	4	2	1/0
		L2	10	4	2	1/0
		L3	10	4	2	1/0
		N	10	4	2	1/0
	Battery(+)		6	2	2/0	3/0
	Battery(N)		6	2	2/0	3/0
	Battery(-)		6	2	2/0	3/0
	Ground		10	8	6	6

Note: For external wiring, is based on 75°C copper wire.

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

Table 2-8: Recommend Circuit Breaker Ratings				
Model	**Input Rating**	**Bypass Rating**	**Output Rating**	**Battery Rating**
10KVA	50A	50A	50A	75A
20KVA	100A	100A	100A	125A
30KVA	150A	150A	150A	175A
40KVA	175A	175A	175A	225A

The power wiring connections for this UPS cabinet and external battery cabinet are rated at 90°C.

Table 2-9: SM020KAMFA UPS Cabinet Cable Terminations Information							
		Connection Bolt Type and Size			**Tool Size**		**Torque**
UPS Cabinet Connections		Bolt Shank	Bolt Head 1	Bolt Head 2	Size Head 1	Size Head 2	Nm (lb in)
AC INPUT	L1	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L2	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L3	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	N	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
BYPASS INPUT	L1	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L2	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L3	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	N	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
AC OUTPUT	L1	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L2	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	L3	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
	N	M6	Hex	Phillips	10mm	6mm(#4)	4.4 (39)
BATTERY INPUT	(+)	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	(N)	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	(-)	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
Chassis Ground	PE	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)

Table 2-10: SM040KAMFA UPS Cabinet Cable Connections Information

		Connection Bolt Type and Size			Tool Size		Torque
UPS Cabinet Connections		Bolt Shank	Bolt Head 1	Bolt Head 2	Size Head 1	Size Head 2	Nm (lb in)
AC INPUT	L1	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L2	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L3	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	N	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
BYPASS INPUT	L1	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L2	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L3	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	N	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
AC OUTPUT	L1	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L2	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	L3	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
	N	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)
BATTERY INPUT	(+)	M10	Hex	Phillips	17mm	8mm(#5)	24.5 (217)
	(N)	M10	Hex	Phillips	17mm	8mm(#5)	24.5 (217)
	(-)	M10	Hex	Phillips	17mm	8mm(#5)	24.5 (217)
Chassis Ground	PE	M8	Hex	Phillips	13mm	6mm(#4)	13.3 (118)

Table 2-11: BCT3L9N125 Battery Cabinet Cable Connections Information

		Connection Bolt Type and Size			Tool Size		Torque
Battery Cabinet Connections		Bolt Shank	Bolt Head 1	Bolt Head 2	Size Head 1	Size Head 2	Nm (lbs/in)
BATTERY OUTPUT (Breaker)	(+)	1/4-20	Pen	Phillips	10.2mm	6mm(#4)	5.6 (50)
	(N)	1/4-20	Pen	Phillips	10.2mm	6mm(#4)	5.6 (50)
	(-)	1/4-20	Pen	Phillips	10.2mm	6mm(#4)	5.6 (50)
Chassis Ground	PE	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)
UPS AC INPUT (Input Breaker) (Option)	L1	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L2	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L3	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
Neutral Bus Bar	N	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)
AC INPUT (Input Breaker) (Option)	L1	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L2	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L3	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
Neutral Bus Bar	N	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)
UPS AC OUTPUT (Output Breaker) (Option)	L1	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L2	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L3	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
Neutral Bus Bar	N	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)
AC OUTPUT (Output Breaker) (Option)	L1	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L2	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
	L3	#10-24	Pen	Phillips	7.6mm	4mm(#2)	1.7 (15)
Neutral Bus Bar	N	M6	Hex	Phillips	10mm	5mm(#3)	4.4 (39)

Table 2-12: BCT6L9N225 Battery Cabinet Cable Connections Information

		Connection Bolt Type and Size			Tool Size		Torque
Battery Cabinet Connections		Bolt Shank	Bolt Head 1	Bolt Head 2	Size Head 1	Size Head 2	Nm (lbs./in)
BATTERY OUTPUT (Breaker)	(+)	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	(N)	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	(-)	M8	Cap	Allen	13mm	1/4”	13.3 (118)
Chassis Ground	PE	M8	Hex	Phillips	13mm	6mm(#4)	14.7 (130)
UPS AC INPUT (Input Breaker) (Option)	L1	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L2	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L3	M8	Cap	Allen	13mm	1/4”	13.3 (118)
Neutral Bus Bar	N	M8	Hex	Phillips	13mm	6mm(#4)	14.7 (130)
AC INPUT (Input Breaker) (Option)	L1	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L2	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L3	M8	Cap	Allen	13mm	1/4”	13.3 (118)
Neutral Bus Bar	N	M8	Hex	Phillips	13mm	6mm(#4)	14.7 (130)
UPS AC OUTPUT (Output Breaker) (Option)	L1	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L2	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L3	M8	Cap	Allen	13mm	1/4”	13.3 (118)
Neutral Bus Bar	N	M8	Hex	Phillips	13mm	6mm(#4)	14.7 (130)
AC OUTPUT (Output Breaker) (Option)	L1	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L2	M8	Cap	Allen	13mm	1/4”	13.3 (118)
	L3	M8	Cap	Allen	13mm	1/4”	13.3 (118)
Neutral Bus Bar	N	M8	Hex	Phillips	13mm	6mm(#4)	14.7 (130)

Table 2-13: SM020KAMFA UPS Cabinet Power Cable Connections Information

		Cable AWG	Lug PN	Cable AWG	Lug PN
UPS Cabinet Connections		10kVA	Lug #	20kVA	Lug #
AC INPUT	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
	N				
BYPASS INPUT	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
	N				
AC OUTPUT	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
	N				
BATTERY INPUT	(+)	6	RNB14-8 (14Φ)[1]	2	RNBS38-8 (14Φ)[1]
	(N)				
	(-)				
Chassis Ground	PE	10	RNBM5-6 (9Φ)[1]	8	RNBS8-6 (14Φ)[1]

[1] Shrink tube size

NOTICE These “Ring Terminals” are included in the accessory box.

The ring terminal part numbers are stamped upon them.

Processing of power cable and ring terminal:

1. The heat shrinkable tube is inserted onto the power cable.
2. Power cable crimping ring terminal.
3. Use a heat gun to tighten the heat shrink tube.

Table 2-14: SM040KAMFA UPS Cabinet Power Cable Connections Information

UPS Cabinet Connections		10kVA		20kVA		30kVA		40kVA	
		Cable AWG	Lug #	Cable AWG	Lug #	Cable AWG	Lug #	Cable AWG	Lug #
AC INPUT	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
	N								
BYPASS INPUT	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
	N								
AC OUTPUT	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
	N								
BATTERY INPUT	(+)	6	RNB14-8 (11Φ)[1]	2	RNBS38-10 (20Φ)[1]	2/0	RNB70-10 (20Φ)[1]	3/0	RNB80-10 (20Φ)[1]
	(N)								
	(-)								
Chassis Ground	PE	10	RNB5.5-8 (10Φ)[1]	8	RNBS8-8 (10Φ)[1]	6	RNB14-8 (11Φ)[1]	6	RNB14-8 (11Φ)[1]

[1] Shrink tube size

Table 2-15: BCT3L9N125 Battery Cabinet Power Cable Connections Information

Battery Cabinet Connections		10kVA		20kVA	
		Cable AWG	Lug #	Cable AWG	Lug #
BATTERY OUTPUT (Battery Breaker)	(+)	6	RNB14-8 (14Φ)[1]	2	RNBS38-8 (14Φ)[1]
	(N)				
	(-)				
Chassis Ground	PE	10	RNBM5-6 (9Φ)[1]	8	RNBS8-6 (9Φ)[1]
UPS AC INPUT (Input Breaker) (Option)	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
Neutral Bus Bar	N	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
AC INPUT (Input Breaker) (Option)	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
Neutral Bus Bar	N	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
UPS AC OUTPUT (Output Breaker) (Option)	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
Neutral Bus Bar	N	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
AC OUTPUT (Output Breaker) (Option)	L1	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]
	L2				
	L3				
Neutral Bus Bar	N	10	RNBM5-6 (9Φ)[1]	4	RNBS22-6 (14Φ)[1]

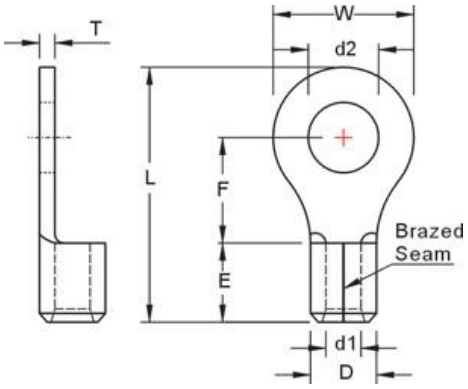
[1] Shrink tube size.

Table 2-16: BCT6L9N225 Battery Cabinet Power Cable Connections Information

		10kVA		20kVA		30kVA		40kVA	
Battery Cabinet Connections		Cable AWG	Lug #	Cable AWG	Lug #	Cable AWG	Lug #	Cable AWG	Lug #
BATTERY OUTPUT (Battery Breaker)	(+)	6	RNB14-10 (11Φ)[1]	2	RNBS38-10 (20Φ)[1]	2/0	RNB70-10 (20Φ)[1]	3/0	RNB80-10 (20Φ)[1]
	(N)								
	(-)								
Chassis Ground	PE	10	RNB5.5-8 (10Φ)[1]	8	RNB8-8 (10Φ)[1]	6	RNB14-8 (11Φ)[1]	6	RNBS14-8 (11Φ)[1]
UPS AC INPUT (Input Breaker) (Option)	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
Neutral Bus Bar	N	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
AC INPUT (Input Breaker) (Option)	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
Neutral Bus Bar	N	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
UPS AC OUTPUT (Output Breaker) (Option)	L1	10	RNB14-8 (11Φ)[1]	4	RNBS38-10 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
Neutral Bus Bar	N	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
AC OUTPUT (Output Breaker) (Option)	L1	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]
	L2								
	L3								
Neutral Bus Bar	N	10	RNB5.5-8 (10Φ)[1]	4	RNB22-8 (20Φ)[1]	2	RNBS38-8 (20Φ)[1]	1/0	RNB60-8 (20Φ)[1]

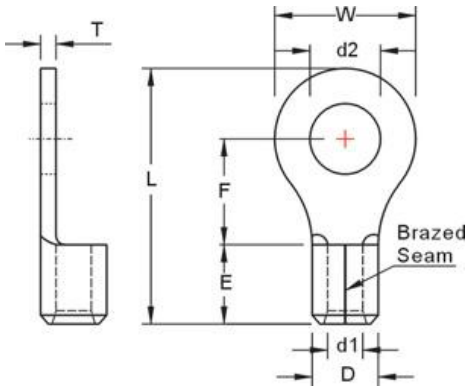
[1] Shrink tube size

Table 2-17: SM020KAMFA UPS Cabinet Power Cable Connections Size



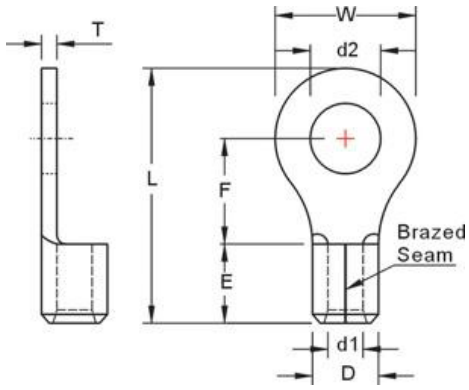
UPS Cabinet Connections		Max W	Max I	Max F	Max d2
AC INPUT	L1	17mm	33.5mm	10.5mm	6.4mm
	L2				
	L3				
	N				
BYPASS INPUT	L1	17mm	33.5mm	10.5mm	6.4mm
	L2				
	L3				
	N				
AC OUTPUT	L1	17mm	33.5mm	10.5mm	6.4mm
	L2				
	L3				
	N				
BATTERY INPUT	(+)	22mm	42.7mm	8mm	6.4mm
	(N)				
	(-)				
Chassis Ground	PE	17mm	29.7mm	9mm	6.4mm

Table 2-18: SM040KAMFA UPS Cabinet Power Cable Connections Size



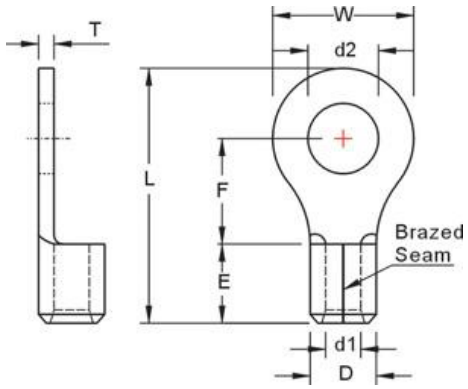
UPS Cabinet Connections		Max W	Max I	Max F	Max d2
AC INPUT	L1	22mm	49.7mm	12mm	8.4mm
	L2				
	L3				
	N				
BYPASS INPUT	L1	22mm	49.7mm	12mm	8.4mm
	L2				
	L3				
	N				
AC OUTPUT	L1	22mm	49.7mm	12mm	8.4mm
	L2				
	L3				
	N				
BATTERY INPUT	(+)	29mm	54.2mm	14m	10.5mm
	(N)				
	(-)				
Chassis Ground	PE	21mm	32.5mm	10mm	8.4mm

Table 2-19: BCT3L9N125 Battery Cabinet Power Cable Connections Size



Battery Cabinet Connections		Max W	Max I	Max F	Max d2
BATTERY OUTPUT (Battery Breaker)	(+)	25mm	42.7mm	9.5mm	8.4mm
	(N)				
	(-)				
Chassis Ground	PE	17mm	29.2mm	9mm	6.4mm
UPS AC INPUT (Input Breaker) (Option)	L1	18mm	33.5mm	6mm	6.4mm
	L2				
	L3				
Neutral Bus Bar	N	20mm	33.5mm	11mm	6.4mm
AC INPUT (Input Breaker) (Option)	L1	18mm	33.5mm	11mm	6.4mm
	L2				
	L3				
Neutral Bus Bar	N	20mm	33.5mm	11mm	6.4mm
UPS AC OUTPUT (Output Breaker) (Option)	L1	18mm	33.5mm	6m	6.4mm
	L2				
	L3				
Neutral Bus Bar	N	20mm	33.5mm	11mm	6.4mm
AC OUTPUT (Output Breaker) (Option)	L1	18mm	33.5mm	6m	6.4mm
	L2				
	L3				
Neutral Bus Bar	N	20mm	33.5mm	11mm	6.4mm

Table 2-20: BCT6L9N225 Battery Cabinet Power Cable Connections Size



Battery Cabinet Connections		Max W	Max I	Max F	Max d2
BATTERY OUTPUT (Battery Breaker)	(+)	27mm	54.2mm	15mm	10.5mm
	(N)				
	(-)				
Chassis Ground	PE	21mm	32.5mm	10mm	8.4mm
UPS AC INPUT (Input Breaker) (Option)	L1	22mm	49.7mm	13mm	8.4mm
	L2				
	L3				
Neutral Bus Bar	N	21mm	32.5mm	13mm	8.4mm
AC INPUT (Input Breaker) (Option)	L1	22mm	49.7mm	13mm	8.4mm
	L2				
	L3				
Neutral Bus Bar	N	21mm	32.5mm	13mm	8.4mm
UPS AC OUTPUT (Output Breaker) (Option)	L1	22mm	49.7mm	13mm	8.4mm
	L2				
	L3				
Neutral Bus Bar	N	21mm	32.5mm	13mm	8.4mm
AC OUTPUT (Output Breaker) (Option)	L1	22mm	49.7mm	13mm	8.4mm
	L2				
	L3				
Neutral Bus Bar	N	21mm	32.5mm	13mm	8.4mm

Recommended Crimping Tool

Cable lug manufacturer: K.S.T.

Crimping tool manufacturer: Burndy - Hubbell

Table 2-21: Recommended Crimping Tools

Cable Size (AWG)	Cable Lug Type	Crimping Tool	Die
10	RNBM5-6, RNB5.5-8	Y8MRB-1	
8	RNBS8-6, RNB8-8	Y8MRB-1	
6	RNB14-8, RNB14-10	Y35, PAT750	UV6L
4	RNBS22-6, RNB22-8	Y35, PAT750	U2CD1
2	RNBS38-8, RNBS38-10	Y35, PAT750	U1CD1
1/0	RNB60-8	Y35, PAT750	UV26L
2/0	RNB70-10	Y35, PAT750	U28D1
3/0	RNB80-10	Y35, PAT750	U29D1

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

2.4 Inspecting and Unpacking

The UPS cabinets and battery cabinets are shipped bolted to a wooden pallet and covered with protective packaging material (see Fig 2-9).

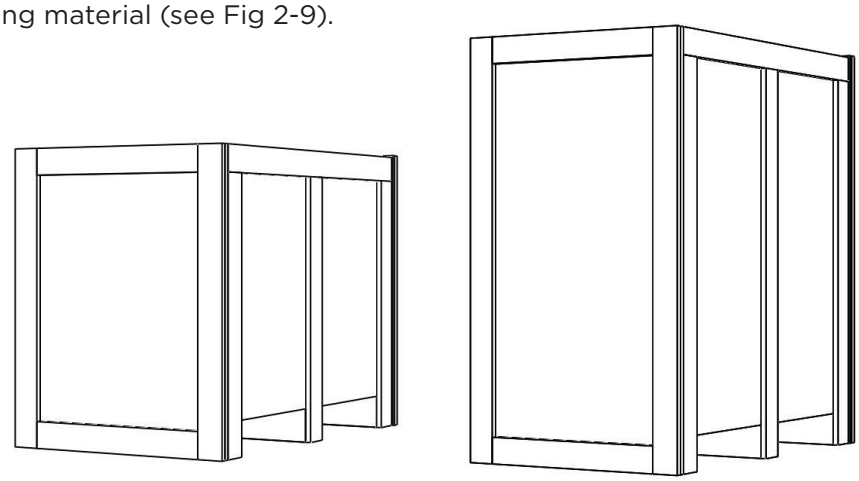


Fig 2-9: UPS and Battery Cabinets Shipped on Pallet

⚠	**WARNING** The UPS and battery cabinets are heavy (see Table 2-1 and 2-2). If unpacking and unloading instructions are not closely followed, the cabinet may tip and cause serious injury.
⚠	**NOTICE** For the following step, verify that the forklift or pallet jack is rated to handle the weight of the cabinet.

- Carefully inspect the outer packaging for evidence of damage during transit.
- 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 cabinet more than 10° from vertical. Damage may occur only when lifting the cabinet with a forklift.

- Set the pallet on a firm, level surface, allowing a minimum clearance of 2m(6.56ft) on each side for removing the cabinet from the pallet.

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

1. Remove the bolts from the outer shipping crates.
2. Remove the protective packaging material from the cabinet and recycle in a responsible manner.
3. Retain the front wooden panel for later use.
4. 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 service representative immediately to determine the extent of the damage and its impact on further installation.

⚠	**NOTICE** The SM040KAMFA and BCT6L9N225 retain the front wooden panel. The SM020KAMFA and BCT3L9N125 retain the top wooden panel.

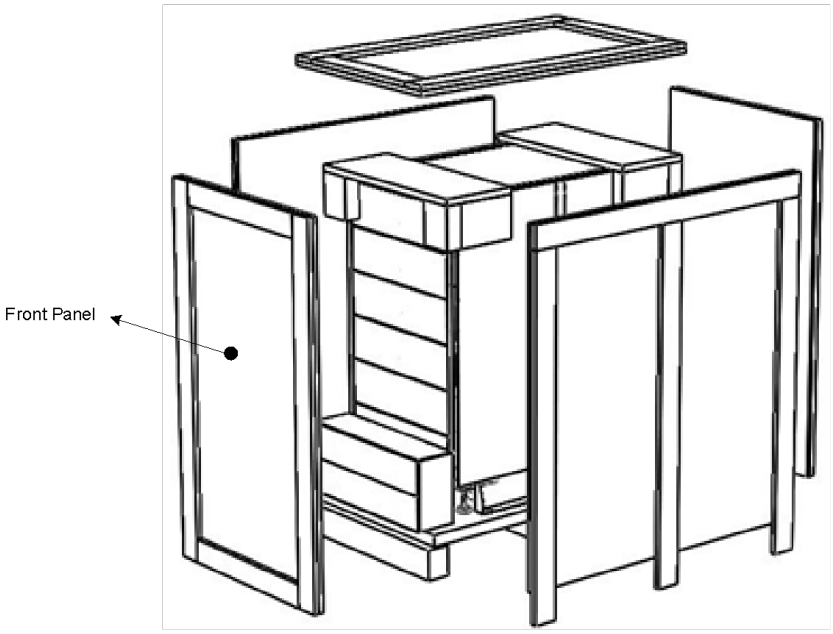


Fig 2-10: Remove the Wood Crates of UPS Cabinets

CHAPTER 2 - INSTALLATION PLAN AND UNPACKING

2.5 Unloading the UPS and Battery Cabinets from the Pallet

⚠	**WARNING** The UPS and battery cabinets are heavy (see Table 2-1 and 2-2). If unpacking and unloading instructions are not closely followed, the cabinet may tip and cause serious injury.
⚠	**NOTICE** For the following step, verify that the forklift or pallet jack is rated to handle the weight of the cabinet.

The UPS and external battery cabinets are bolted to a wooden pallet supported by wood skids.

⚠	• **WARNING** Ensure a minimum of 2 meters in front of the battery cabinet for unloading. The area in front of the battery cabinet must be unobstructed. • The unloading floor must be smooth, with no cracks or large seams to prevent a smooth roll-off of the cabinet.

To unload the UPS cabinet or battery cabinet from pallet:

1. Remove the accessory pack.
2. Use a forklift or pallet jack to move the battery 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.
3. If the leveling feet are not fully retracted, turn all four leveling feet until they are retracted into the cabinet.
4. Drop the front wooden panel and attach the ramp to the front of the pallet. (see Fig 2-11)
5. Use a Phillips screwdriver or a socket wrench (13mm) to remove bolts securing the right shipping bracket to the cabinet and use socket wrench(bottom, 16mm) and open wrench (up, 17mm) to remove two bolts securing the bracket to the pallet (see Fig 2-12). Remove the right shipping bracket. If installing the cabinet permanently, retain the shipping bracket and securing hardware for later use.

⚠	**NOTICE** The SM040KAMFA and BCT6L9N225 used the front wooden panel. The SM020KAMFA and BCT3L9N125 used the top wooden panel. .

6. Use a Phillips screwdriver or a socket wrench (13mm) to remove bolts securing the left shipping bracket to the cabinet and use socket wrench (bottom, 16mm) and open wrench (up, 17mm) to remove two bolts securing the bracket to the pallet (see Fig 2-13). Remove the left shipping bracket. If installing the cabinet permanently, retain the shipping bracket and securing hardware for later use.
7. Slowly roll the cabinet toward the front of the pallet. Continue rolling the cabinet down the ramp until the cabinet is clear of the ramp.
8. Roll the battery cabinet to the final installation location on the side of the UPS cabinet and making sure the doors are flush with each other.

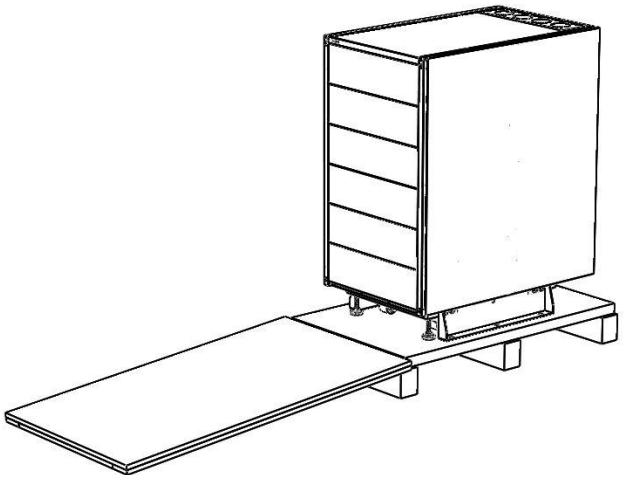


Fig 2-11: Front Wooden Panel Acts as a Ramp – BCT6L9N225

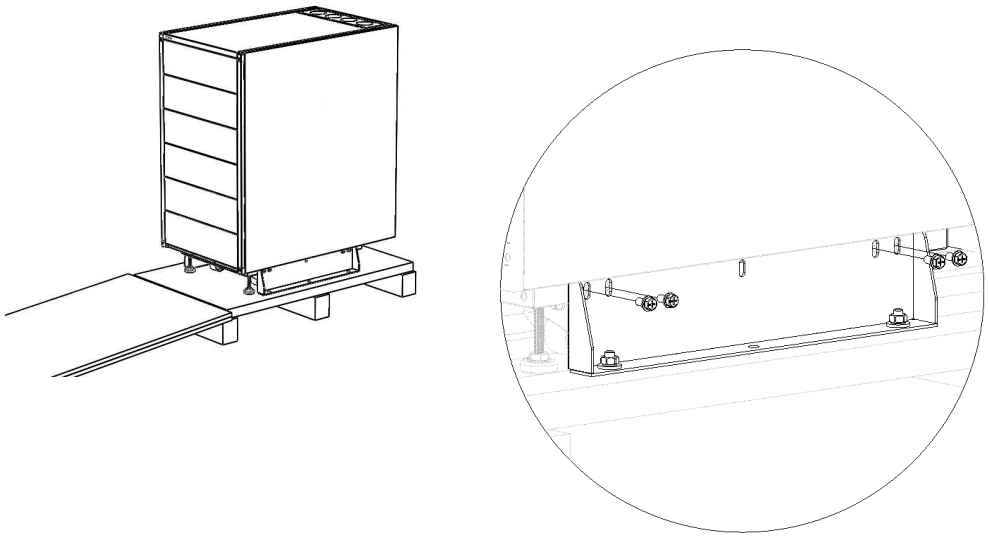


Fig 2-12: Removing the Right Shipping Bracket – BCT6L9N225

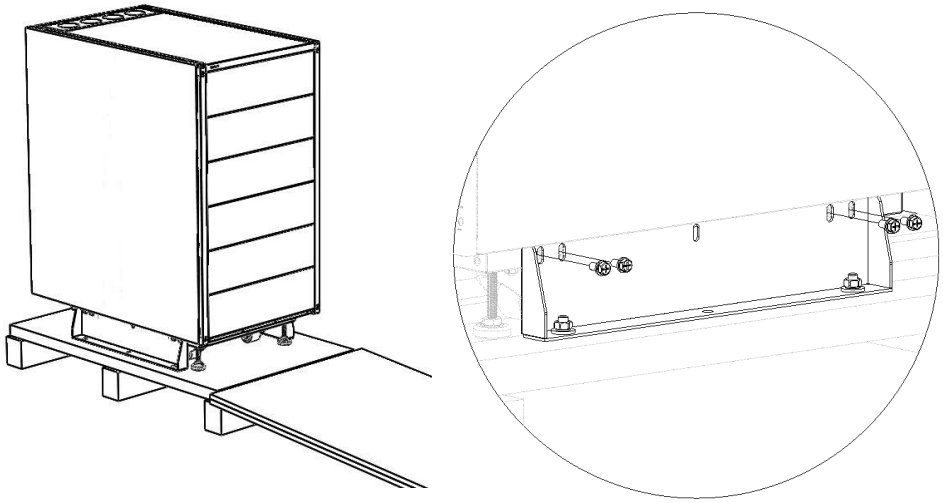


Fig 2-13: Removing the Left Shipping Bracket – BCT6L9N225

⚠	**WARNING** 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.

9. If installing the cabinet permanently, retain the shipping brackets and hardware; otherwise, recycle the pallet, and shipping brackets in a responsible manner.
10. Use open wrench (19mm) to secure the battery cabinet in position by lowering the leveling feet until the cabinet is locked in place.
11. If permanently mounting the battery cabinet, proceed to Step 12.
12. Using the retained hardware, reinstall the floor brackets removed in Steps 4 and 5 to the right and left of the battery cabinet with the angle facing outward (see Fig 2-12 and Fig 2-13).

⚠	**NOTICE** Use leveling feet only to lock the cabinet in place. Using the leveling feet to raise the cabinet may result in serious injury to personnel or damage to the cabinet.

13. Secure the cabinet to the floor with customer-supplied hardware.

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

3.1 UPS and Battery Cabinet Composition

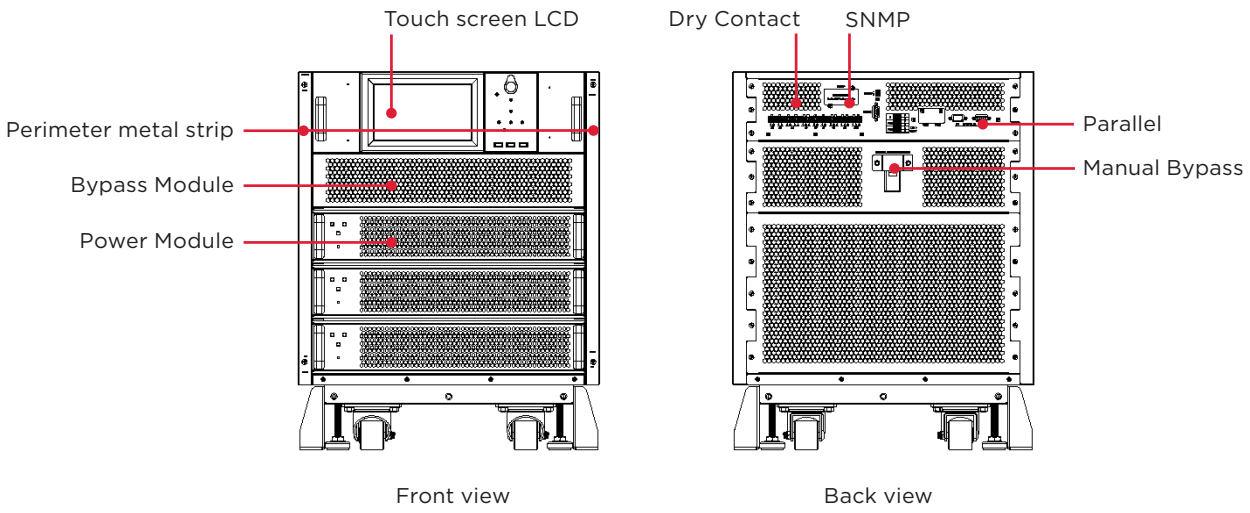


Fig.3-1: SM-20kVA UPS Cabinet

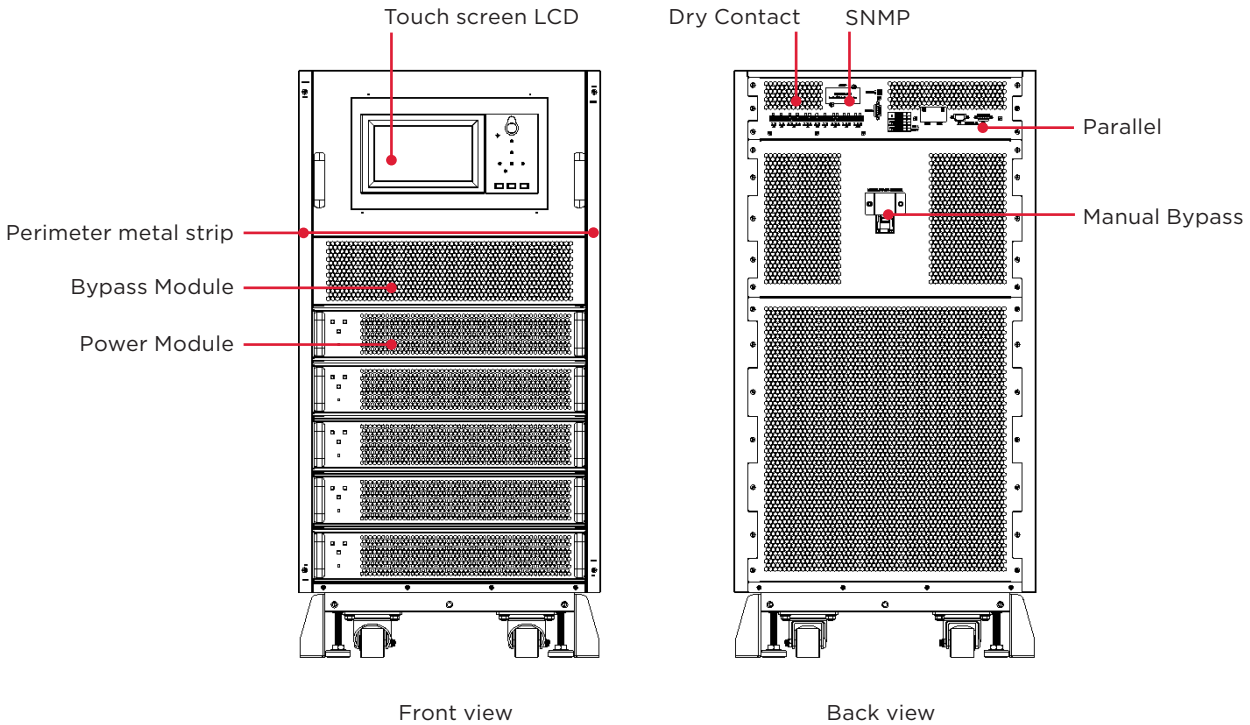


Fig.3-2: SM-40kVA UPS Cabinet

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

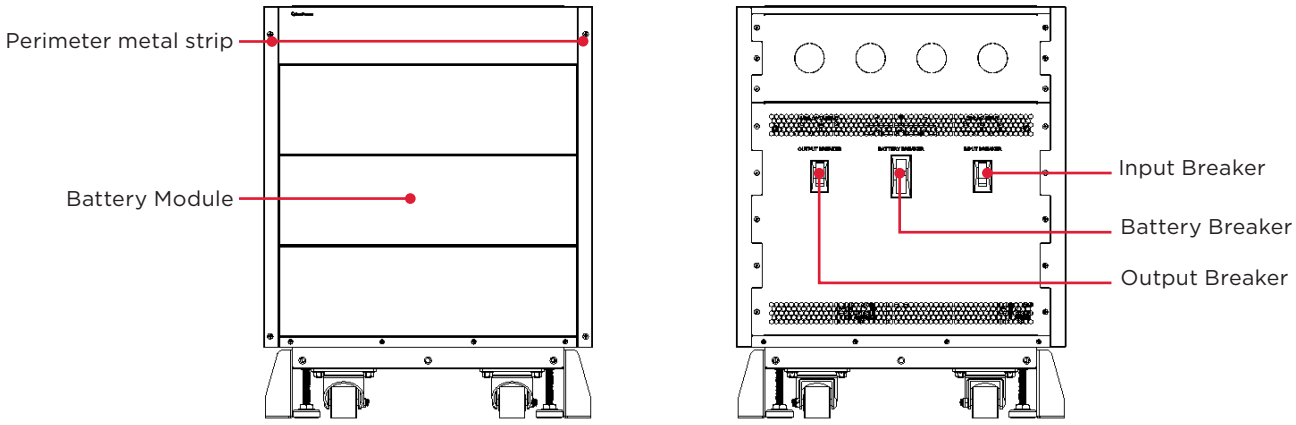


Fig.3-3: BCT3L9N125 Battery Cabinet

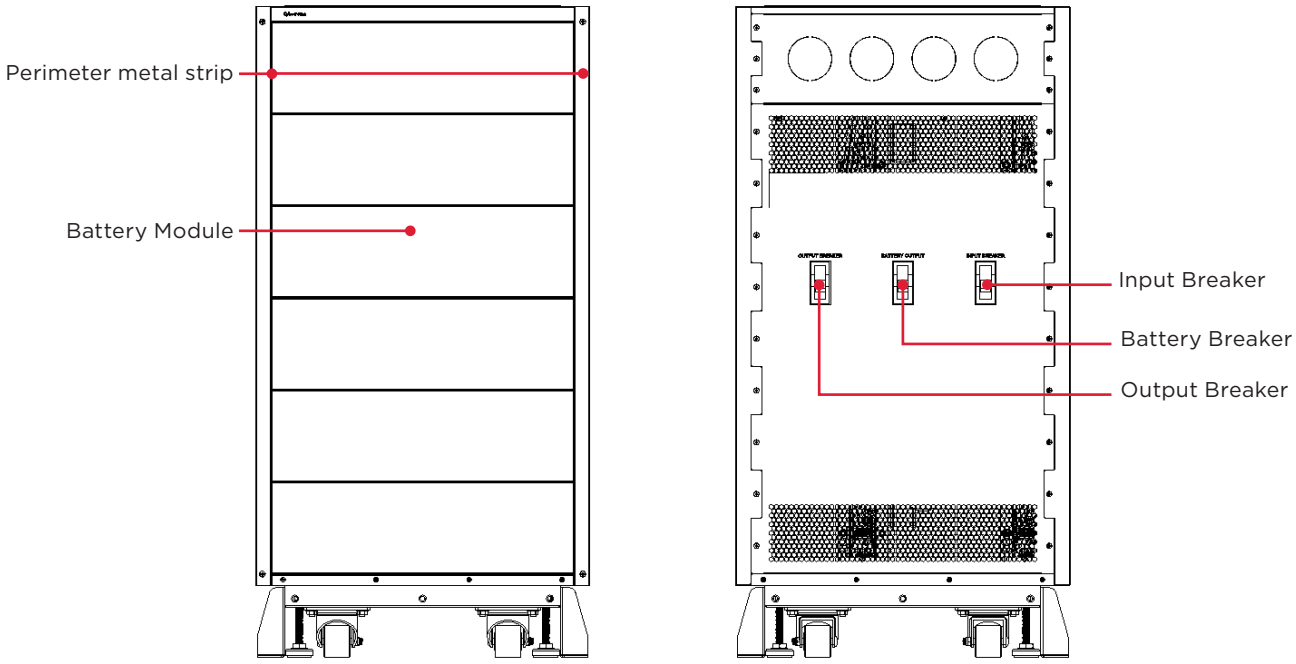


Fig.3-4: BCT6L9N225 Battery Cabinet

⚠	**NOTICE** The input and output breakers are optional.

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

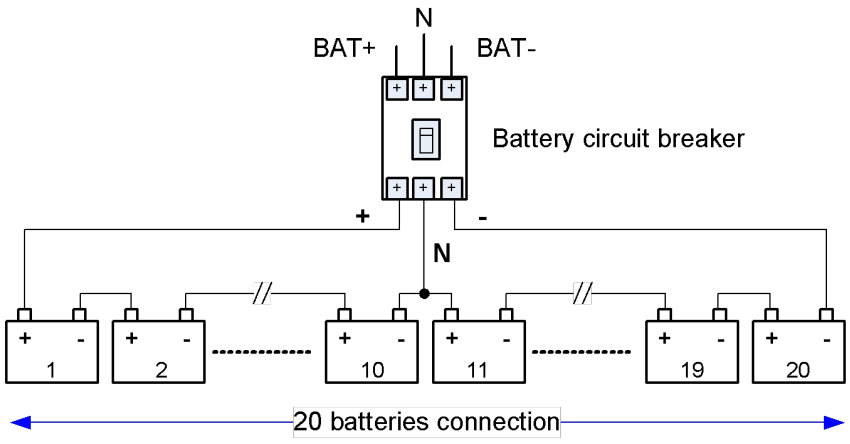


Fig 3-5: Diagram of Battery Connections

Table 3-1: UPS Cabinet Major Components			
Item	**Component**	**Quantity**	**Remarks**
1	System Display	1	Requisite, factory installed
2	Bypass module	1	Requisite, factory installed
3	Manual bypass breaker	1	Requisite, factory installed
4	Power module	1 ≤n ≤5	Requisite
5	Perimeter metal strip	2	Factory installed

Table 3-2: Battery Cabinet Major Components			
Item	**Component**	**Quantity**	**Remarks**
1	Input breaker	1	Optional
2	Output breaker	1	Optional
3	Battery breaker	1	Requisite, factory installed
4	Battery module	2 ≤n ≤12	Requisite
5	Perimeter metal strip	2	Factory installed

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

3.2 System Configurations

3.2.1 Standard Configuration

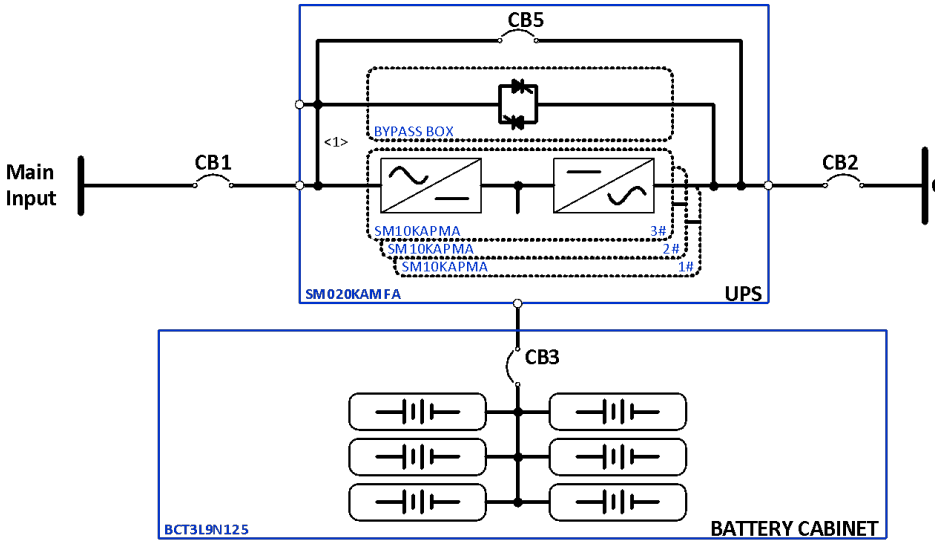


Fig 3-6: Standard Configuration for SM-20kVA UPS with BCT3L9N125

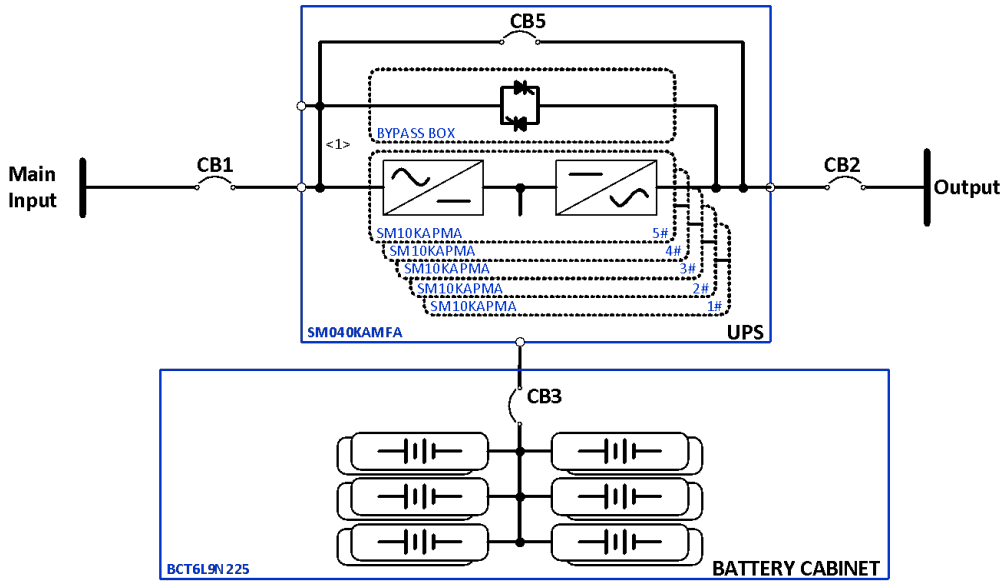


Fig 3-7: Standard Configuration for SM-40kVA UPS with BCT6L9N225

3.2.2 Optional Configuration

The standard battery cabinet has included one optional input breaker and one optional output breaker for UPS.

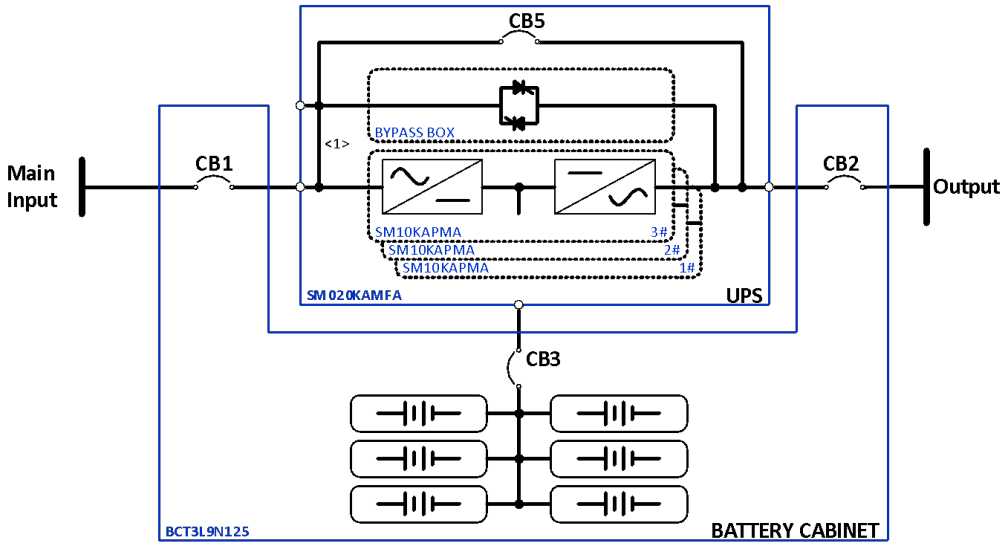


Fig 3-8: SM-20kVA UPS with BCT3L9N125 and Optional Breakers

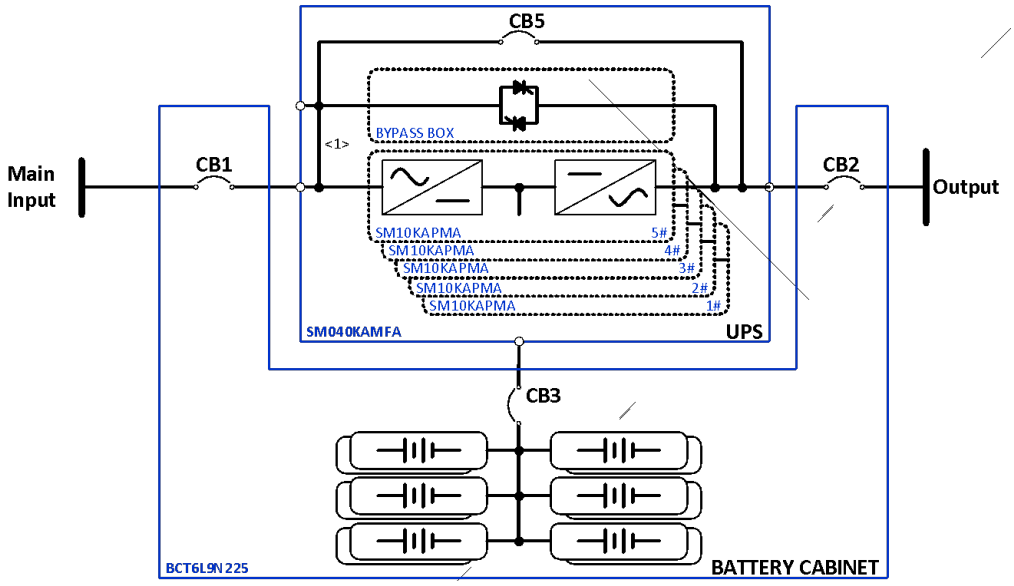


Fig 3-9: SM-40kVA UPS with BCT6L9N225 and Optional Breakers

3.2.3 Dual-Feed with Standard Configuration

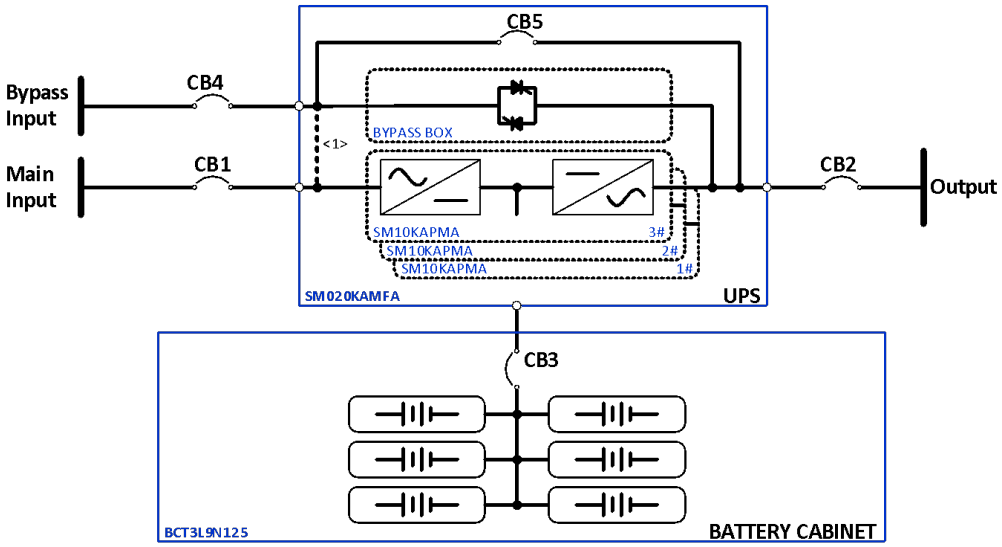


Fig 3-10: Dual Feed with SM-20kVA Standard Configuration

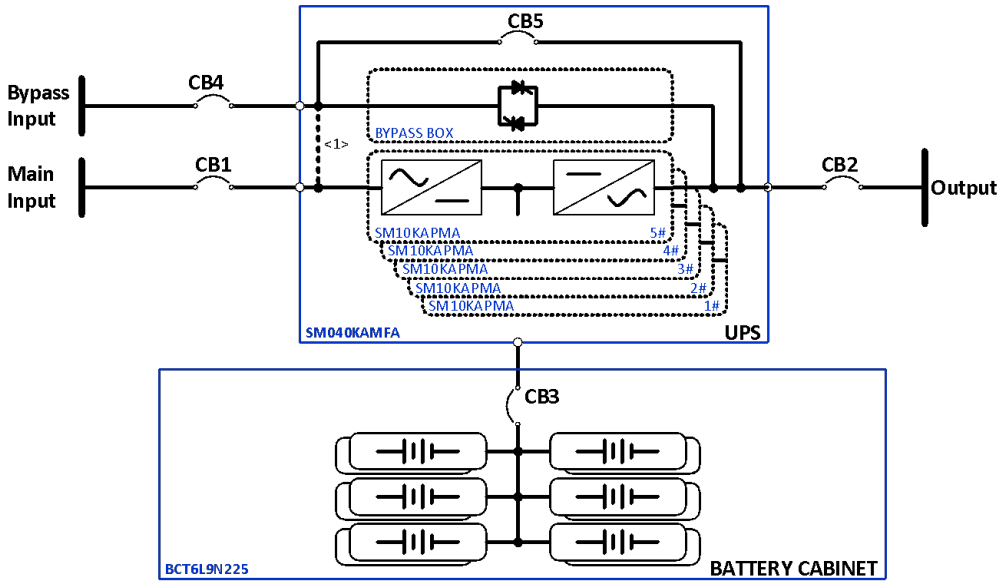


Fig 3-11: Dual Feed with SM-40kVA Standard Configuration

NOTICE 3 of the 4 bus bars are removed at the “Bypass Input” connection block.

3.2.4 Dual-Feed with Optional Configuration

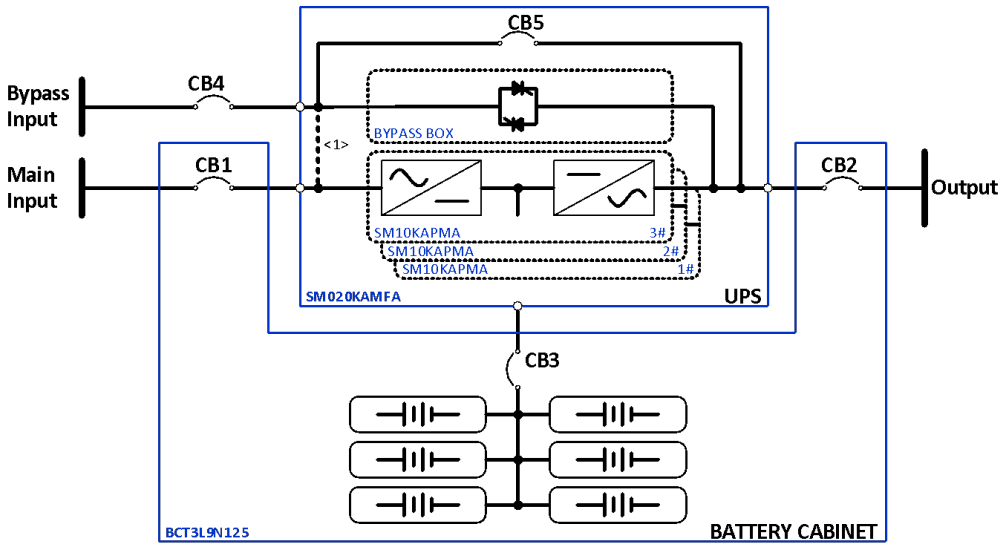


Fig 3-12: Dual Feed with SM-20kVA Optional Configuration

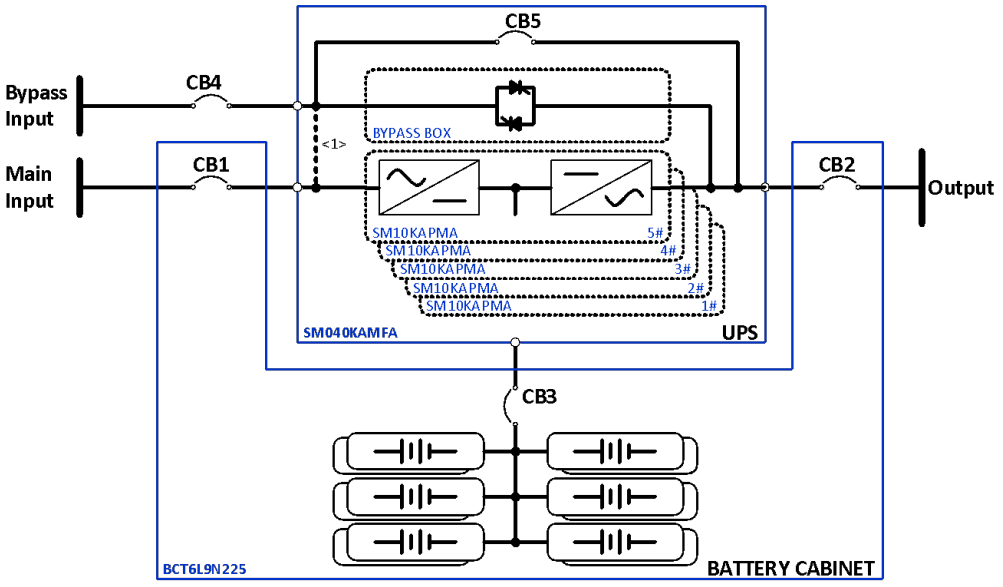


Fig 3-13: Dual Feed with SM-40kVA Optional Configuration

3.2.5 Single-Feed Parallel Configuration

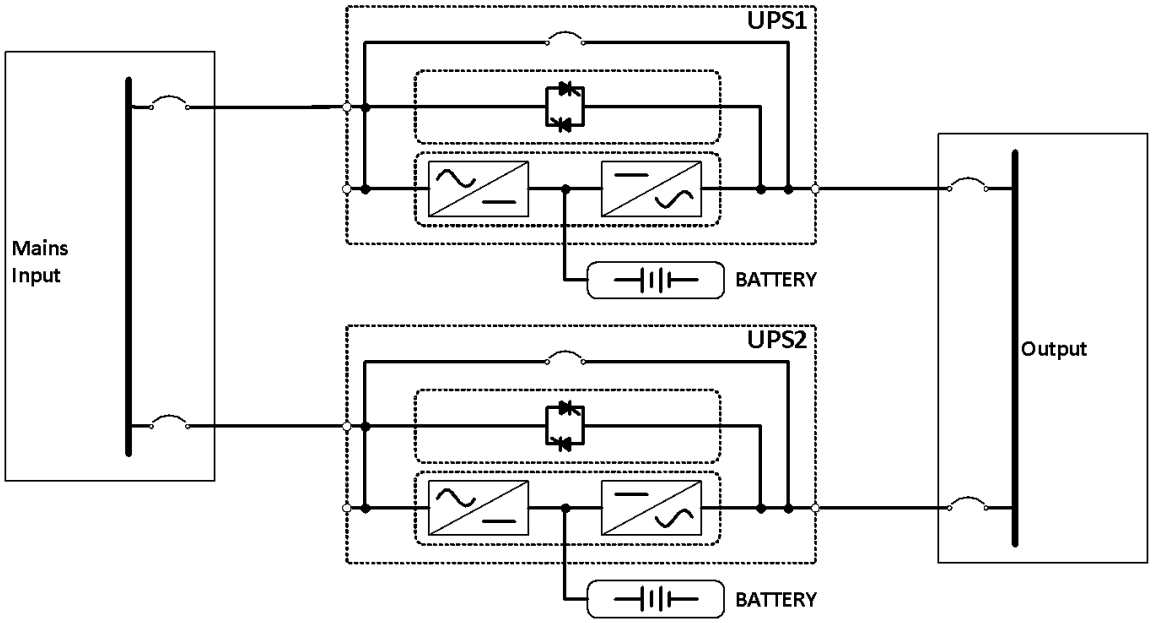


Fig 3-14: Single Feed Parallel Configuration

3.2.6 Dual-Feed Parallel Configuration

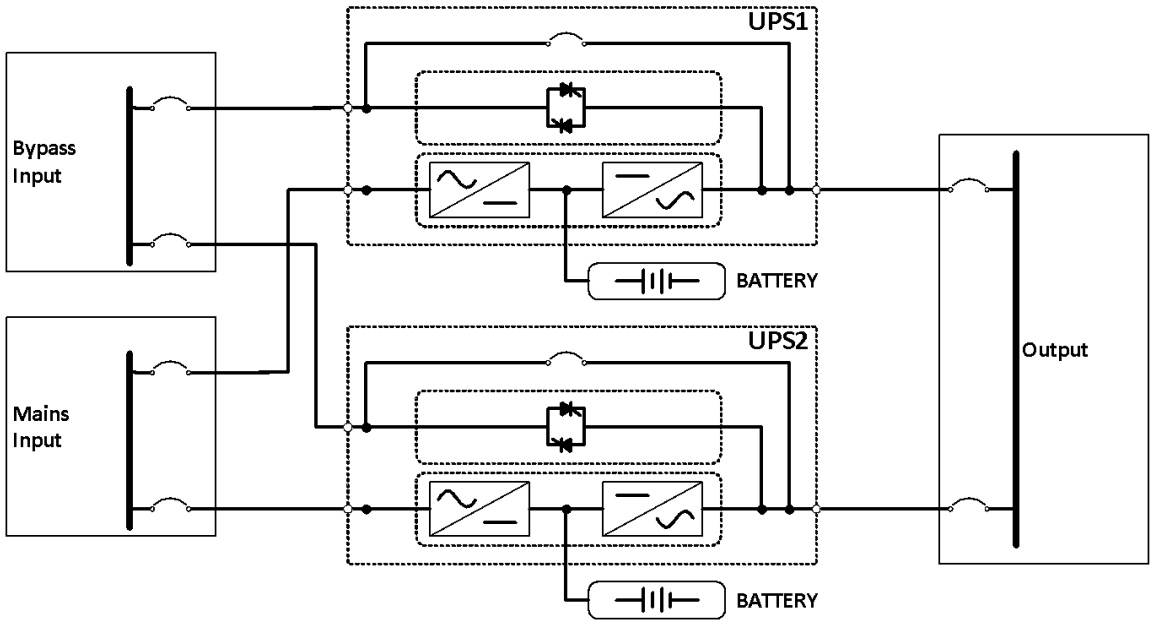


Fig 3-15: Dual Feed Parallel Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

3.3 Wiring Diagrams

3.3.1 Side-by-Side Installation Wiring Diagrams

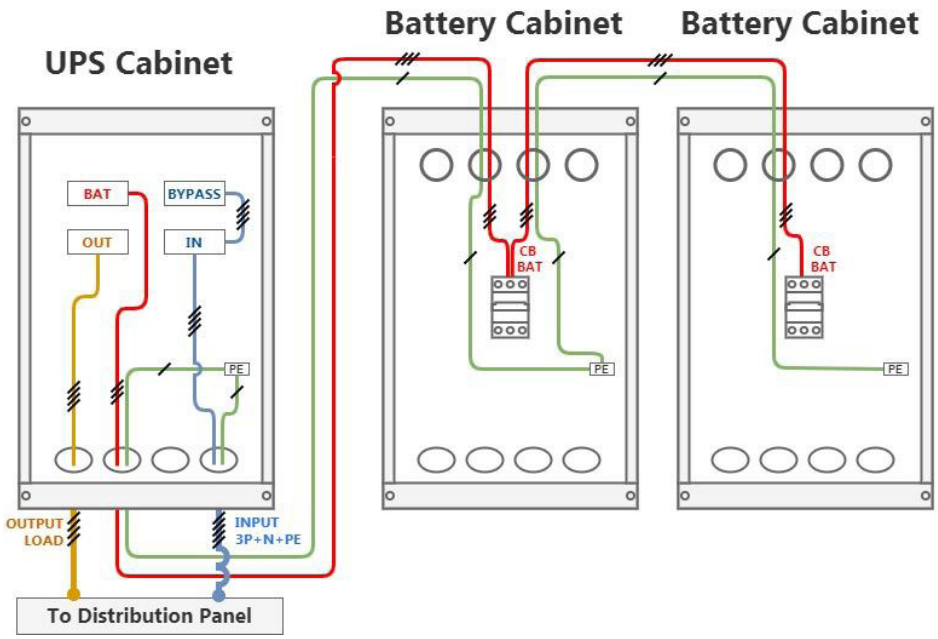


Fig 3-16: Side-by-Side Installation Wiring for Single-Feed with Standard Configuration

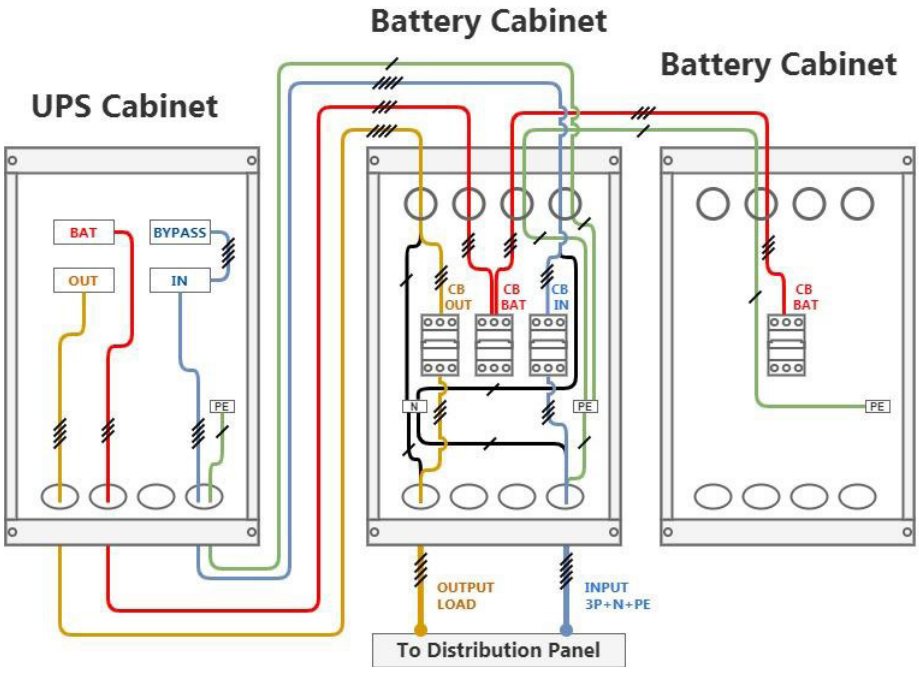


Fig 3- 17: Side-by-Side Installation Wiring for Single-Feed with Optional Configuration

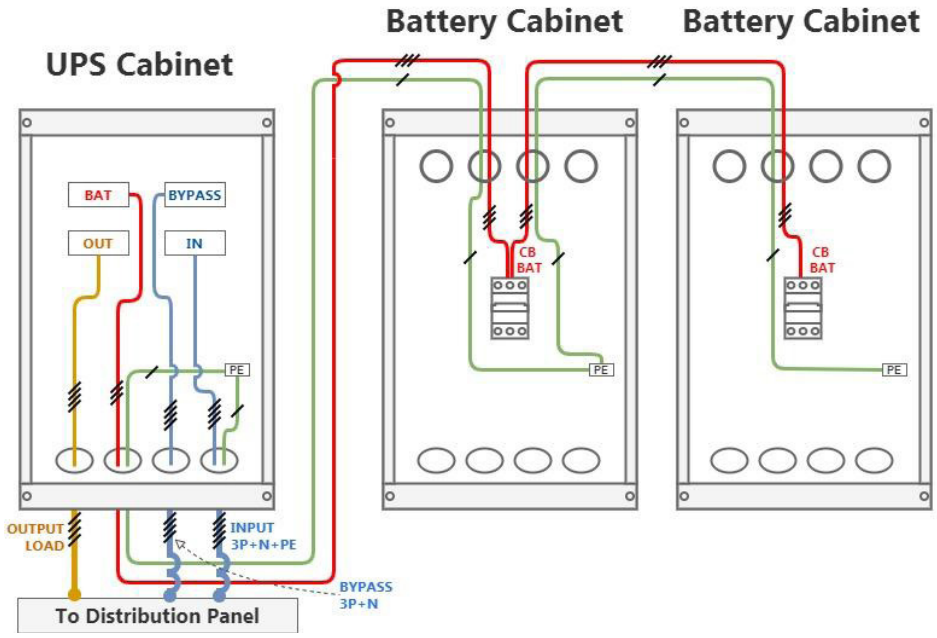


Fig 3-18: Side-by-Side Installation Wiring for Dual-Feed with Standard Configuration

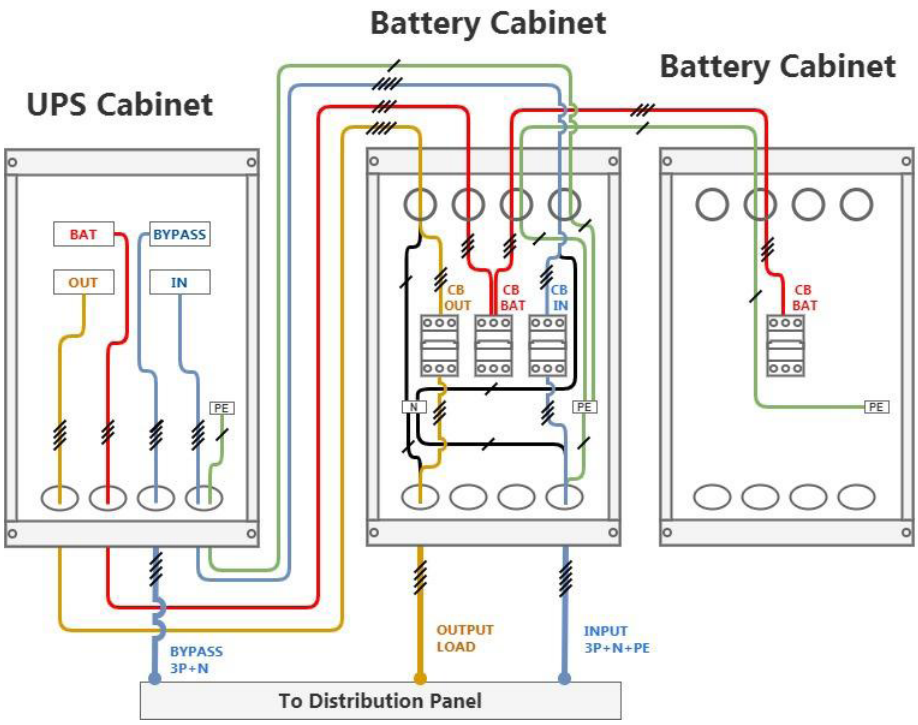


Fig 3-19: Side-by-Side Installation Wiring for Dual-Feed with Optional Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

3.3.2 Tower-Stacked and Rack-Mounted Installation Wiring Diagram

⚠	**NOTICE** The wiring for the tower-stacked and rack-mounted installations are identical. Shown: tower-stacked

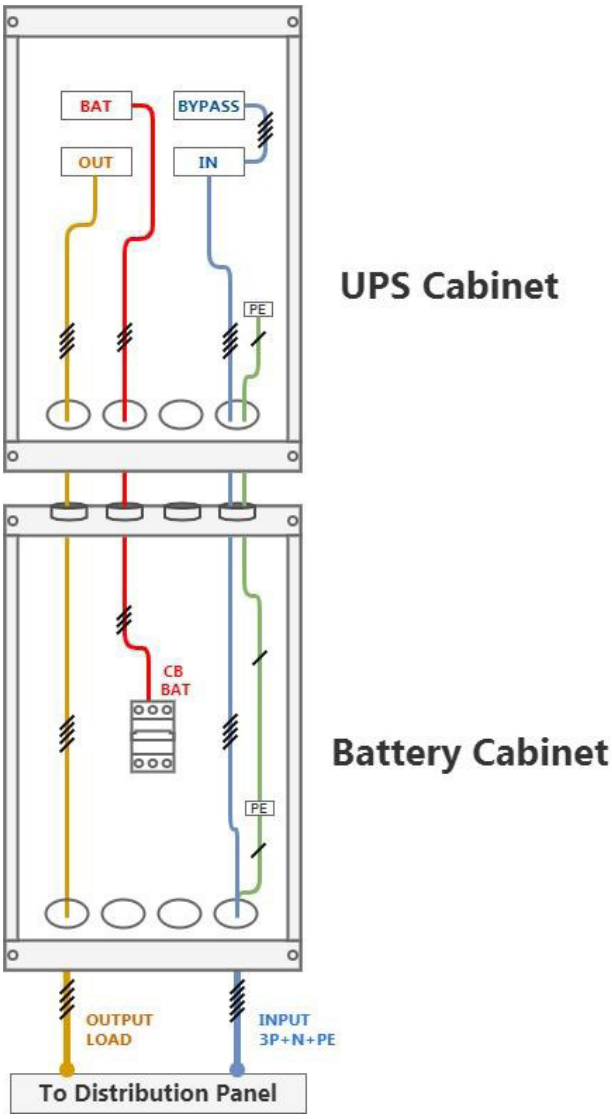


Fig 3-20: Tower-Stacked Installation Wiring for Single-Feed with Standard Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

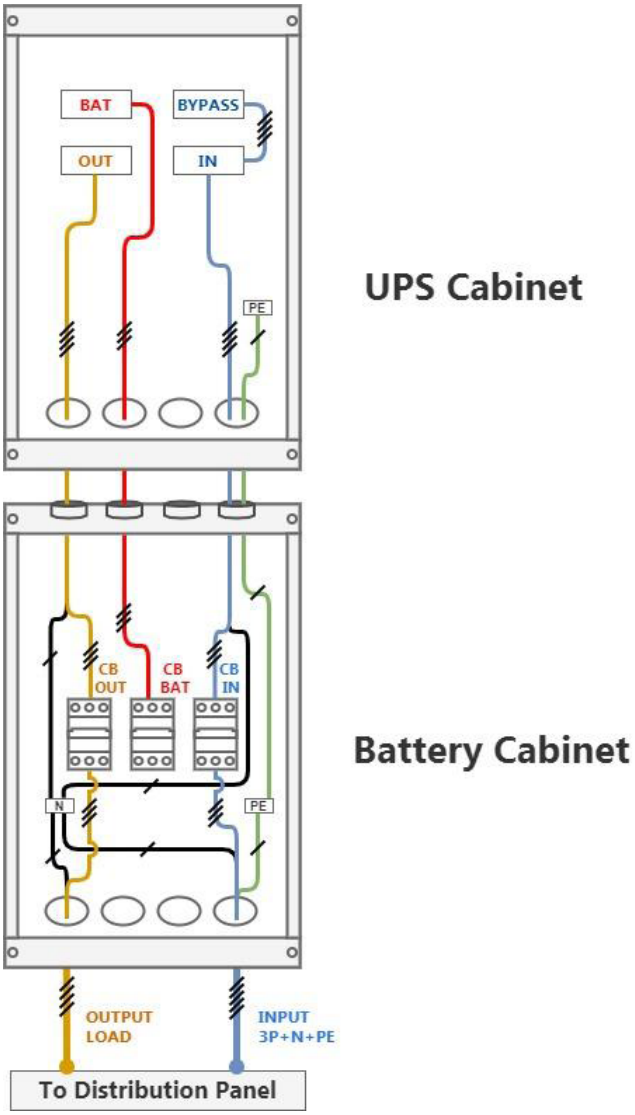


Fig 3-21: Tower-Stacked installation Wiring for Single-Feed with Optional Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

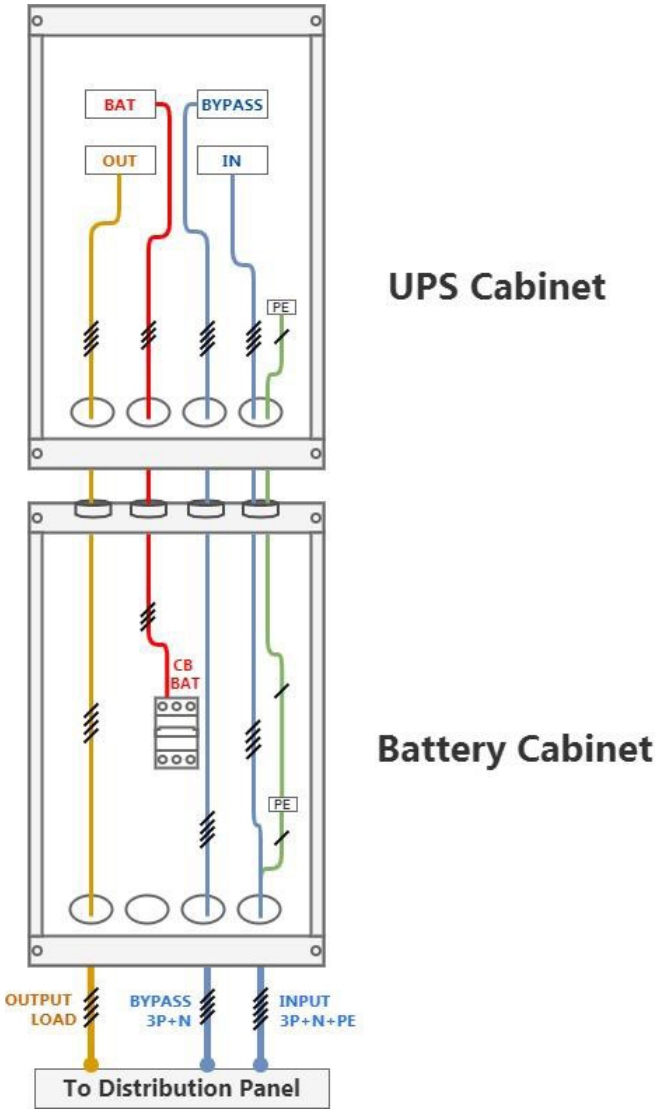


Fig 3-22: Tower-Stacked Installation Wiring for Dual-Feed with Standard Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

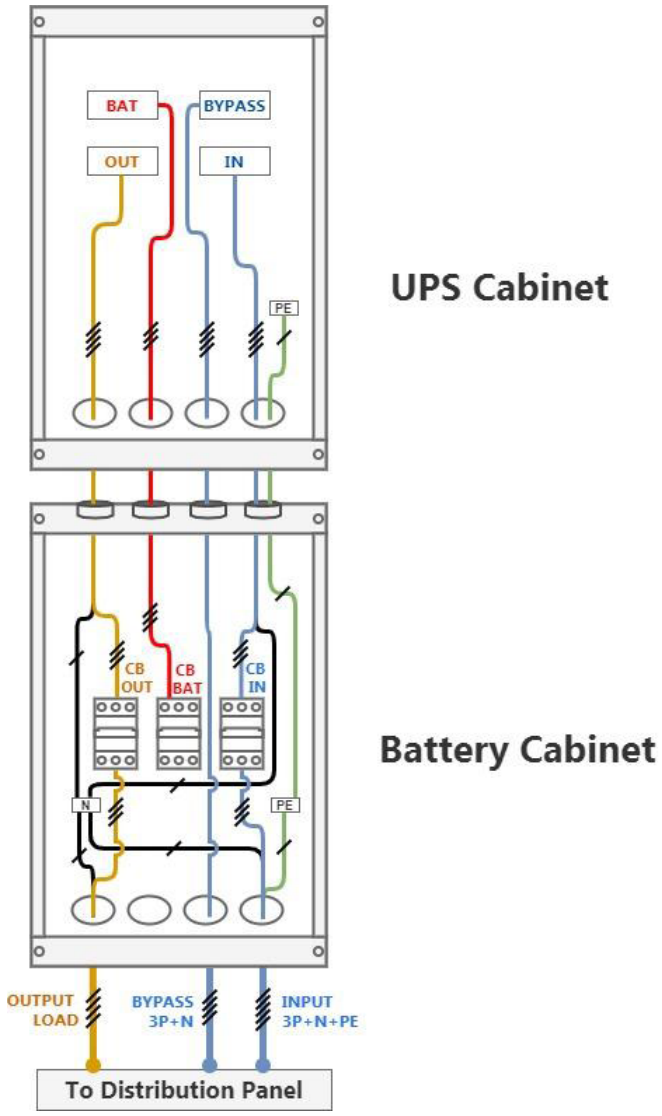


Fig 3-23: Tower-Stacked Installation Wiring for Dual-Feed with Optional Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

⚠	**NOTICE** Fig 3-24 to 3-27 is the wiring diagram only for one SM-20kVA UPS cabinet with two BCT3L9N125 cabinets. The 40K system with 2 battery cabinets is recommended to be installed all side-by-side. OR if a Tower Stack to have the 2nd battery cabinet installed next to the tower stack

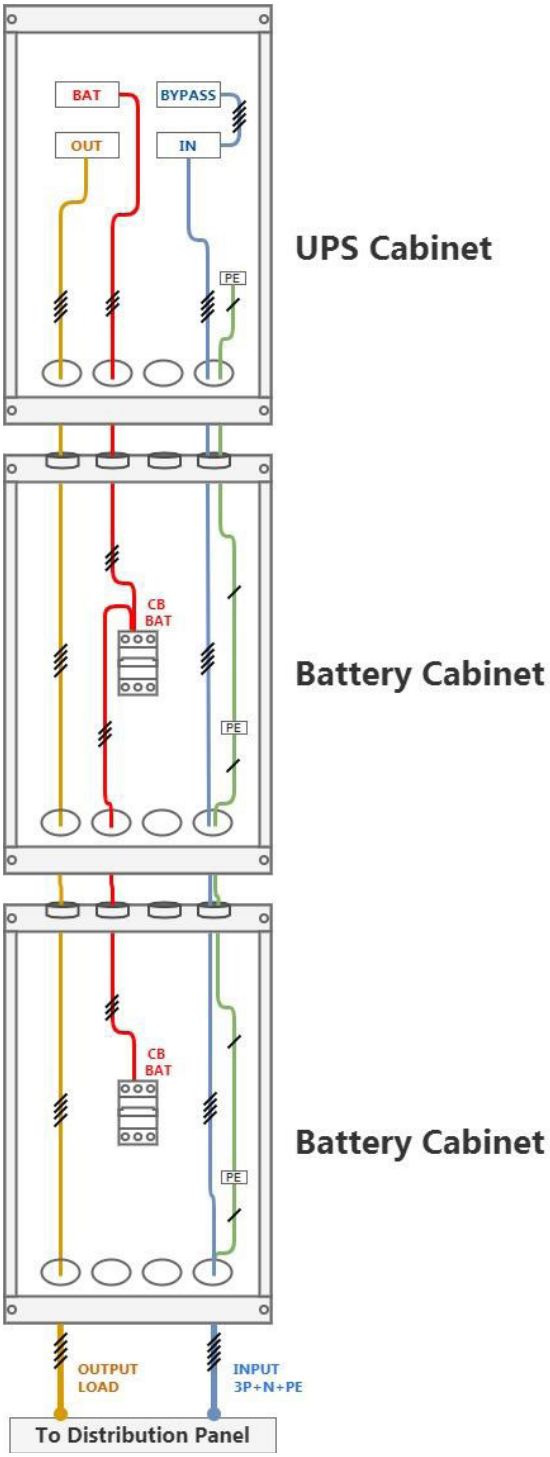


Fig 3-24: Tower-Stacked Installation Wiring for Single-Feed with Standard Configuration

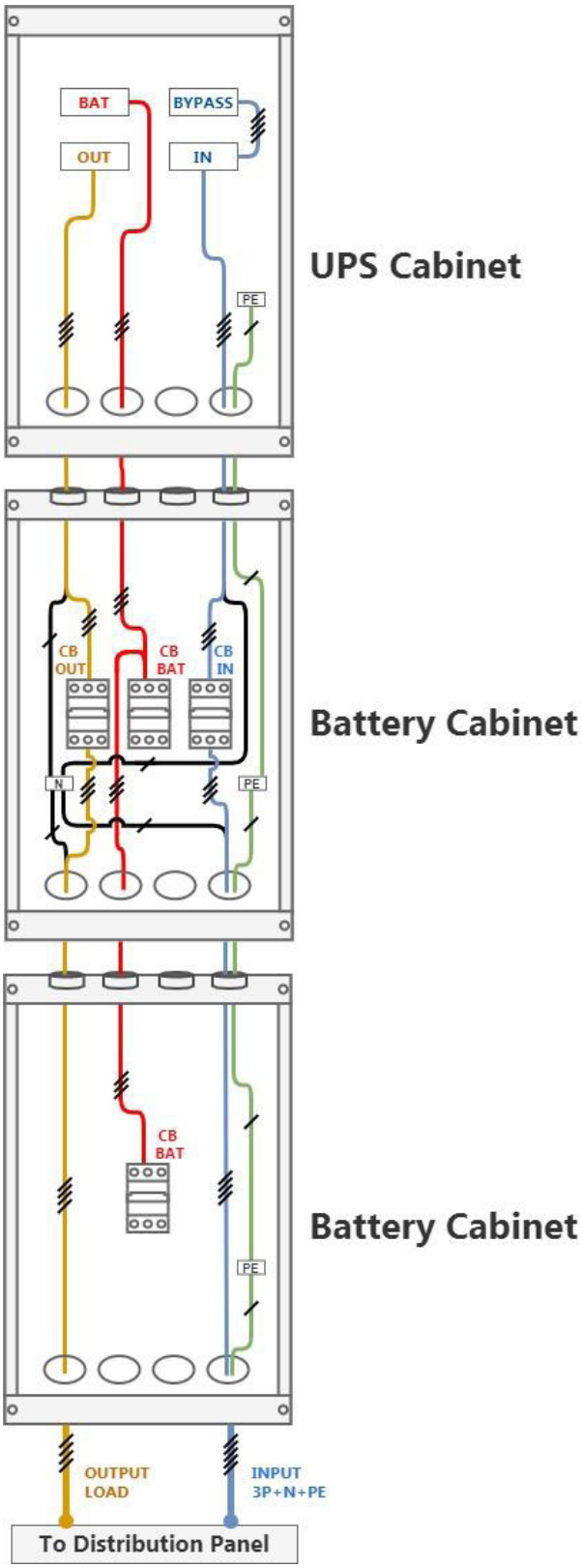


Fig 3-25: Tower-Stacked Installation Wiring for Single-Feed with Optional Configuration

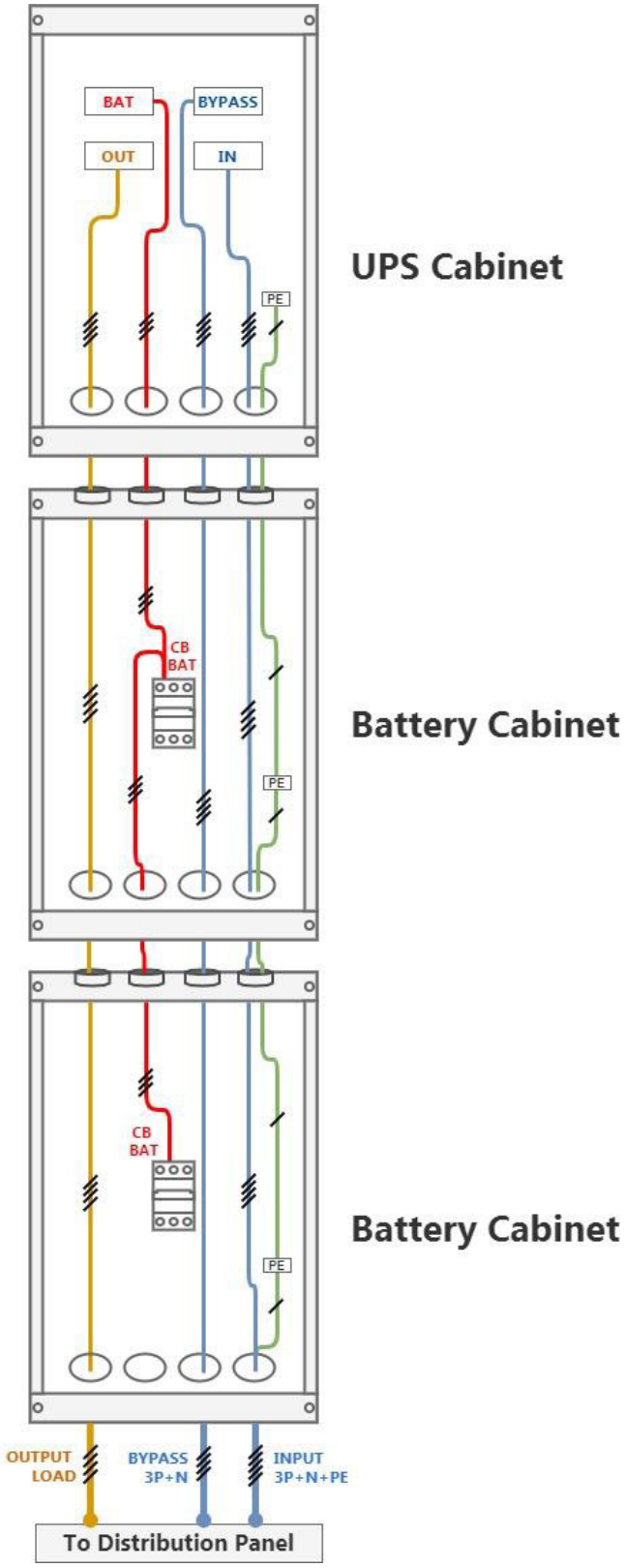


Fig 3-26 Tower-Stacked Installation Wiring for Dual-Feed Standard Configuration

CHAPTER 3 - CONFIGURATIONS AND WIRING DIAGRAMS

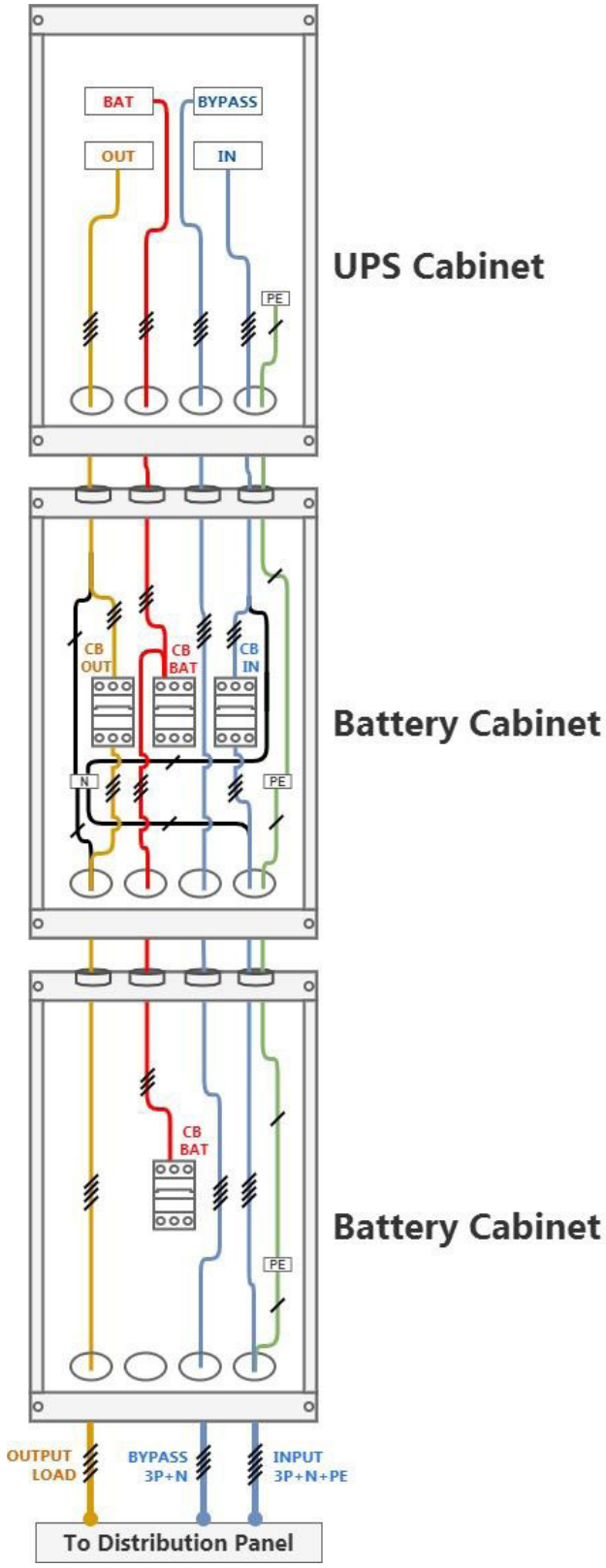


Fig 3-27 Tower-Stacked Installation Wiring for Dual-Feed Optional Configuration

CHAPTER 4 SYSTEM INSTALLATION

WARNING Installation should be performed only by a certified technician.

To allow for future power upgrades, install the UPS using wiring and external overcurrent protection breakers sized for fully rated UPS kW frame size instead of the de-rated kW ordered. Wiring for the maximum kW frame size will allow a full power rating upgrade without having to modify the site wiring infrastructure.

Refer to the following while installing the UPS cabinet and external battery cabinet:

- Refer Chapter 2 for cabinet dimensions, equipment weight and wiring data, and installation notes.
- Refer Chapter 3 for system configuration and power cable route.

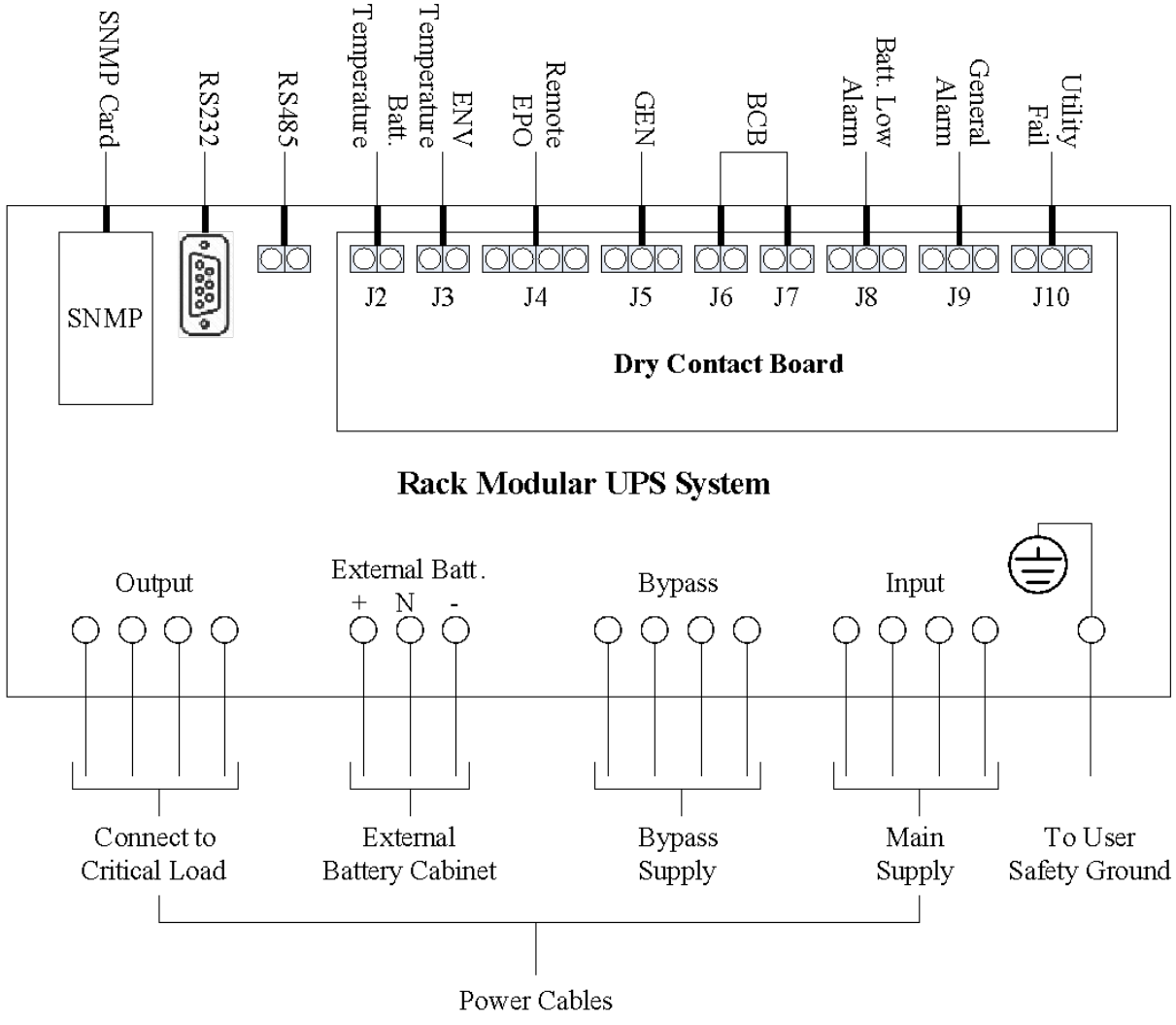


Fig 4-1: UPS Cabinet Connection

CHAPTER 4 SYSTEM INSTALLATION

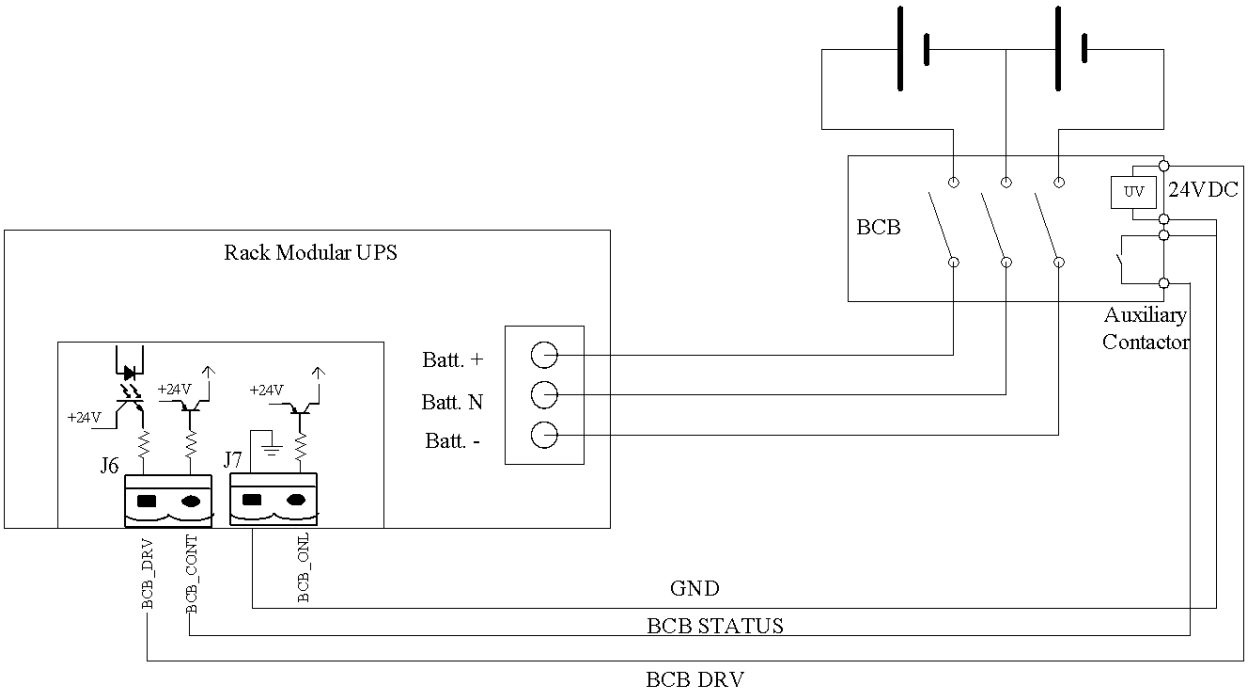


Fig 4-2: External Battery Connection

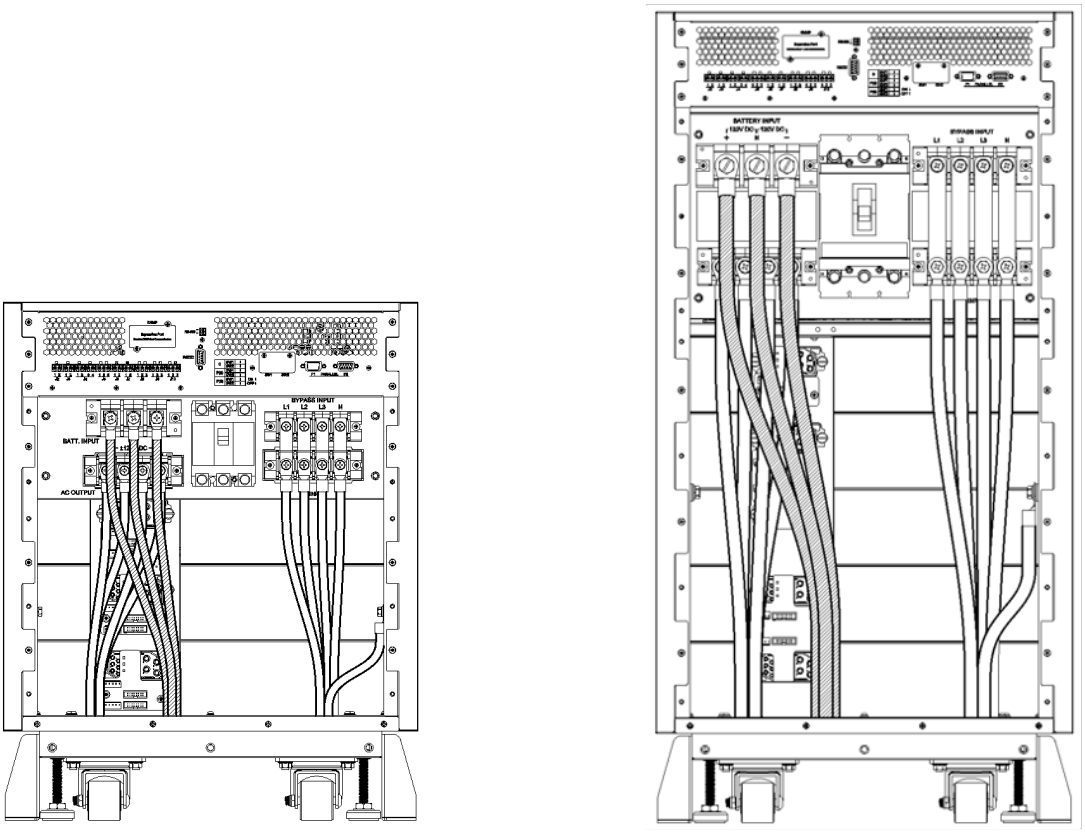
CHAPTER 4 SYSTEM INSTALLATION

4.1 Installing the UPS Cabinet Power Wiring

	**NOTICE** The operations described in this section must be performed by a certified technician. If you have any difficulties, do not hesitate to contact Tech Support.
	**WARNING** To allow for future power upgrades, install the UPS using wiring and external overcurrent protection breakers sized for fully rated UPS kW frame size instead of the de-rated kW ordered. Wiring for the maximum kW frame size will allow a full power rating upgrade without having to modify the site wiring infrastructure.

Power cables can enter the 3-phase UPS cabinet both from bottom and back. Connect cables through ellipse hole to prevent foreign material entering the cabinet. Use circular entry protector if ellipse hole is not big enough. If connecting cables through bottom entry, first remove the cover and install a rubber cable protector in the bottom entry hole.

CHAPTER 4 SYSTEM INSTALLATION



(a) SM-20kVA

(b) SM-40kVA UPS

Fig 4-3: Power Cable Entry

⚠	**NOTICE** Fix cables in SM-20kVA UPS as Fig.4-3(a) to ensure best ventilation. Secure cables in SM-40kVA UPS as Fig.4-3(b) to ensure best ventilation. Enter through reserved entry cover if ellipse holes are not big enough, and block the remaining space to protect UPS.

CHAPTER 4 SYSTEM INSTALLATION

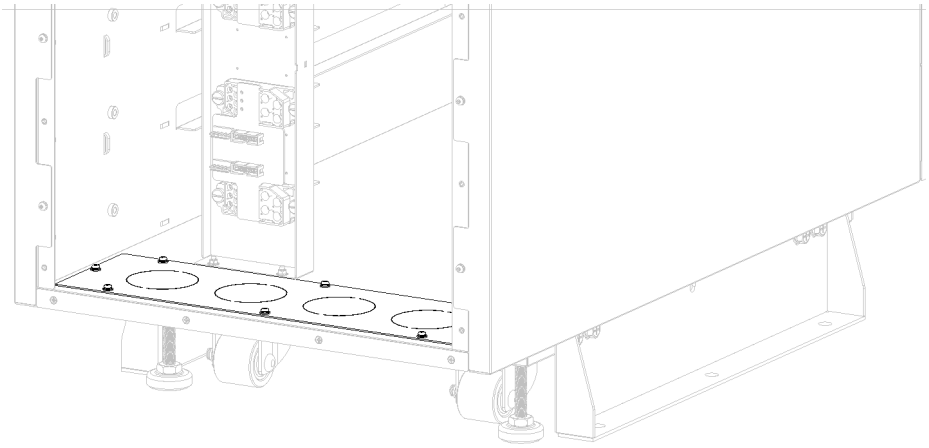
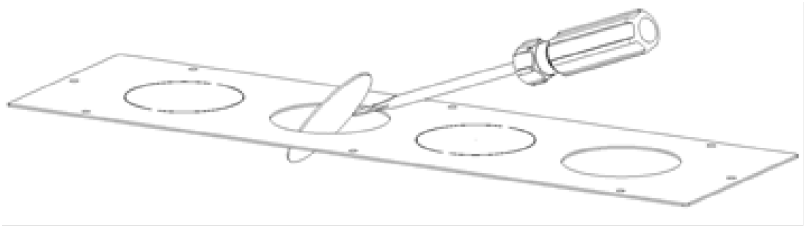


Fig 4-4: Remove the Bottom Cable Entry Bracket



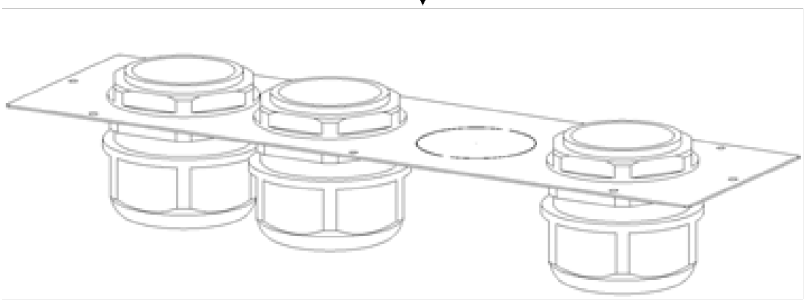


Fig 4-5: Install Cable Glade on Bracket

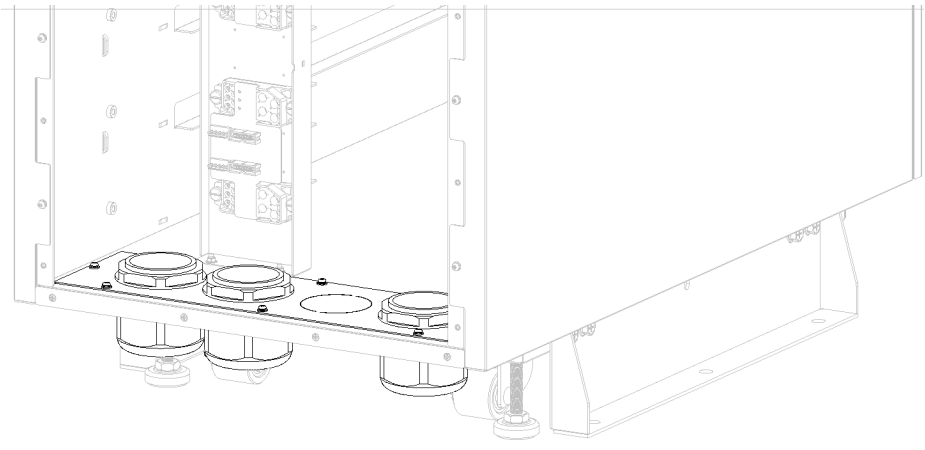


Fig 4-6: Install the Cable Entry Bracket on Bottom

Fig 4-7: Bottom Cable Entry

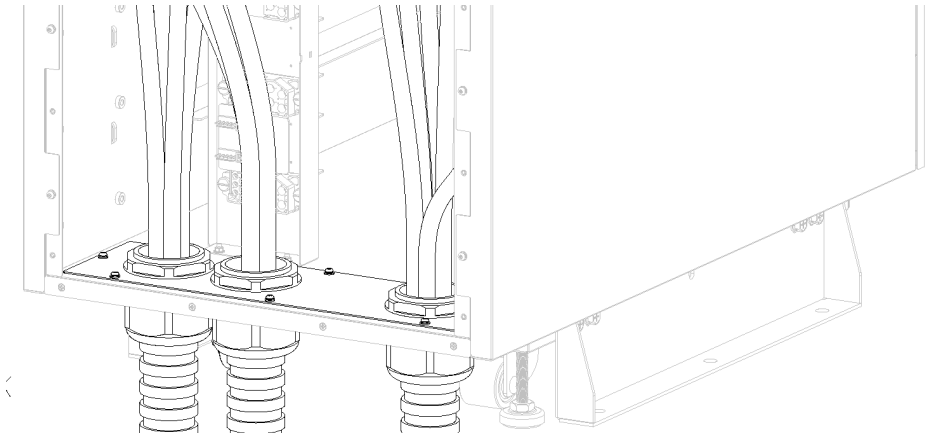


Fig 4-8: Remove the Bottom Cable Entry Bracket

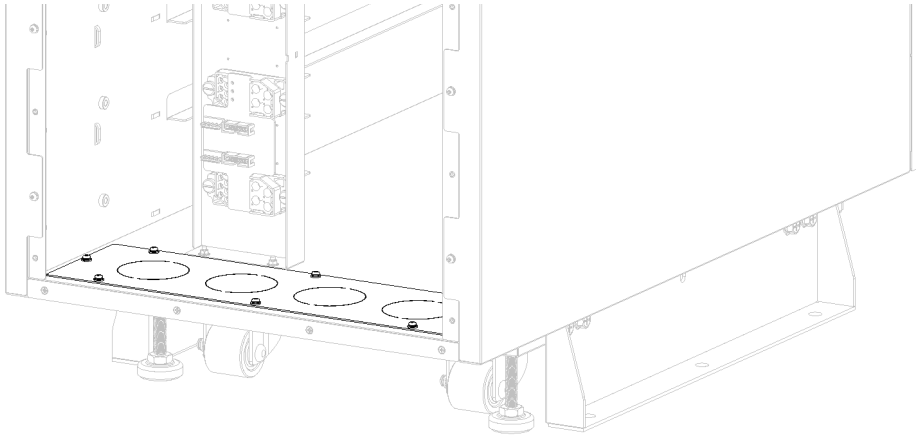


Fig 4-9: Back Cable Entry Box

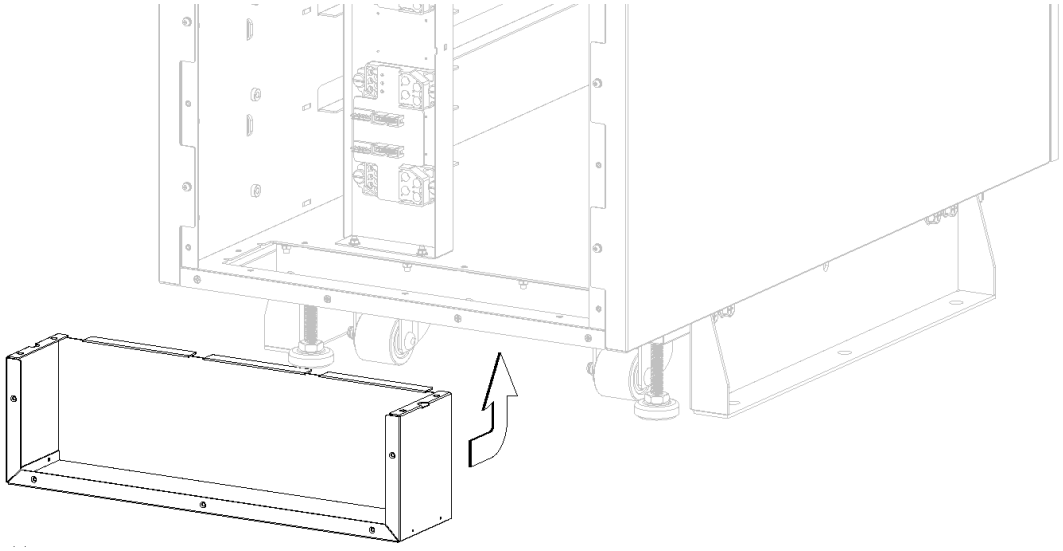


Fig 4-10: Install Back Cable Entry Box

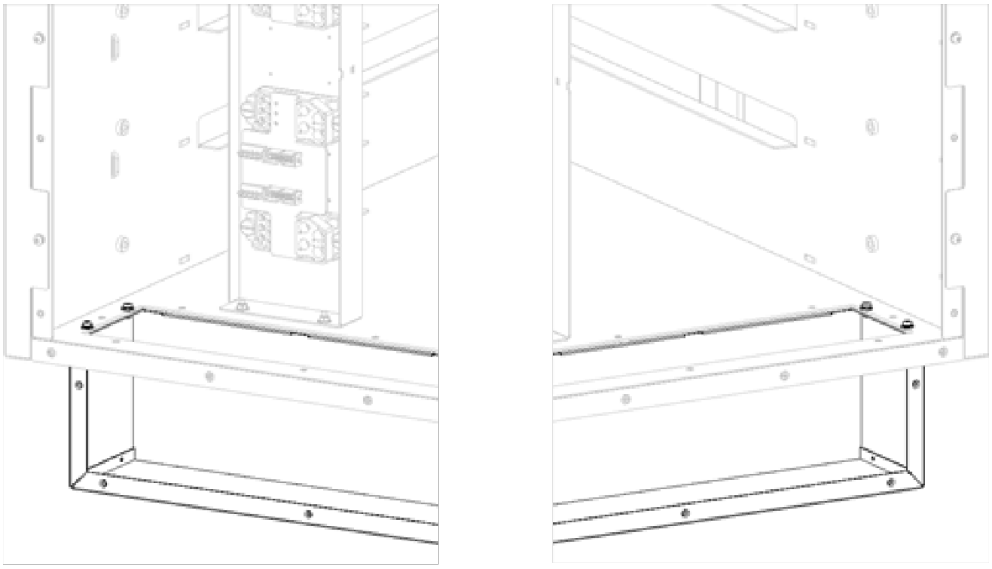


Fig 4-11: Install Cable Glade on Bracket

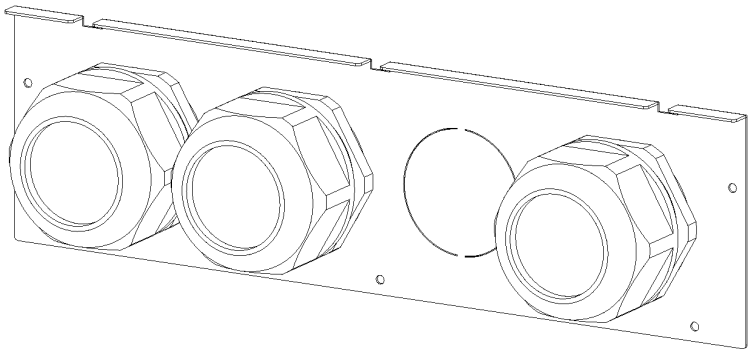
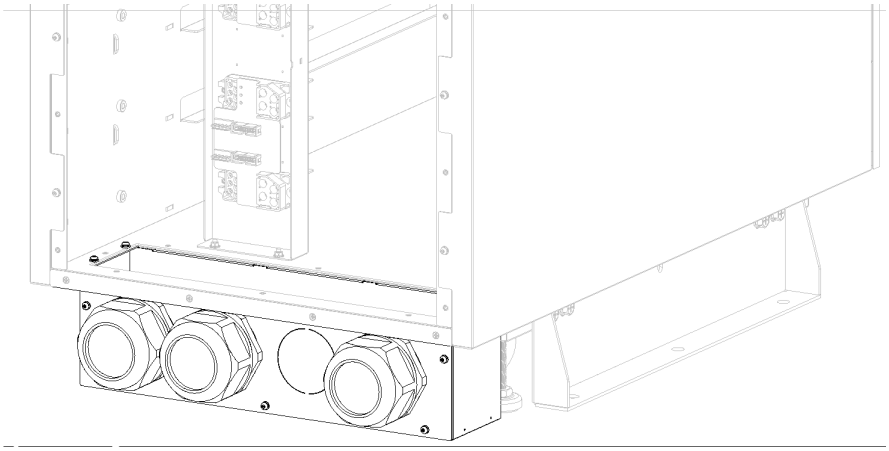


Fig 4-12: Install Cable Glade Bracket on Back Cable Entry Box



CHAPTER 4 SYSTEM INSTALLATION

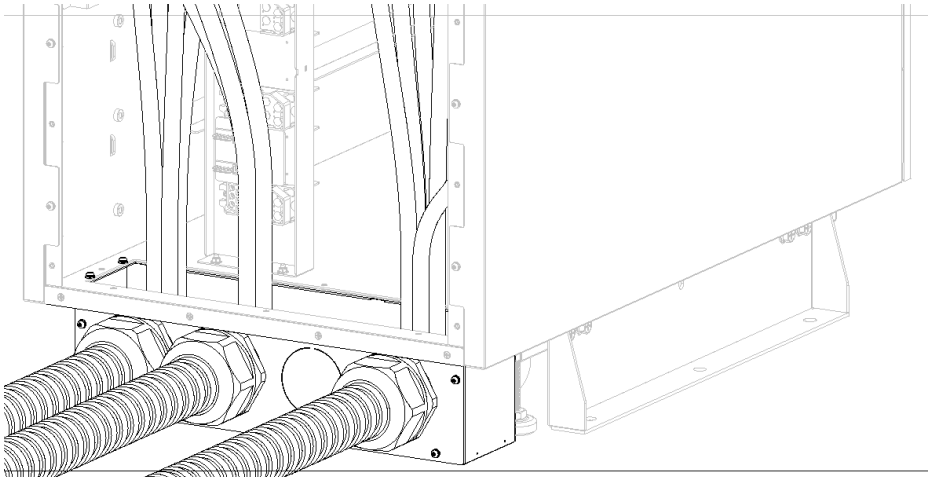


Fig 4-13: Back Cable Entry

- The back cable entry box is provided in accessory box.
- SM-20kVA UPS cable glade size is M40.
- SM-40kVA UPS cable glade size is M63.

After the equipment has been finally positioned and secured, refer to Chapter 2 Installation Plan and Unpacking and Chapter 3 System Configurations and Wiring Diagrams to connect the power cables as described in the following procedures:

1. Verify that all the external input distribution switches of the UPS system are completely opened. Attach necessary warning signs to these switches to prevent unauthorized operation.
2. Use a Phillips screwdriver to remove back cover panel of the UPS cabinet, and then the power connections are visible. See Fig 4-14 and Fig 4-15.
3. Connect the protective earth and any necessary grounding cables to the PE connection. The cabinet for the UPS must be connected to the user's ground connection.

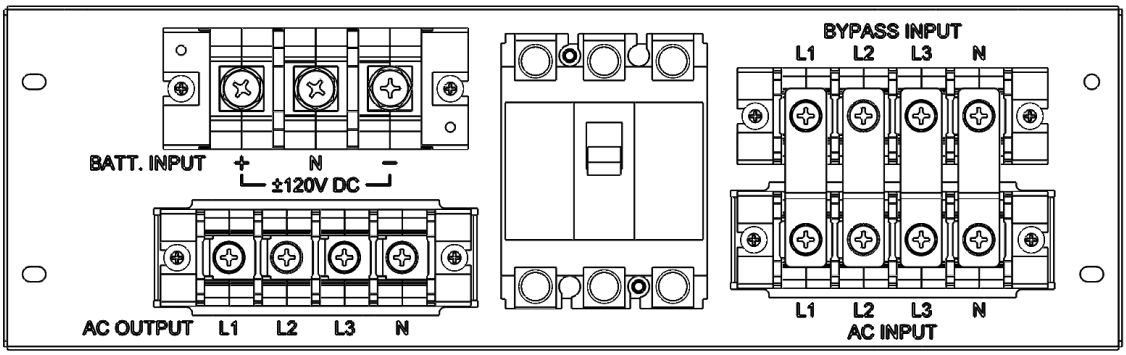


Fig 4-14: SM-20kVA UPS Power Connection Block

CHAPTER 4 SYSTEM INSTALLATION

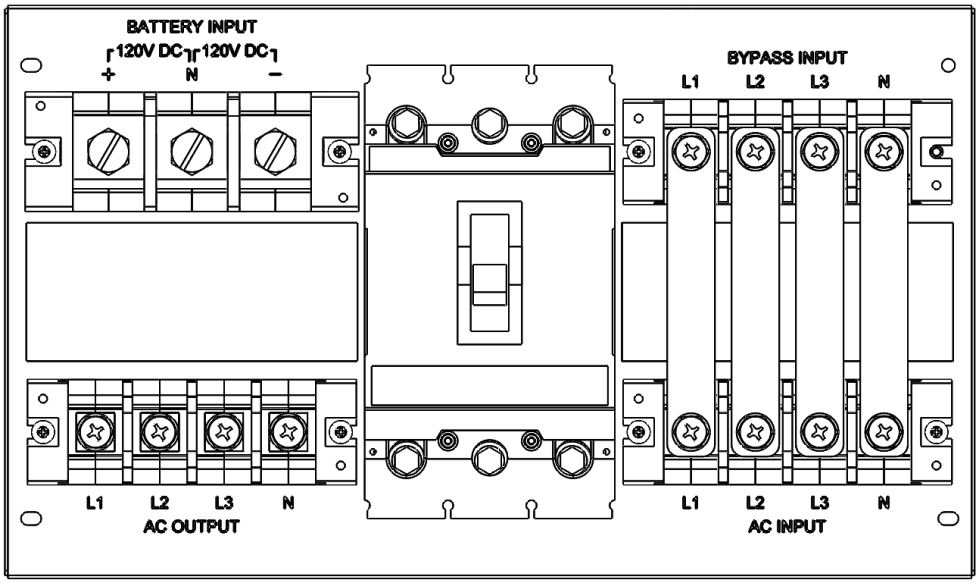


Fig 4-15: SM-40kVA UPS Power Connection Block

⚠	**NOTICE** The grounding cable and neutral cable must be connected in accordance with local and national codes practice.

4. Make power connections for incoming cables according to the procedures below, depending on the type of installation:

4.1.1 Single-Feed Connections

For single-feed application, connect the AC input supply cables to the UPS AC input connections (AC INPUT L1-L2-L3-N). Refer to Fig. 4-16.

⚠	**NOTICE** Ensure correct phase rotation for Single-Feed application ensure that the bus-bars between Bypass and Rectifier inputs are connected.

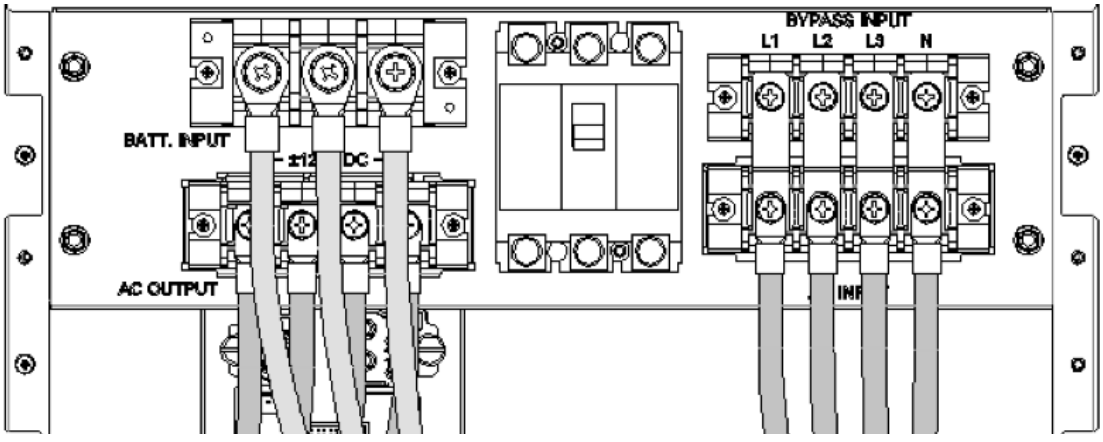


Fig 4-16: SM-20kVA UPS Single-Feed Power Wiring

4.1.2 Dual-Feed Connections (option)

If a Dual-Feed configuration is used, connect the AC input supply cables to the rectifier AC input connections (AC INPUT L1-L2-L3-N) and the AC bypass input supply cables to the bypass input connections (BYPASS INPUT L1-L2-L3-N). Refer to Fig. 4-17 and Fig 4-18.

⚠	**NOTICE** Ensure correct phase rotation for Dual-Feed application ensure that the bus-bars between Bypass and Rectifier inputs are removed. The neutral line of bypass input must be connected to that of the rectifier input.

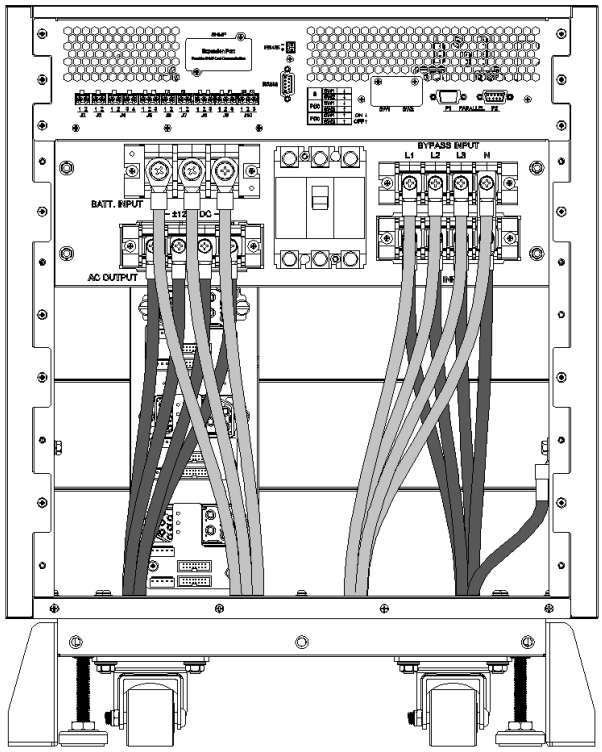


Fig 4-17: SM-20kVA UPS Dual-Feed Power Cable Entry

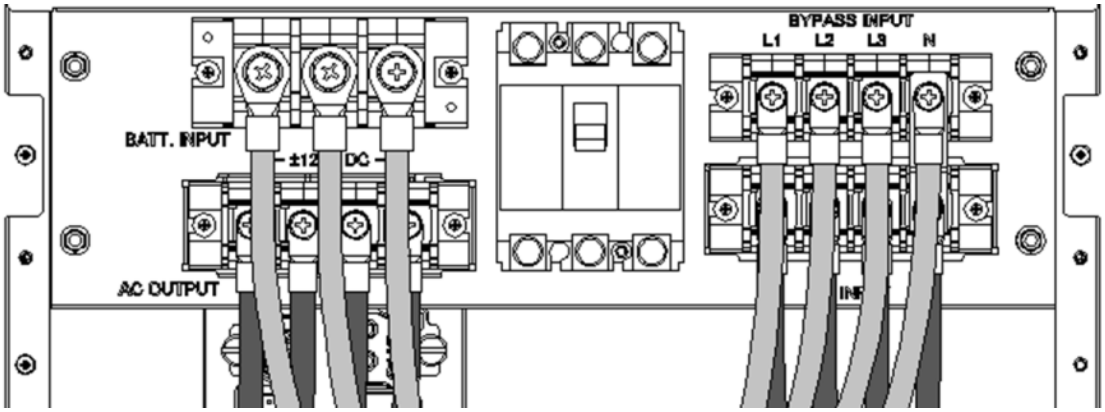


Fig 4-18: SM-20kVA UPS Dual-Feed Power Wiring

CHAPTER 4 SYSTEM INSTALLATION

4.1.3 Frequency Converter Mode (option)

If the frequency converter configuration is used, connect the AC input supply cables to the rectifier AC input connections (AC INPUT L1-L2-L3-N). No need to connect the bypass input cables to bypass input connections (BYPASS INPUT L1-L2-L3-N). Refer to Fig. 4-19.

⚠	**NOTICE** Ensure correct phase rotation for the frequency converter operation mode, ensure that the bus-bars between Bypass and Rectifier inputs are removed.

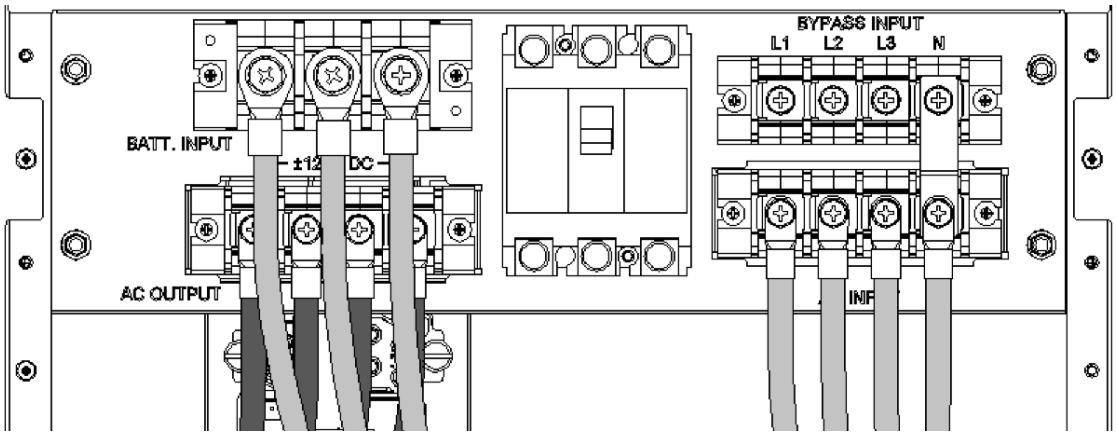


Fig 4-19: SM-20kVA UPS Frequency Converter Mode Power Wiring

4.1.4 Output System Connections

Connect the system output cables to the UPS AC output connections (AC OUTPUT L1-L2-L3-N). Refer to Fig 4-14 and Fig 4-15.

	**NOTICE** Ensure correct phase rotation.
	**WARNING** If the load equipment will not be ready to accept power on the arrival of the commissioning engineer, then ensure that the system output cables are safely isolated at their ends.

5. Re-install all the protective covers and back cover panel.

CHAPTER 4 SYSTEM INSTALLATION

4.2 Installing the External Battery Cabinet Power Wirings

⚠	**NOTICE** Refer to Chapter 2 Installation Plan and Unpacking and Chapter 3 System Configurations and Wiring Diagrams to connect the power cables.
⚠	**WARNING** To allow for future power upgrades, install the UPS using wiring and external overcurrent protection breakers sized for fully rated UPS kW frame size instead of the de-rated kW ordered. Wiring for the maximum kW frame size will allow a full power rating upgrade without having to modify the site wiring infrastructure.

The external battery cabinet has three power cable entry brackets. The cable entry bracket in top back of battery cabinet is used for tower-stacked and rack-mounted installation. The cable entry bracket in back of battery cabinet is used for side-by-side installation. The cable entry bracket in bottom of battery cabinet and cable entry box are used for input cable and output cable with optional breakers.

⚠	**NOTICE** • The application and installation of bottom cable entry box and bottom cable entry bracket are same as UPS cabinet. Refer to chapter section 4.1. • Wiring can be installed using conduit between cabinets. • The installation procedures for BCT3L9N125 and BCT6L9N225 are identical.

4.2.1 Without Optional Breakers

To install power wiring to connections:

1. Install conduit between the UPS cabinet and the battery cabinet. If installing a second battery cabinet, install conduit between the first and second battery cabinets.
2. Removed the back cover panel on battery cabinet.
3. Route the battery cables (positive, neutral, negative, and ground) through the conduit on the back of battery cabinet (2nd from left up 2” cabinet wiring knockout plate) to the BATTERY OUTPUT and ground connection blocks on battery cabinet. See Fig 4-20 for power wiring access information and connection locations. If installing a second battery cabinet, see Fig 4-21 for the power wiring. See chapter 2 and 3 for power wiring requirements.
4. Connect the positive, neutral and negative power wiring to the (+), (N) and (-) connections of BATTERY OUTPUT on battery cabinet. Connect the ground wiring to the ground connection on battery cabinet. See Fig 4-22.

5. Route the other end of the battery cables (positive, neutral, negative, and ground) to the UPS cabinet external battery input and ground connections.
6. Use a Phillips screwdriver to secure the back cover panel.

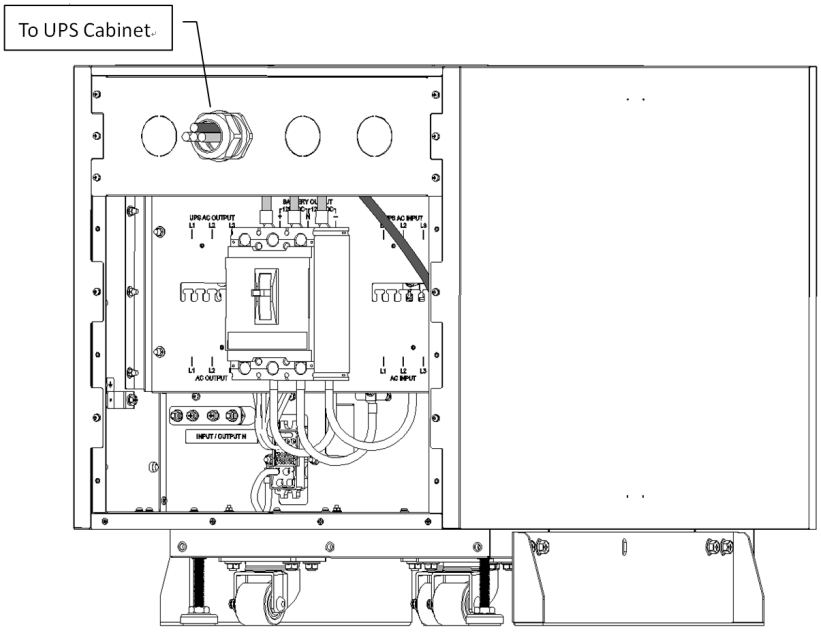


Fig 4-20: BCT3L9N125 Power Wiring without Optional Breakers

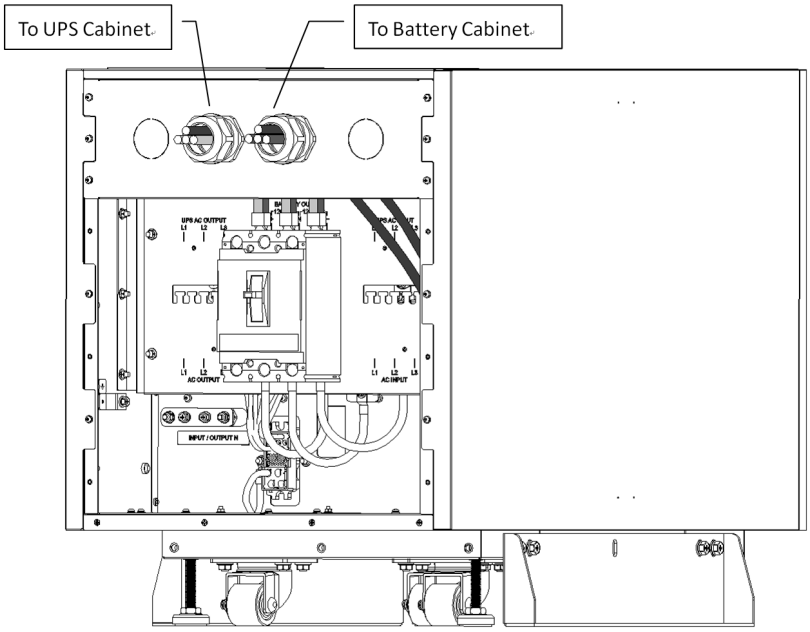


Fig 4-21: With Second BCT3L9N125 Power Wiring without Optional Breakers

CHAPTER 4 SYSTEM INSTALLATION

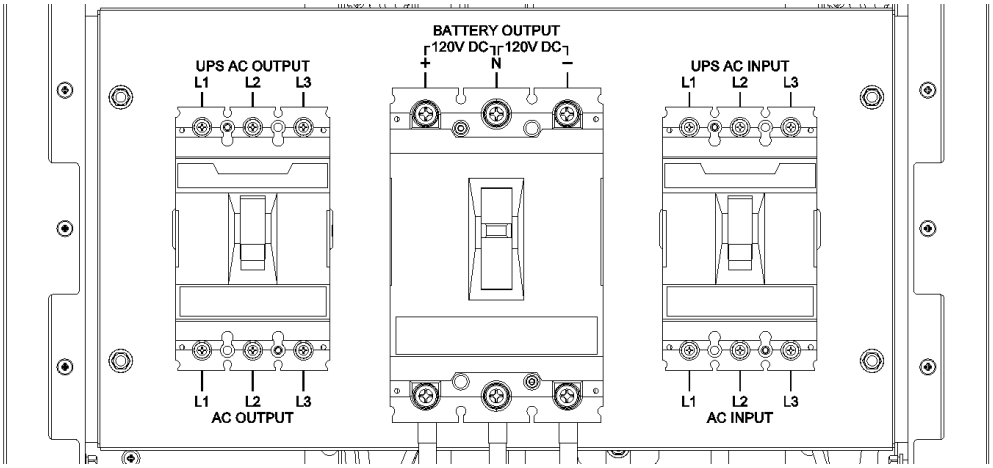


Fig 4-22: Battery Power Connections Detail – BCT3L9N125

4.2.2 With Optional Breakers

To install power wiring to connections:

1. Install three conduits between the UPS cabinet and the battery cabinet. If installing a second battery cabinet, install conduit between the first and second battery cabinets (3rd from left up 2” cabinet wiring knockout plate). See Fig 4-24 and Fig 4-25
2. Remove the back cover panel on battery cabinet.
3. Connect the neutral connections of input and output on UPS cabinet to neutral bar on battery cabinet, connect the cable between UPS cabinet ground bar and battery cabinet ground bar, secure the neutral cables of input and output cables to neutral bar on battery cabinet and secure the outer ground cable to battery cabinet ground bar. (See Figure 4-23)
4. Route the UPS output cables (L1, L2, L3 and N) through the conduit on the back of battery cabinet (1st from left up 2” cabinet wiring knockout plate). See Fig 4-24 for power wiring access information and connection locations. See chapter 2 and 3 for power wiring requirements.
5. Route the battery cables (positive, neutral and negative) through the conduit on the back of battery cabinet (2nd from left up 2” cabinet wiring knockout plate) to the BATTERY OUTPUT. See Fig 4-24 for power wiring access information and connection locations. See chapter 2 and 3 for power wiring requirements.
6. Route the UPS input cables (L1, L2, L3, N and PE) through the conduit on the back of battery cabinet (1st from right up 2” cabinet wiring knockout plate). See Fig 4-24 for power wiring access information and connection locations. See chapter 2 and 3 for power wiring requirements.
7. Connect the UPS output cables (L1, L2, L3 and N) to the UPS AC OUTPUT (Output breaker up side connections and Neutral bus bar) on battery cabinet. See Fig 4-23 and Fig 4-24.
8. Connect the positive, neutral and negative power wiring to the (+), (N) and (-) connections of BATTERY OUTPUT on battery cabinet. Connect the ground wiring to the ground connection on battery cabinet. See Fig 4-23 and Fig 4-24.

9. Connect the UPS input cables (L1, L2, L3, N and PE) to the UPS AC INPUT (Input breaker up side connections, Neutral bus bar and PE connection) on battery cabinet. See Fig 4-23 and Fig 4-24.
10. Install two conduits between power distribution panel and the battery cabinet.
11. Route the output cables (L1, L2, L3 and N) through the conduit on the back of battery cabinet (1st from left down 2" cabinet wiring knockout plate). See Fig 4-23 and Fig 4-24 for power wiring access information and connection locations. See chapter 2 and 3 for power wiring requirements.
12. Route the input cables (L1, L2, L3, N and PE) through the conduit on the back of battery cabinet (1st from right down 2" cabinet wiring knockout plate). See Fig 4-23 and Fig 4-24 for power wiring access information and connection locations. See chapter 2 and 3 for power wiring requirements.
13. Connect the output cables (L1, L2, L3 and N) to the AC OUTPUT (Output breaker down side connections and Neutral bus bar) on battery cabinet. See Fig 4-23 and Fig 4-24.
14. Connect the input cables (L1, L2, L3, N and PE) to the AC INPUT (Input breaker down side connections, Neutral bus bar and PE terminal) on battery cabinet. See Fig 4-23 and Fig 4-24.
15. Use a Phillips screwdriver to secure the back cover panel.

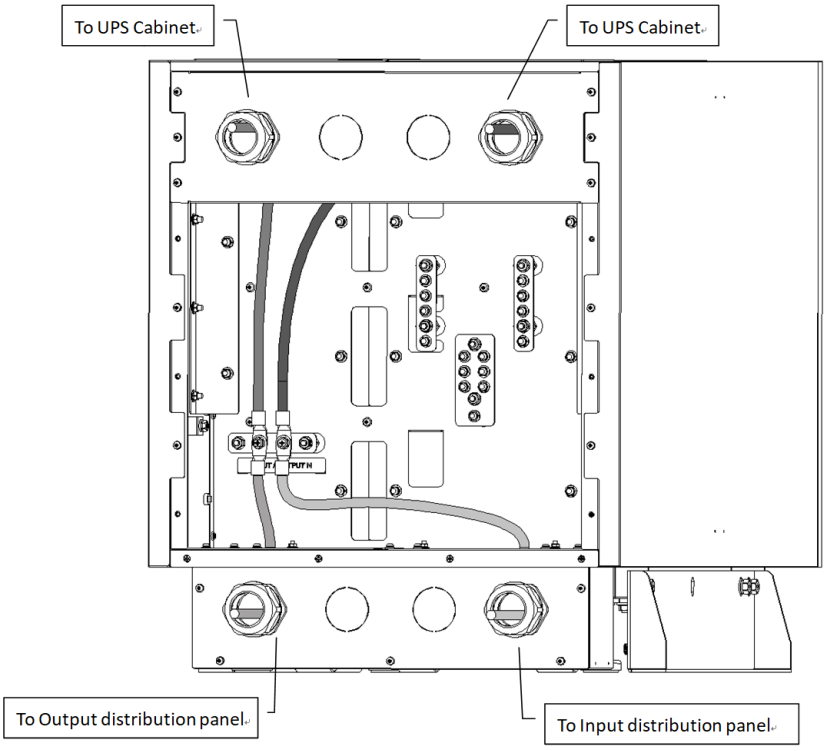


Fig 4-23: Securing the Neutral Cables

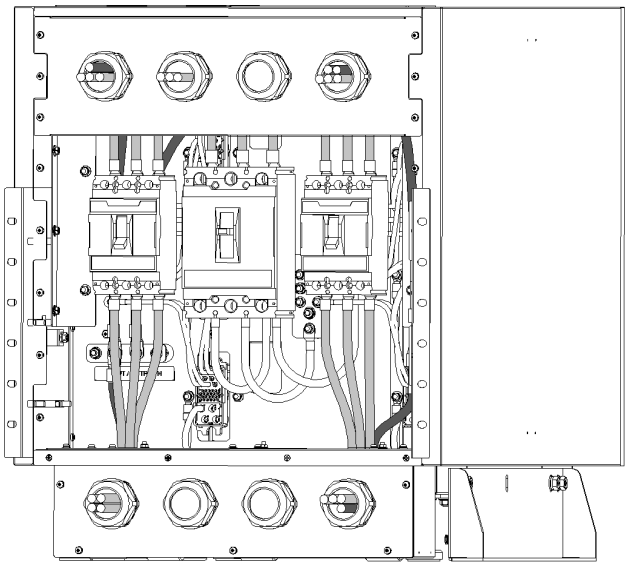


Fig 4-24: BCT3L9N125 with Optional Breakers Power Wiring

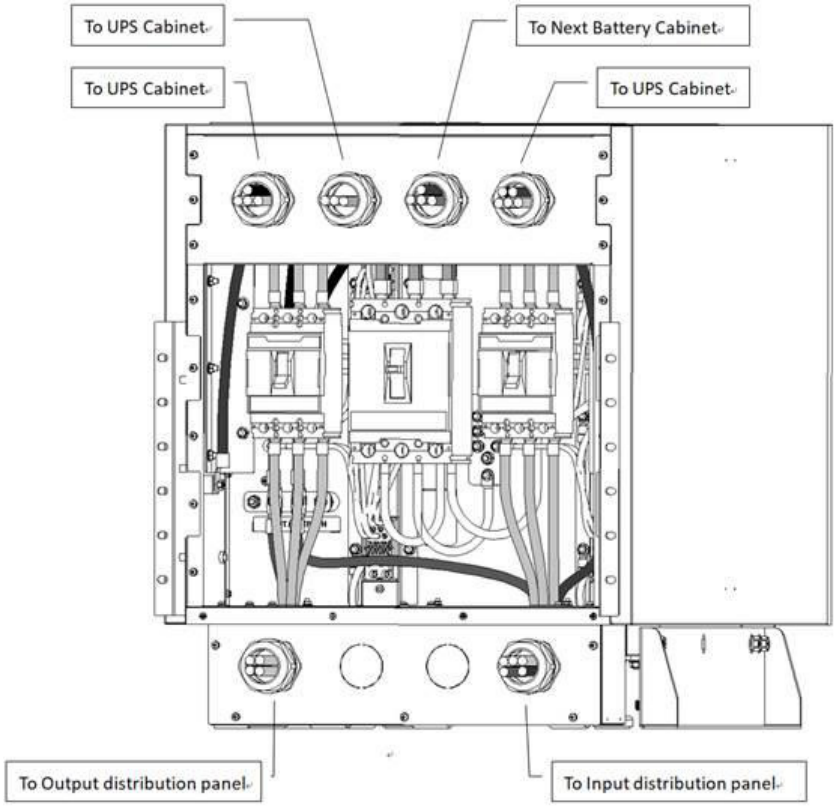


Fig 4-25: BCT3L9N125 with Optional Breakers Power Wiring (with Second Battery Cabinet)

CHAPTER 4 SYSTEM INSTALLATION

4.3 Installing the Power Modules

The number and possible installation positions of the Power Modules may vary according to the chosen factory configuration. Please install the power modules from bottom to top, so as to avoid cabinet toppling due to high gravity center.

Installation procedures of power modules:

When installing power modules always work from the lower available space upwards to prevent from raising the center of gravity. The default setting from the bottom space upwards is NO.1 to NO.3 (SM-20kVA UPS cabinet), NO.1 to NO.5 (SM-40kVA UPS cabinet).

⚠	**NOTICE** The procedure of SM-20kVA UPS cabinet is shown. The SM-40kVA UPS cabinet is the identical.

1. Replace perimeter metal strips on the two side of front panel. Loosen screws through holes on metal strips, pull metal strips to the outside then take away the strips as Fig 4-26.
2. Using a Phillips screwdriver to remove the front cover of power module. (See Fig 4-26)
3. Insert the module in the installation position, and push it into the cabinet as Fig 4-27.
4. Secure the module to the cabinet through the fixing holes on both sides of the front panel of the module.
5. Loosen the upper and bottom 4 screws and fix two side perimeter metal strips to cover the screws on front side following Fig 4-28 and Fig 4-29.

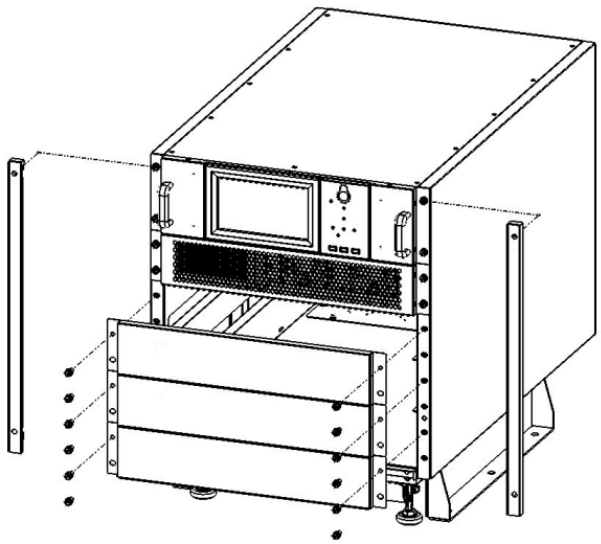


Fig 4-26: Remove Side Perimeter Metal Strips and Power Module Cover

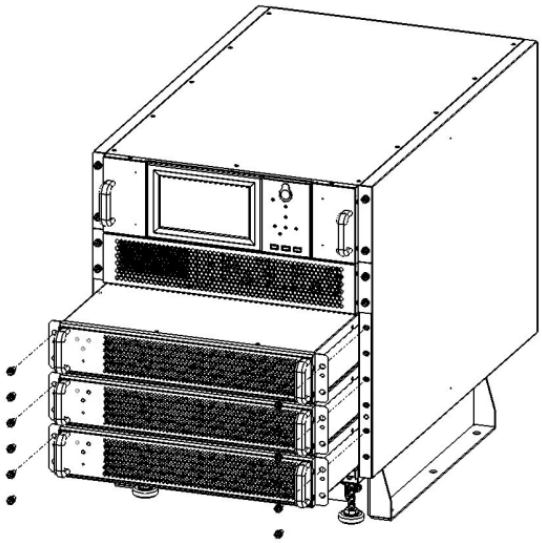


Fig 4-27: Insert Power Module

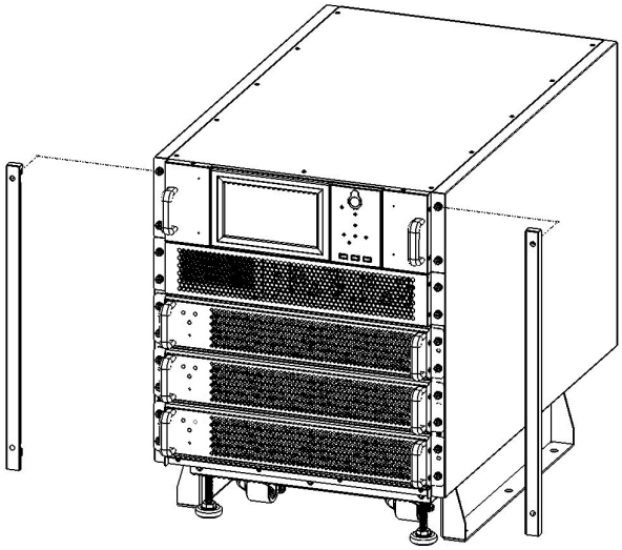


Fig 4-28: Replace the Perimeter Metal Strips

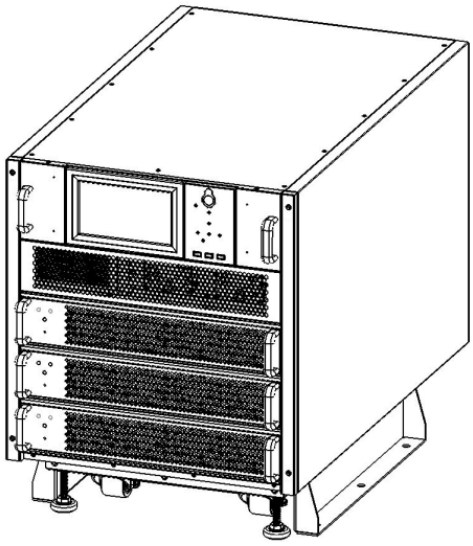


Fig 4-29: Fasten the Strips

CHAPTER 4 SYSTEM INSTALLATION

4.4 Installing the Battery Module

⚠	**WARNING** Battery module is heavy. (34kg) Use two people to lift the battery module.
⚠	**NOTICE** The procedure of BCT6L9N225 is shown. The BCT3L9N125 is the identical.

To Install battery module into cabinet:

1. Loosen four bolts securing the front perimeter strip brackets to the cabinet and remove the front perimeter strip brackets. (See Fig 4-30)

⚠	**NOTICE** One front cover bracket is for one layer with two battery modules. Per layer is for one battery string.
⚠	**WARNING** Battery module is heavy. (34kg) When installing the battery module, always position it from the lower available space to prevent the center of gravity from being too high

2. Remove two bolts securing the lower front cover bracket to the cabinet. (See Fig 4-31)
3. Remove two bolts securing the front inner panel bracket to the cabinet. (See Fig 4-31)
4. For other layer battery module, repeat Step 2 and 3.

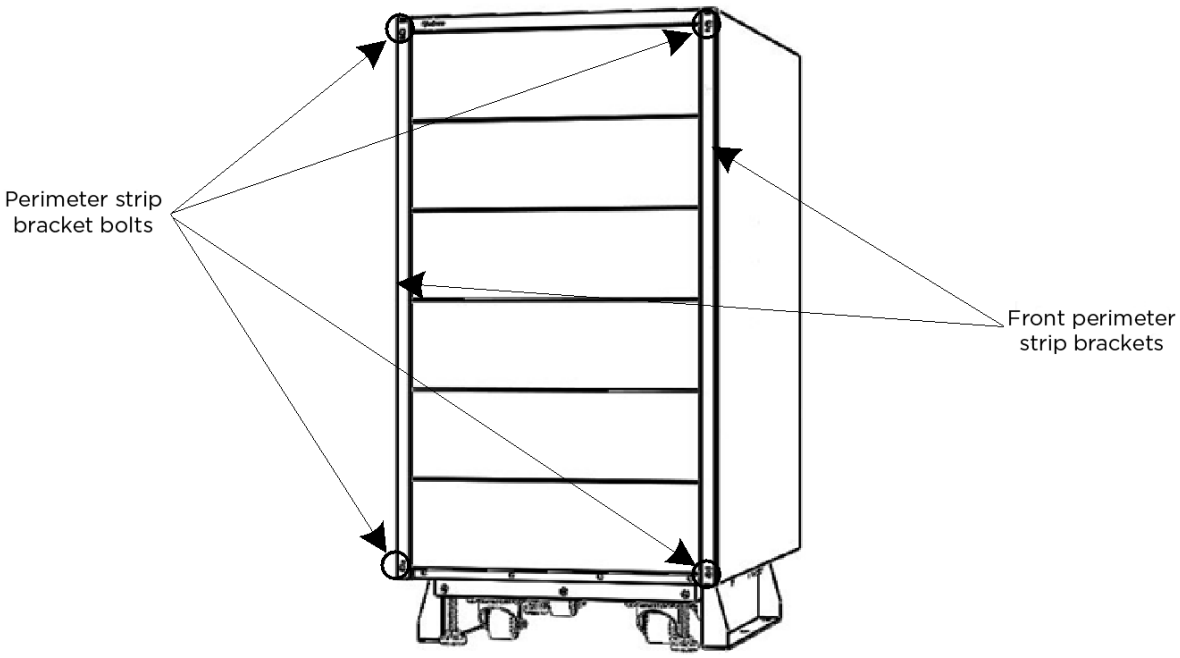


Fig 4-30: Removing the Front Perimeter Strip Brackets – BCT6L9N225

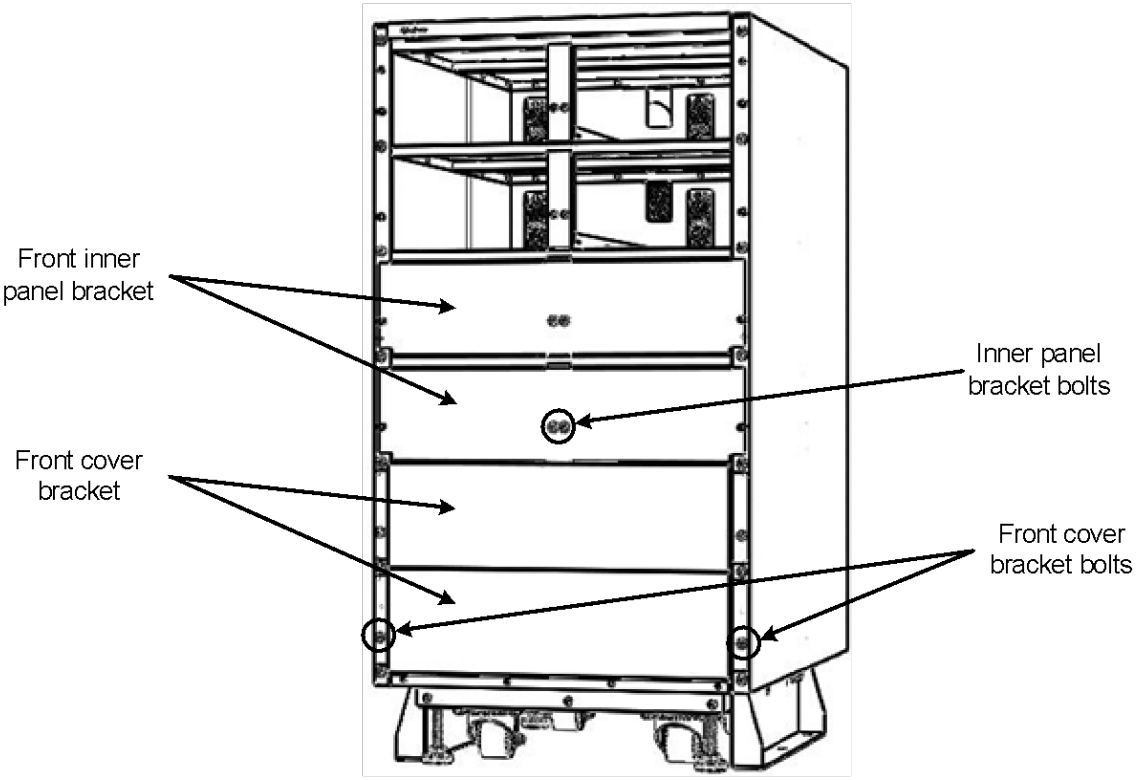


Fig 4-31: Removing the Front Panel Brackets – BCT6L9N225

⚠	**WARNING** Before placing the battery module into the bay of cabinet, use multi-meter to measure the battery voltage from the connector in back of battery module. Make sure the battery voltage of battery module is within the normal range. (See Fig 4-32)

5. Place the battery module into the bay of cabinet. (See Fig 4-33)
6. Secure the two battery modules in cabinet bays by two bolts per layer. (See Fig 4-33)
7. Secure the front cover bracket back to cabinet by two bolts.
8. For other layer, repeat Step 6 and 7.

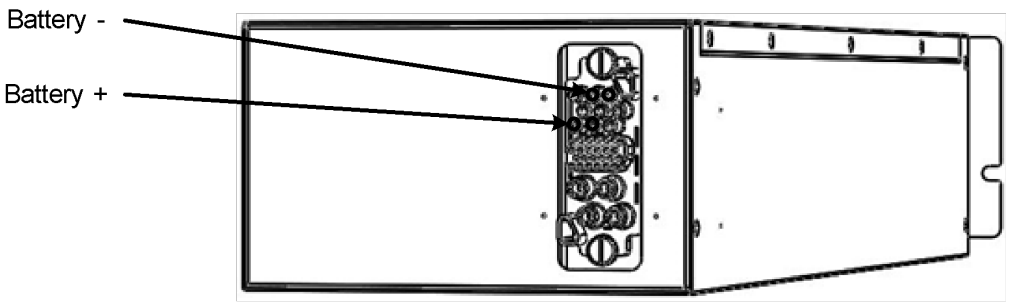


Fig 4-32: Battery Module Connector

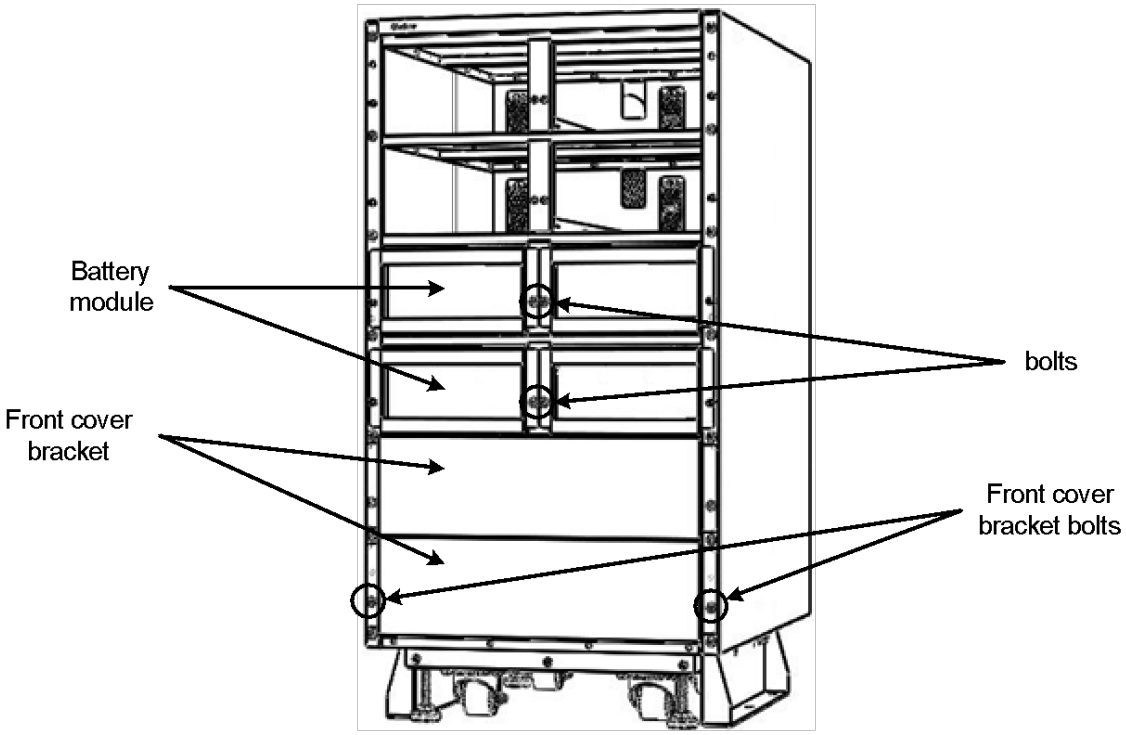


Fig 4-33: Secure the Front Cover Brackets – BCT6L9N225

CHAPTER 4 SYSTEM INSTALLATION

4.5 Installing the Tower-Stacked UPS and Battery Cabinets

⚠	**WARNING** The UPS cabinet, Bypass module, and Power module are all very heavy. Use at least two people to life each piece of equipment.

4.5.1 Tower-Stacked with Two Cabinets

⚠	**NOTICE** The stacking configuration procedures are the same for SM-20kVA and BCT3L9N125 as well as the SM-40kVA and BCT6L9N225.

To stack UPS cabinet on top of the battery cabinet:

1. Loosen bolts securing the front perimeter strip brackets to the cabinet and remove the front perimeter strip brackets. (See Figure 4-34)
2. Remove the bolts securing the front cover bracket to the cabinet and remove the front cover brackets. (See Figure 4-35)
3. Remove the bolts securing the front inner panel bracket to the cabinet and remove the front inner panel brackets. (See Figure 4-36)
4. Remove the bolts securing the side panels to cabinet and remove the side panels. (See Figure 4-37 and Figure 4-38)
5. Remove these bolts securing the top conduit plate to cabinet and remove the top conduit panel. (See Figure 4-39)

   Repeat steps 1, 2 and 4 to remove front perimeter strip brackets, front cover brackets and side panels of UPS cabinet.

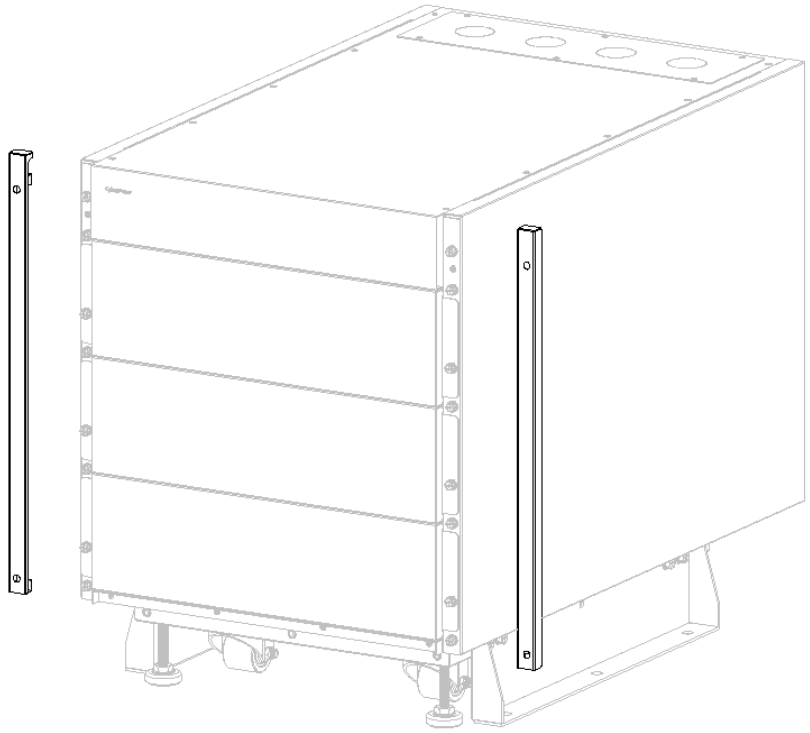


Fig 4-34: Removing the Battery Cabinet Front Perimeter Strip Brackets

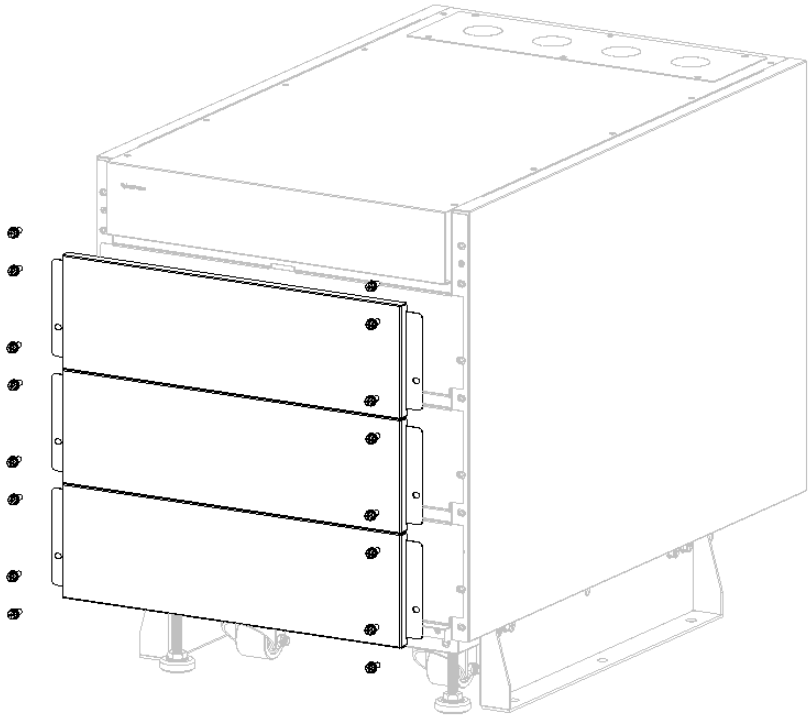
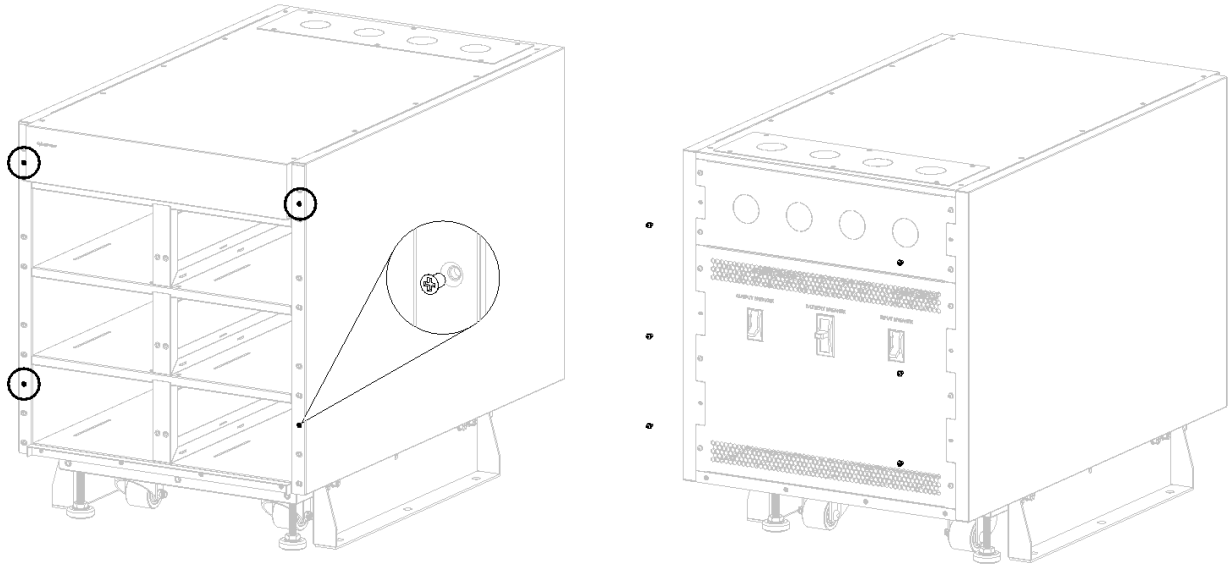


Fig 4-35: Removing the Battery Cabinet Front Cover Brackets

Fig 4-36: Removing Battery Cabinet the Front Panel Brackets



Front View

Back View

Fig 4-37: Removing the Bolts of Battery Cabinet Side Panels

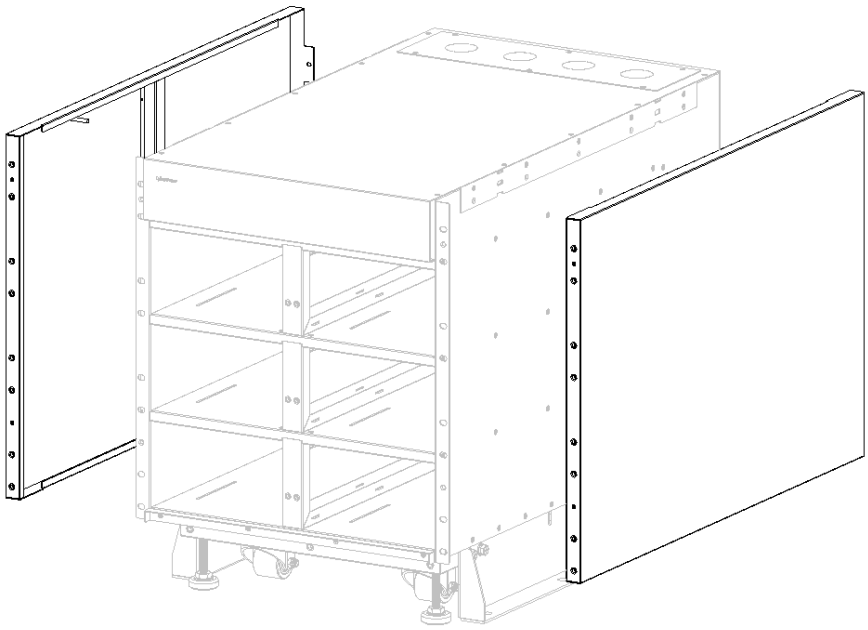


Fig 4-38: Removing the Battery Cabinet Side Panels, Front View

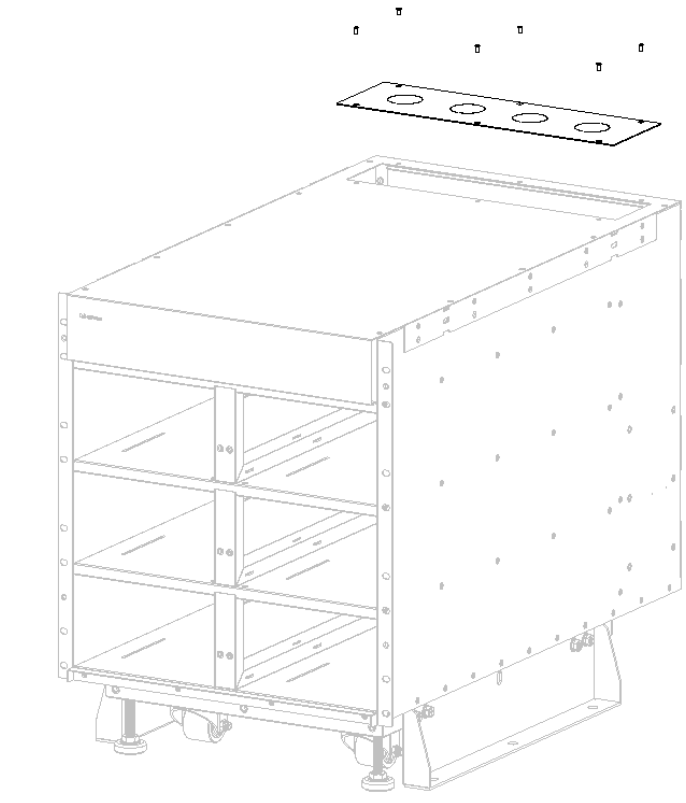


Fig 4-39: Removing the Battery Cabinet Top Conduit Plate, Front View

6. Removed out the Bypass module of UPS cabinet. (See Figure 4-40)
7. The UPS cabinet is tilted vertically (front). (See Figure 4-41)
8. Removed these bolts securing the caster holder bracket to UPS cabinet and removed the caster holder brackets. (See Figure 4-42)

⚠	**NOTICE** Place protective material on the floor before setting up the UPS cabinet.

9. Remove the bolts securing the floor mounted bracket to UPS cabinet and remove the floor mounted brackets. (See Figure 4-43)
10. Stack the UPS cabinet on top of the battery cabinet. (See Figure 4-44)
11. Remove the bolts of both sides is shown in Figure 4-45 and remove the side straps.
12. Secure the side straps between UPS cabinet and battery cabinet. (See Figure 4-46)
13. Remove the bolts securing the back cover panel to both cabinets and remove the back cover panel of UPS and battery cabinets. (See Figure 4-47)

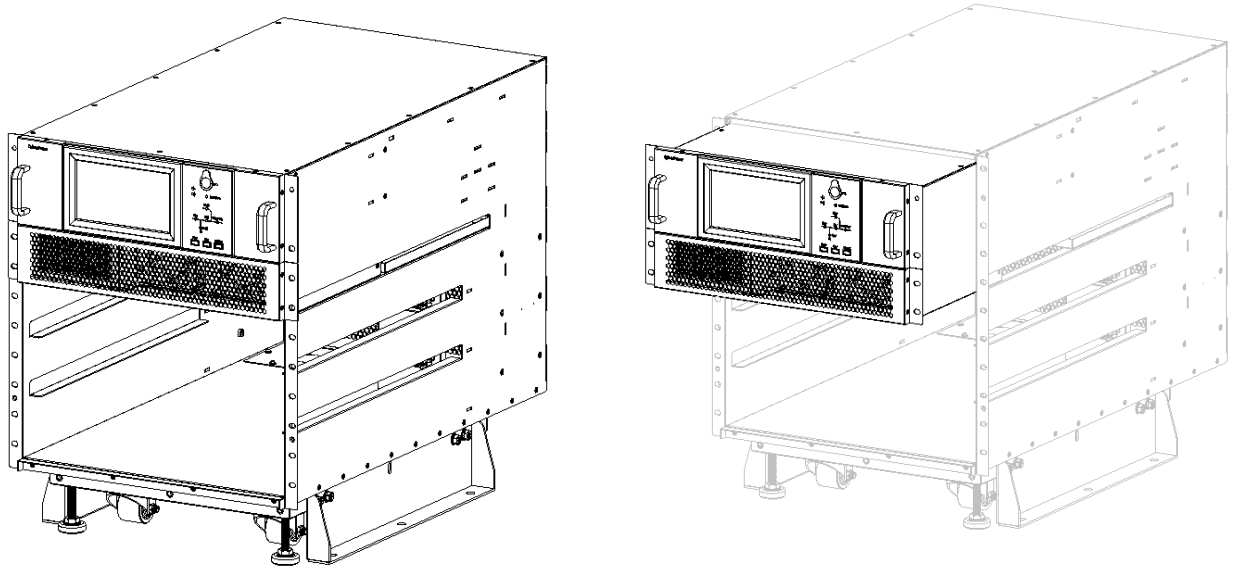


Fig 4-40: Remove the UPS Cabinet Bypass Module

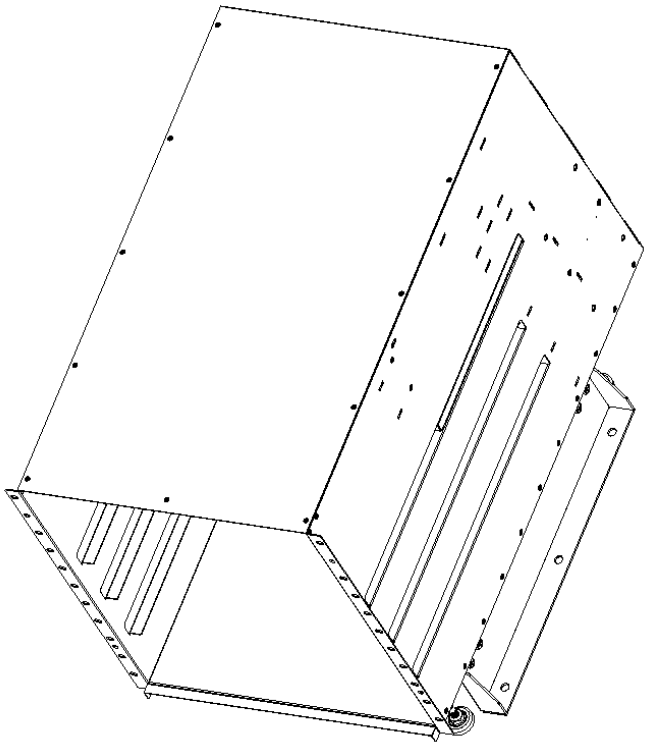


Fig 4-41: UPS Cabinet is Tilted Vertically

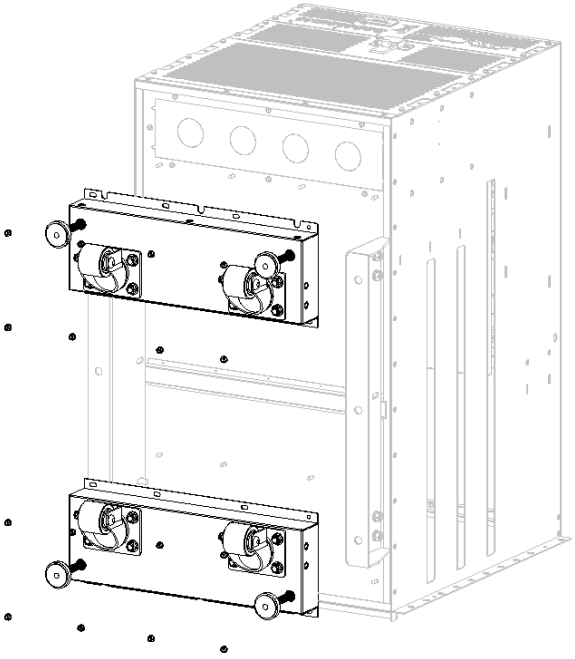
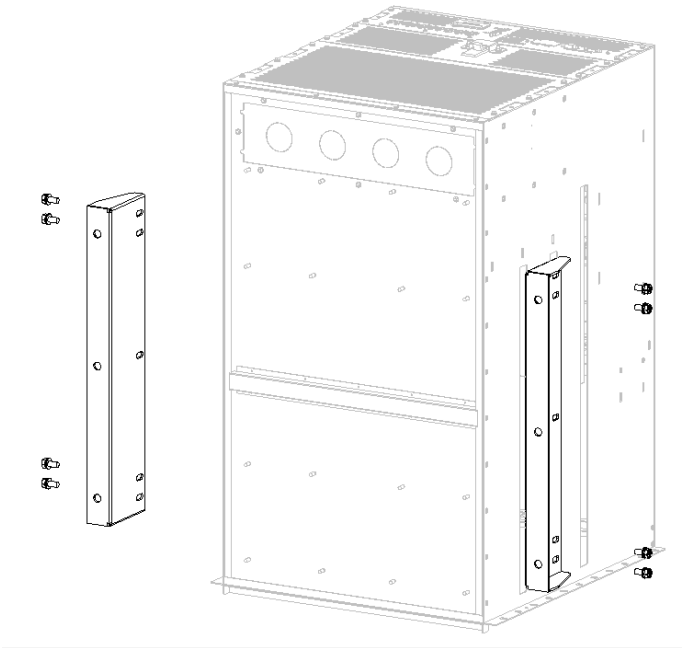


Fig 4-42: UPS Cabinet is Turned Over Vertically



Bottom side

Fig 4-43: Remove the UPS Cabinet Floor Mounted Brackets

CHAPTER 4 SYSTEM INSTALLATION

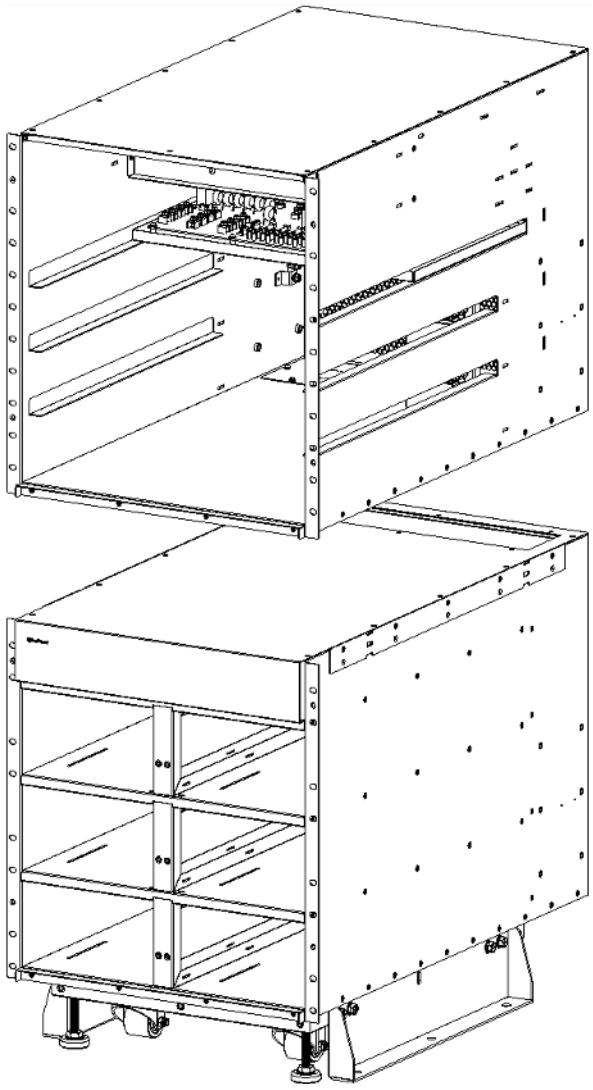


Fig 4-44: Stack the UPS Cabinet on Top of the Battery Cabinet

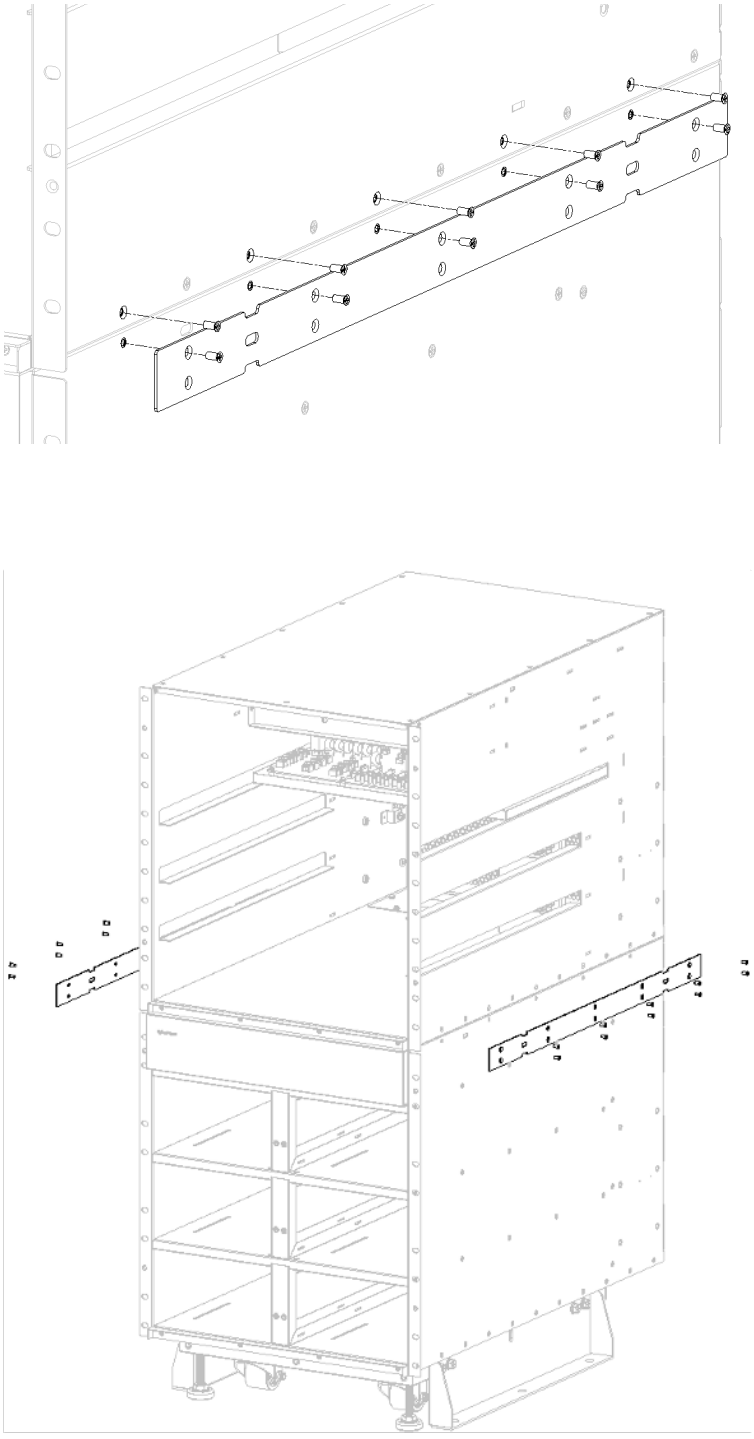


Fig 4-45: Remove the Bolts and Side Straps

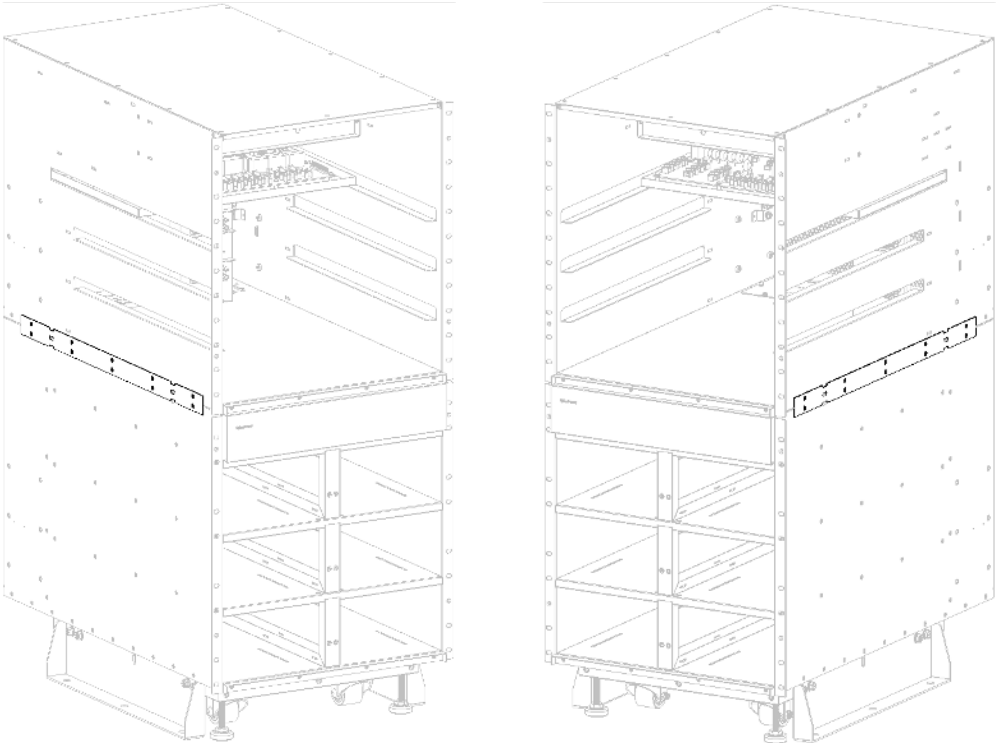


Fig 4-46: Secure the Side Straps Between UPS and Battery Cabinets

14. Remove the bolts securing the conduit plate to both cabinets and remove the conduit plates of UPS cabinet and battery cabinet. (See Figure 4-48)
15. Secure two cable glands to battery conduit plate for input and output cable entry and secure the conduit plate to battery cabinet. (See Figure 4-49)
16. Connect the neutral input and output connections on UPS cabinet to neutral bar on battery cabinet, connect the cable between UPS cabinet ground bar and battery cabinet ground bar, secure the neutral cables of input and output cables to neutral bar on battery cabinet and secure the outer ground cable to battery cabinet ground bar. (See Figure 4-50)
17. **(For without optional input breaker and output breaker on battery cabinet)** Connect the input cables (L1/L2/L3) and output cables (L1/L2/L3) to these connections on UPS cabinet. Use cable tie to secure these cables on battery cabinet. (See Figure 4-51)
18. **(For with optional input breaker and output breaker on battery cabinet)** Connect the input connections (L1/L2/L3) and output connections (L1/L2/L3) on UPS cabinet to upside connections of input breaker and output breaker on battery cabinet. Secure the input cables (L1/L2/L3) and output cables (L1/L2/L3) to downside connections of input breaker and output breaker. (See Figure 4-52)

19. Connect the battery connections on UPS cabinet to upside connections of battery breaker on battery cabinet. (See Figure 4-53)
20. Hang up the side panels of UPS and battery cabinets. (See Figure 4-54)
21. Secure the screws for side panels to UPS and battery cabinets. (See Figure 4-55)
22. Secure the screws for back cover panels to UPS and battery cabinets. (See Figure 4-56)
23. Place the Bypass module into UPS cabinet and secure the screws on UPS cabinet. (See Figure 4-57)

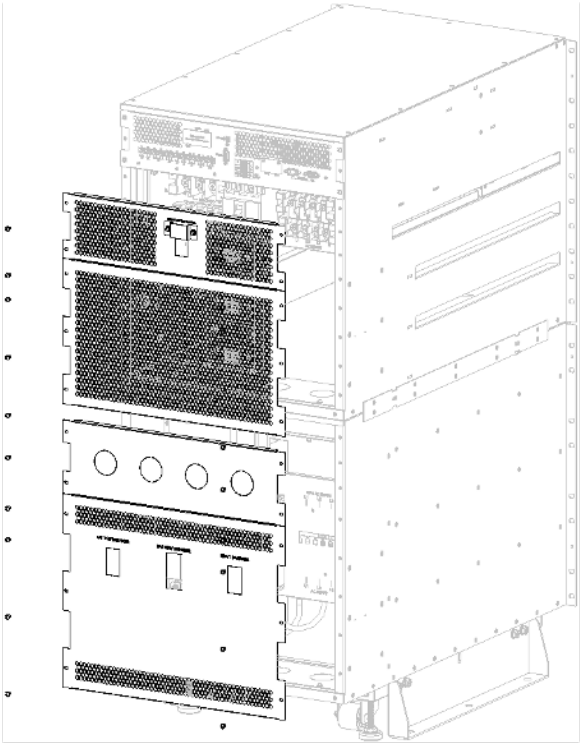


Fig 4-47: Remove the Back Cover Brackets of UPS and Battery Cabinets

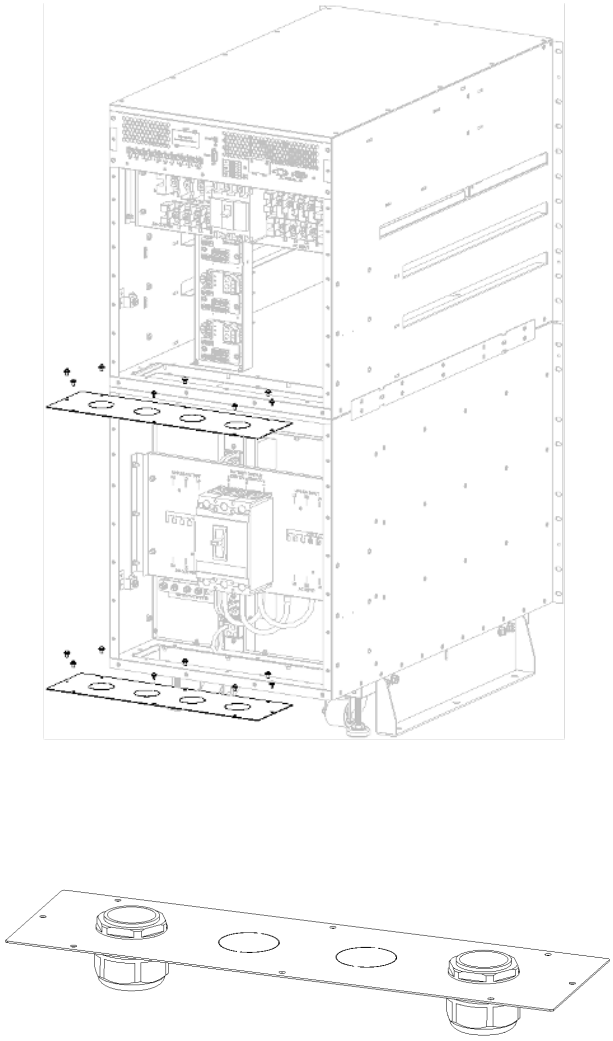


Fig 4-48: Remove the Conduit Plates of UPS and Battery Cabinets

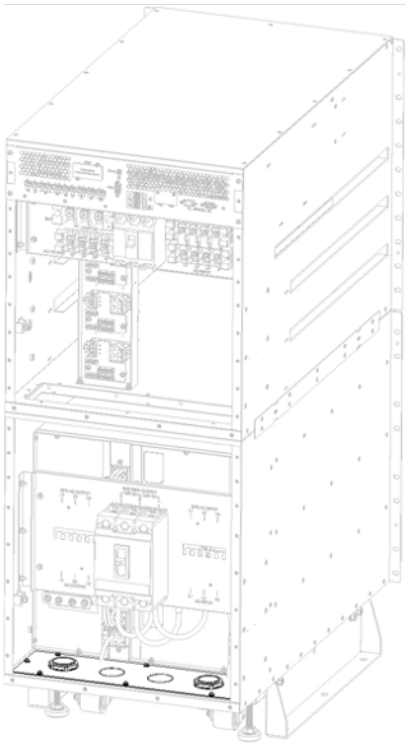


Fig 4-49: Secure the Cable Gland and Conduit Plates of Battery Cabinet

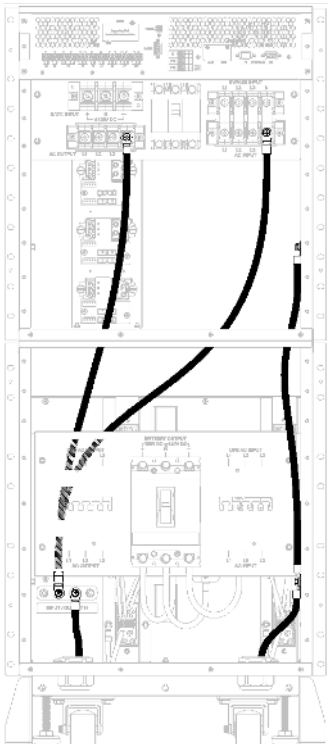


Fig 4-50: Secure the Neutral and Ground Cables

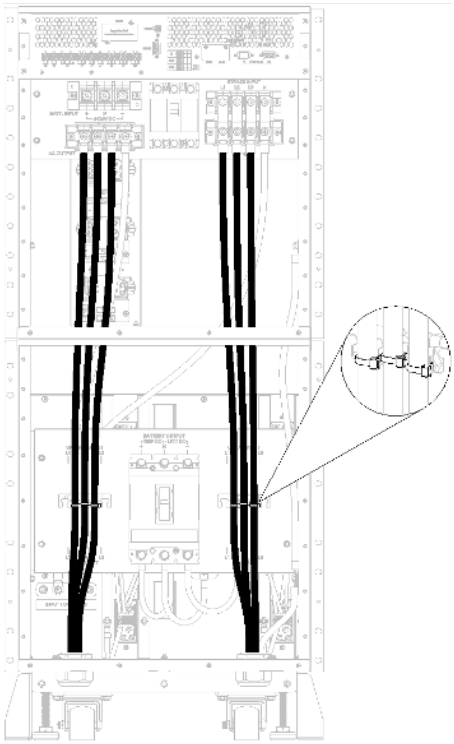


Fig 4-51: Secure the Input and Output Cables on UPS Cabinet

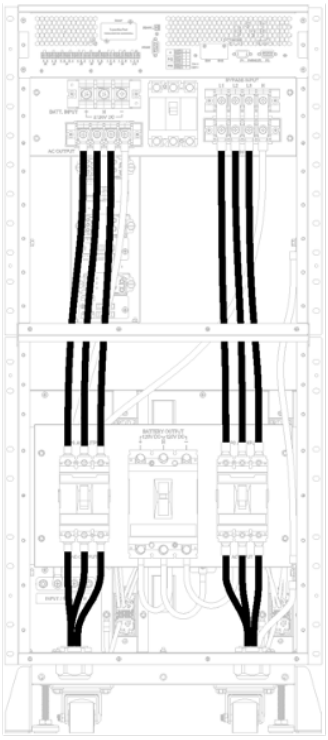


Fig 4-52: Secure the Input and Output Cables on UPS Cabinet and Battery Cabinet with Optional Breakers

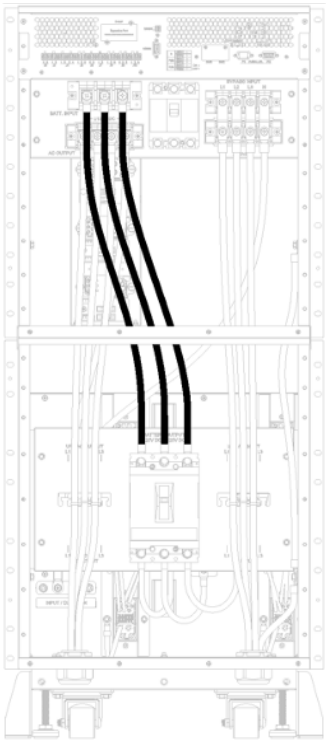


Fig 4-53: Connect the Battery Cables

24. Place the power modules into UPS cabinet and secure the screws on UPS cabinet. (See Figure 4-58)
25. Place the battery modules into battery cabinet and secure the screws on battery cabinet. (See Figure 4-59)
26. Secure the front cover brackets on battery cabinet. (See Figure 4-60)
27. Secure the front perimeter strip brackets of UPS and battery cabinets. (See Figure 4-61)

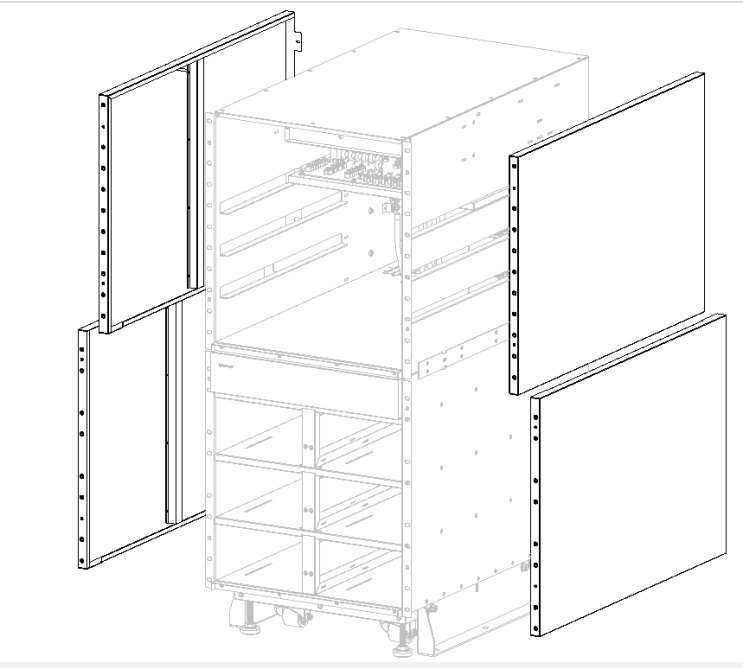
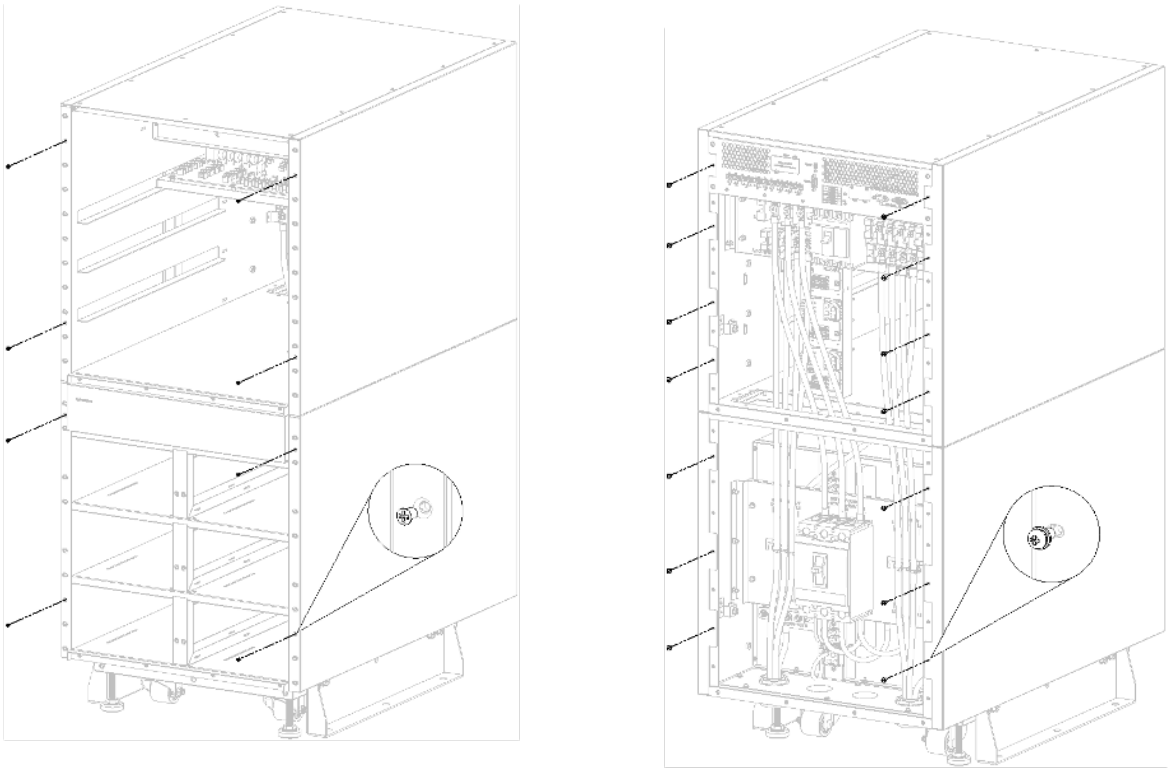


Fig 4-54: Hang Up the Side Panels



Front View

Back View

Fig 4-55: Secure the Screws for Side Panels

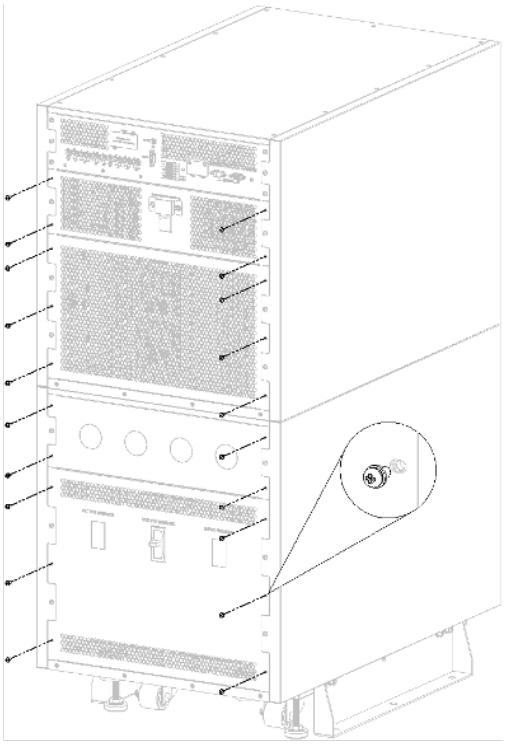


Fig 4-56: Secure the Screws for Back Cover Panels

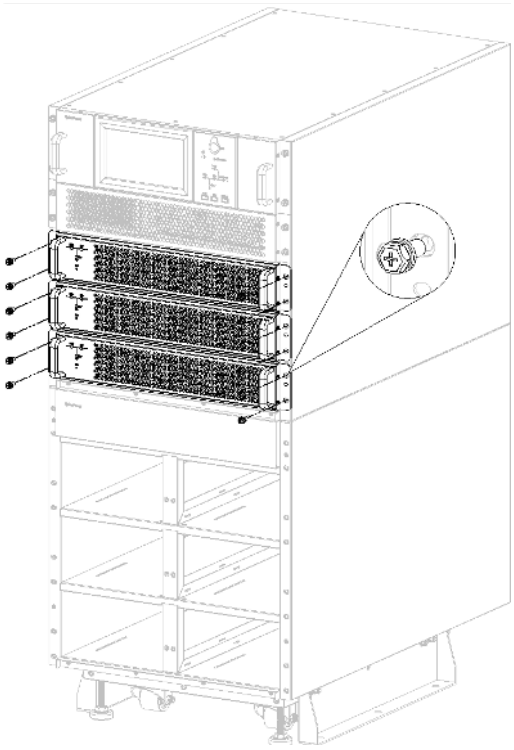


Fig 4-57: Place Bypass Module into UPS Cabinet and Secure the Screws

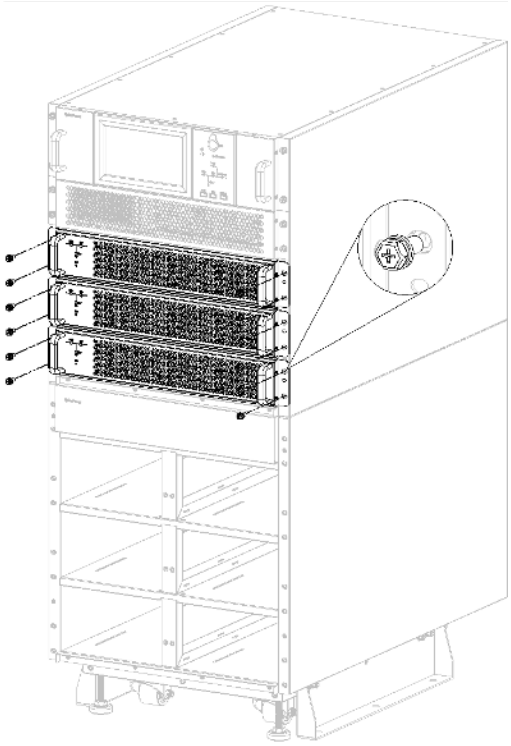


Fig 4-58: Place Power Modules into UPS Cabinet and Secure the Screws

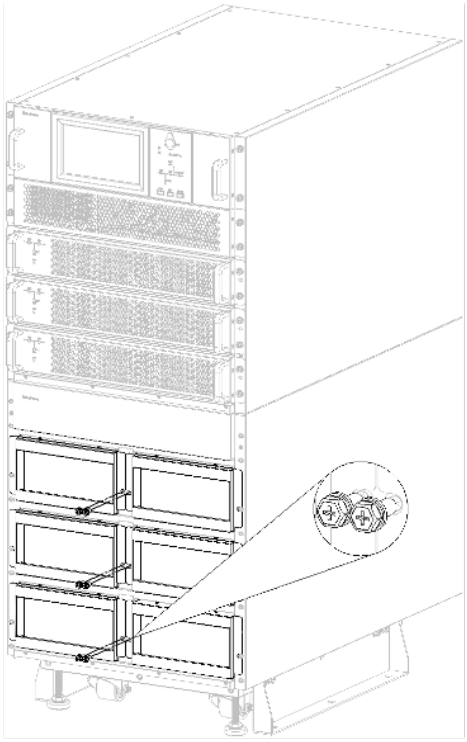


Fig 4-59: Place Battery Modules into Battery Cabinet and Secure the Screws

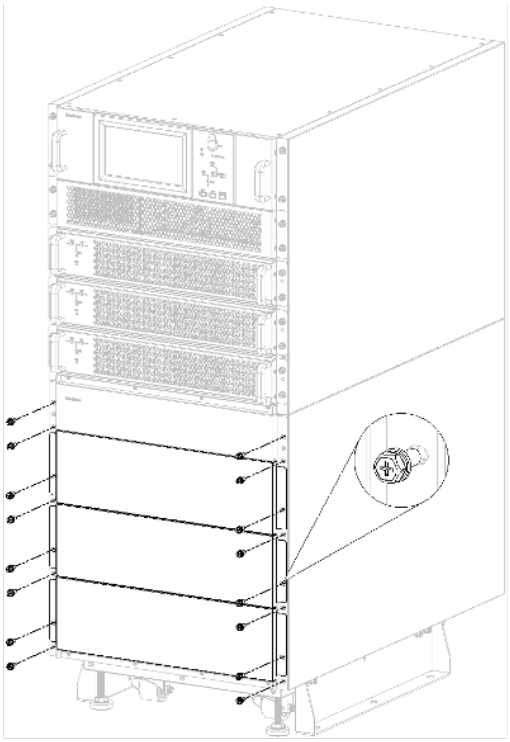


Fig 4-60: Secure Battery Front Cover Brackets

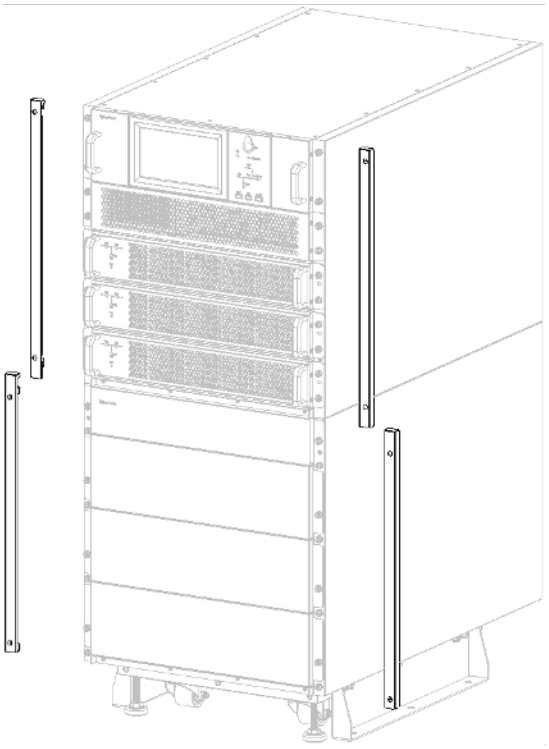


Fig 4-61: Secure Front Perimeter Strip Brackets of UPS and Battery Cabinets

4.5.2 Tower Stacked with Three Cabinets

⚠	**NOTICE** The three cabinet stack only for one SM-20KVA UPS cabinet and two BCT3L9N125 battery cabinets.

To stack the UPS cabinet on top of two battery cabinets:

1. The first battery cabinet: repeat section 4.5.1 procedures 1 through 5.
2. The UPS cabinet: repeat section 4.5.1 procedures 6 through 9.
3. The second battery cabinet: repeat section 4.5.1 procedures 1 through 5. Then, refer section 4.5.1 procedures 7, 8 and 9 to remove the caster holder brackets and the floor mounted brackets of second battery cabinet.
4. Stack the second battery cabinet on top of the first battery cabinet.
5. Refer to section 4.5.1 procedures 11 and 12 to secure the side straps between the two battery cabinets.
6. Stack the UPS cabinet on top of the second battery cabinet.
7. Refer to section 4.5.1 procedures 11 and 12 to secure the side straps between the UPS cabinet and the second battery cabinet. (See Fig 4-62 and Fig 4-63)

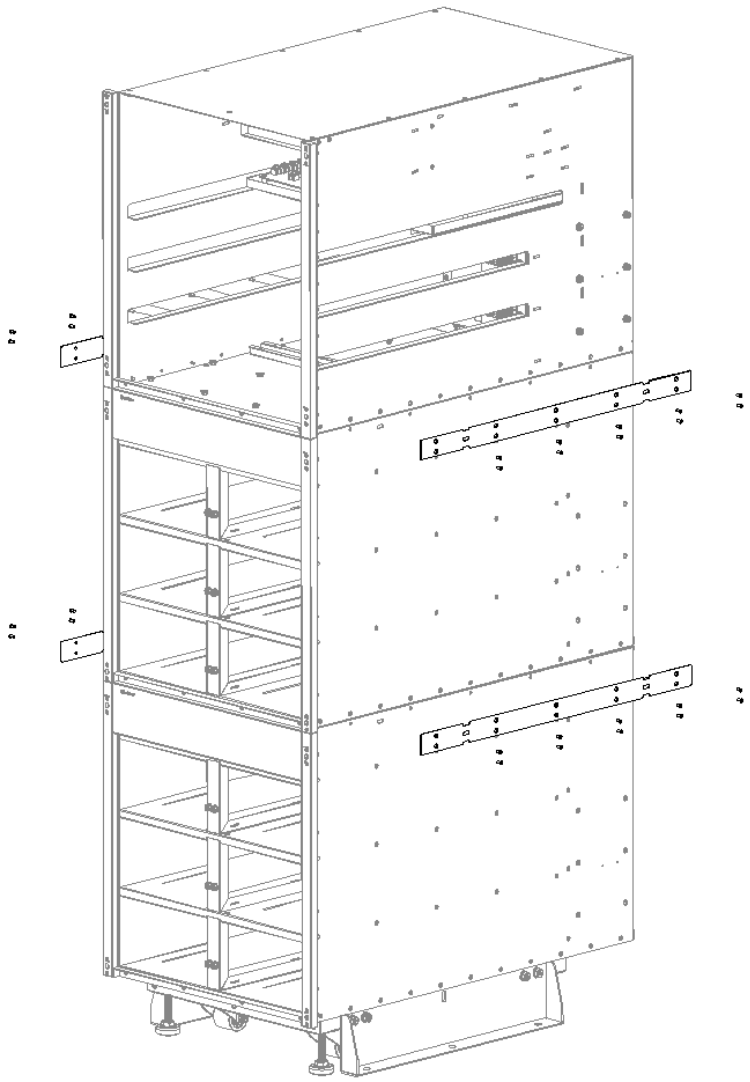


Fig 4-62: Secure the Side Straps Between UPS and Second Battery Cabinet (1)

Fig 4-63: Secure the Side Straps Between UPS and Second Battery Cabinet (2)

8. Remove the bolts securing the back cover panel to the three cabinets and remove the back cover panel of UPS and two battery cabinets. (See Figure 4-64)

9. Remove the bolts securing the conduit plate to the three cabinets and remove the conduit plates of UPS cabinet and two battery cabinets. (See Figure 4-65)

10. **Single-Feed**
    Secure two cable glands to battery conduit plate for input and output cable entry and secure the conduit plate to first battery cabinet. (See Figure 4-66)

    Dual-Feed
    Secure three cable glands to battery conduit plate for AC input, AC output and BYPASS input cable entry and secure the conduit plate to first battery cabinet. (See Figure 4-67)

11. Connect the neutral input and output connections on UPS cabinet to neutral bar on second battery cabinet, connecting the cable between UPS cabinet ground bar and second battery cabinet ground bar, connect the cable between two battery cabinets ground bar, secure the neutral cables of input and output cables to neutral bar on battery cabinet and secure the outer ground cable to first battery cabinet ground bar. (See Figure 4-68)

12. **(For without optional input breaker and output breaker on battery cabinets)**

    Single-Feed
    Connect the input cables (L1/L2/L3) and output cables (L1/L2/L3) to the connections on UPS cabinet. Use cable tie to secure the cables on battery cabinets. (See Figure 4-69)

    Dual-Feed
    Connect the input cables (L1/L2/L3), output cables (L1/L2/L3) and bypass input cables (L1/L2/L3) to these connections on UPS cabinet. Use cable tie to secure these cables on battery cabinets. (See Figure 4-70)

13. **(For with optional input breaker and output breaker on second battery cabinet)**

    Single-Feed
    Connect the input connections (L1/L2/L3) and output connections (L1/L2/L3) on UPS cabinet to upside connections of input breaker and output breaker on second battery cabinet. Secure the input cables (L1/L2/L3) and output cables (L1/L2/L3) to downside connections of input breaker and output breaker. (See Figure 4-71)

    Dual-Feed
    Connect the input connections (L1/L2/L3) and output connections (L1/L2/L3) on UPS cabinet to upside connections of input breaker and output breaker on second battery cabinet. Connect the bypass input cables (L1/L2/L3) to these connections on UPS cabinet. Secure the input cables (L1/L2/L3) and output cables (L1/L2/L3) to downside connections of input breaker and output breaker. (See Figure 4-72)

14. Connect the battery connections on UPS cabinet to upside connections of battery breaker on second battery cabinet. Connect the upside connections of battery breaker on second battery cabinet to upside connections of battery breaker on first battery cabinet. (See Figure 4-73)

15. Refer section 4.5.1 procedure 20, 21 and 22 to secure side panels and back cover panels on UPS cabinet and two battery cabinets.
16. Refer section 4.5.1 procedure 23, 24 and 25 to put bypass module and power module into UPS cabinet, put battery module into two battery cabinets.
17. Refer section 4.5.1 procedure 26 and 27 to secure front cover brackets on battery cabinet and secure these front perimeter strip brackets of UPS and two battery cabinets.

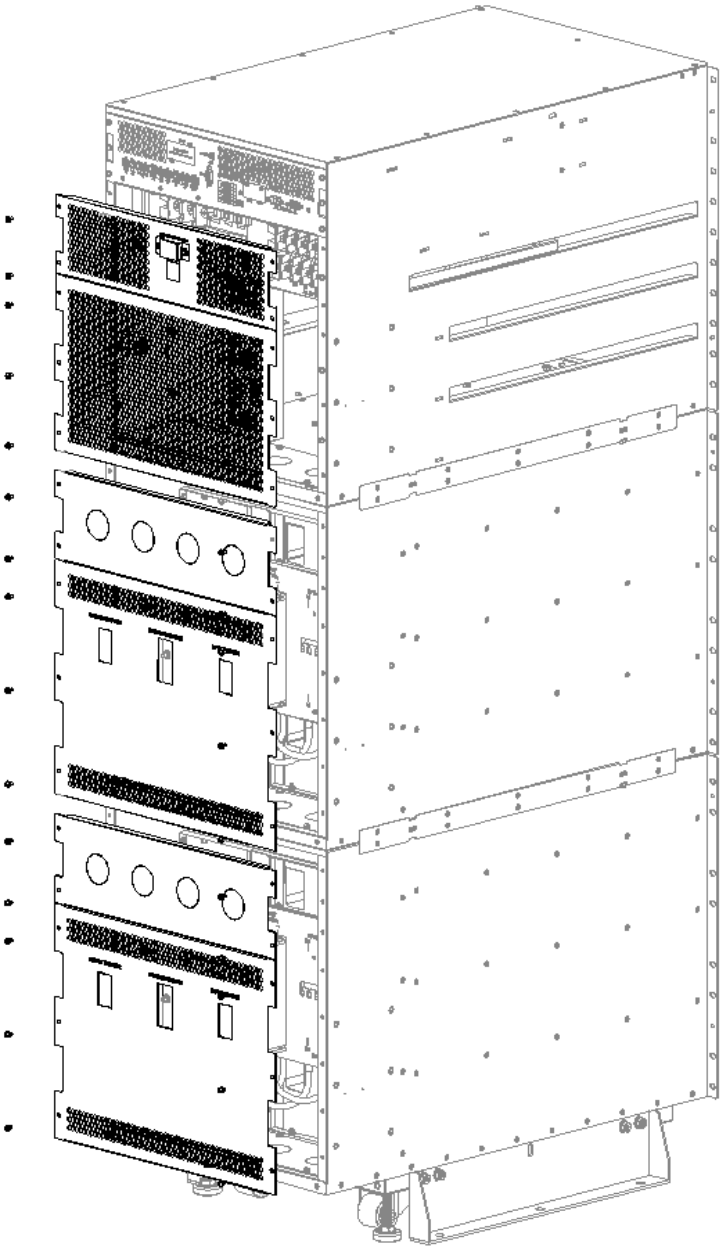


Fig 4-64: Remove the Back Cover Brackets of UPS and two Battery Cabinets

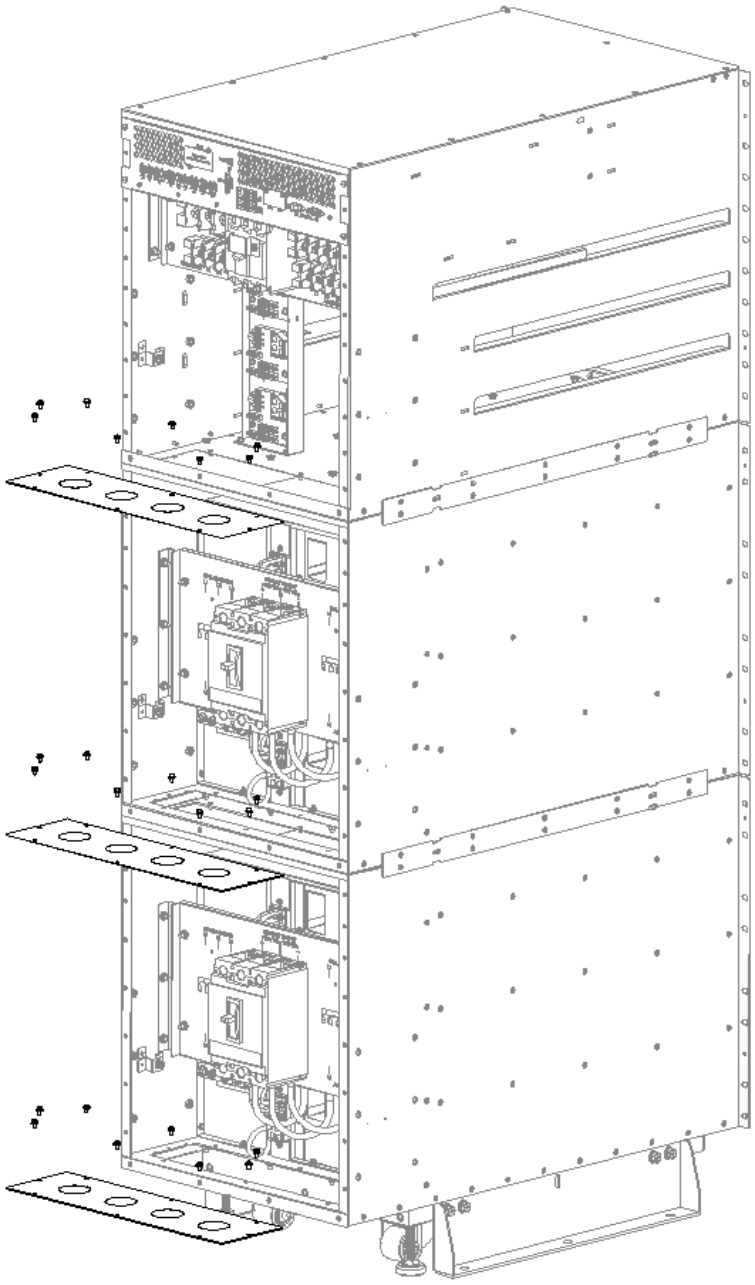


Fig 4-65: Remove the Conduit Plates of UPS and Two Battery Cabinets

CHAPTER 4 SYSTEM INSTALLATION

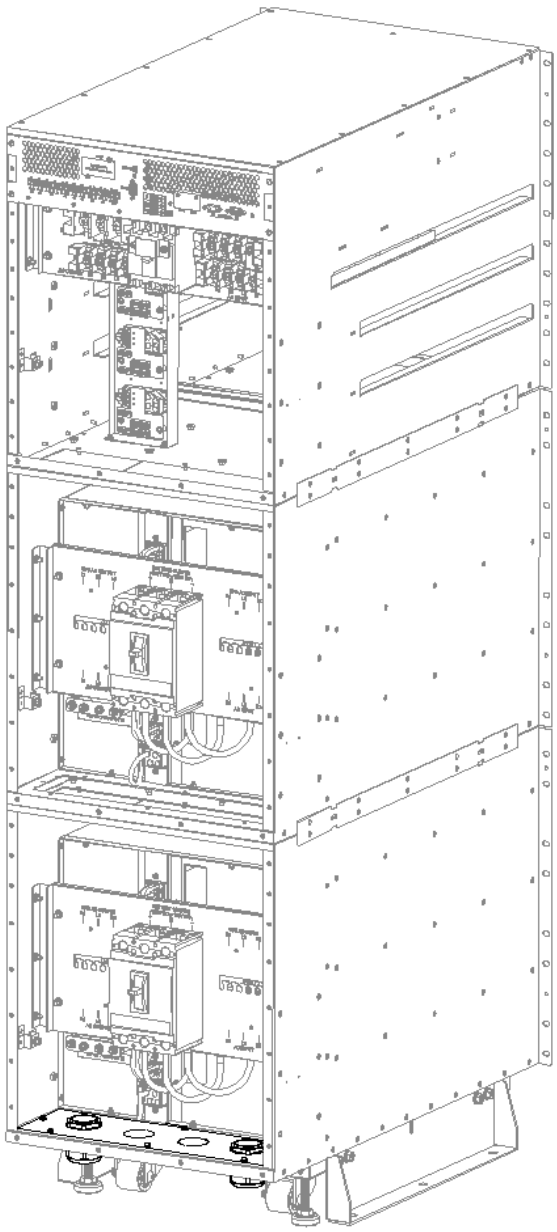


Fig 4-66: Secure the Cable Gland and Conduit Plates of Bottom Battery Cabinet for Single-Feed

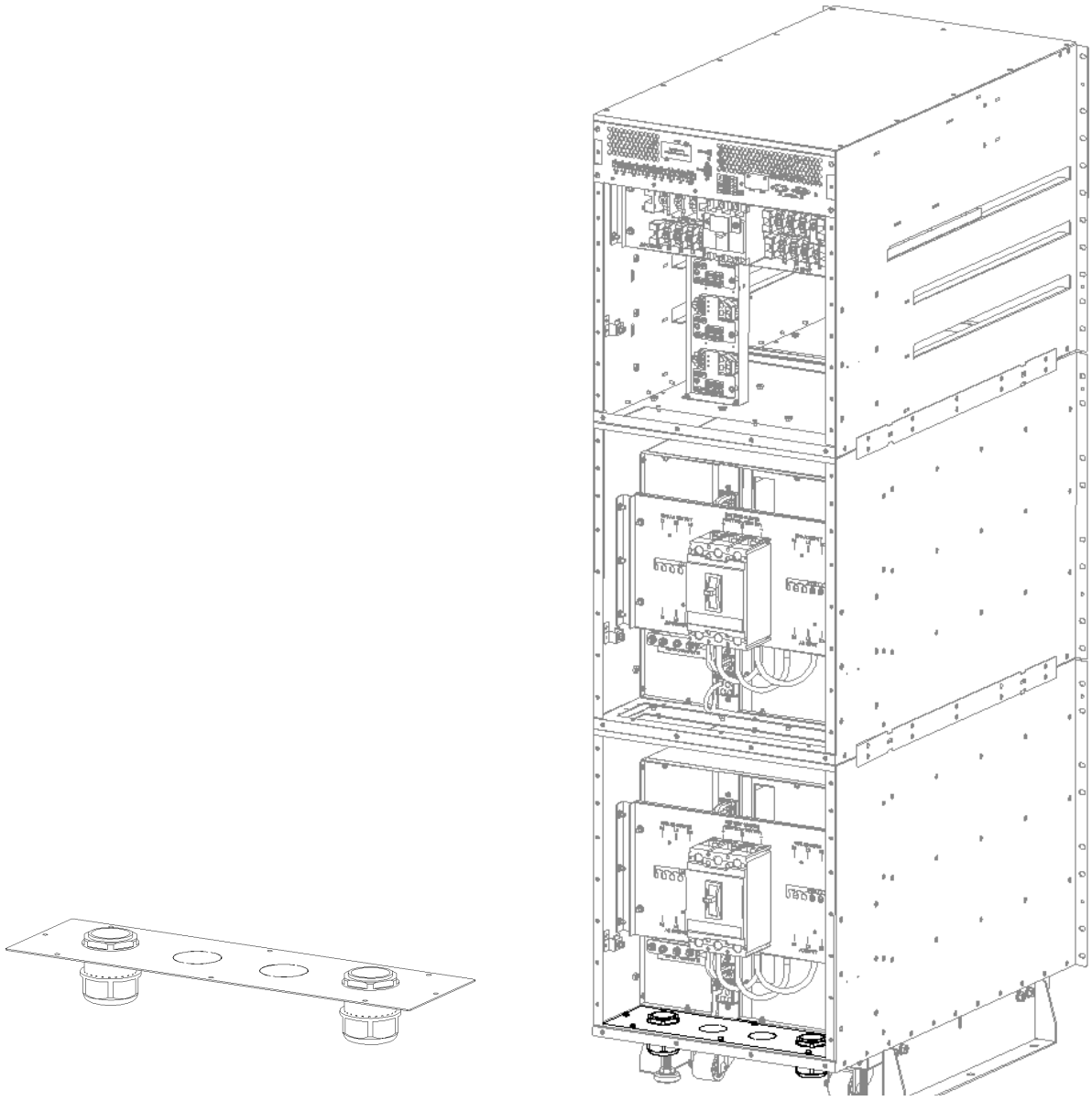


Fig 4-67: Secure the Cable Gland and Conduit Plates of Bottom Battery Cabinet for Dual-Feed

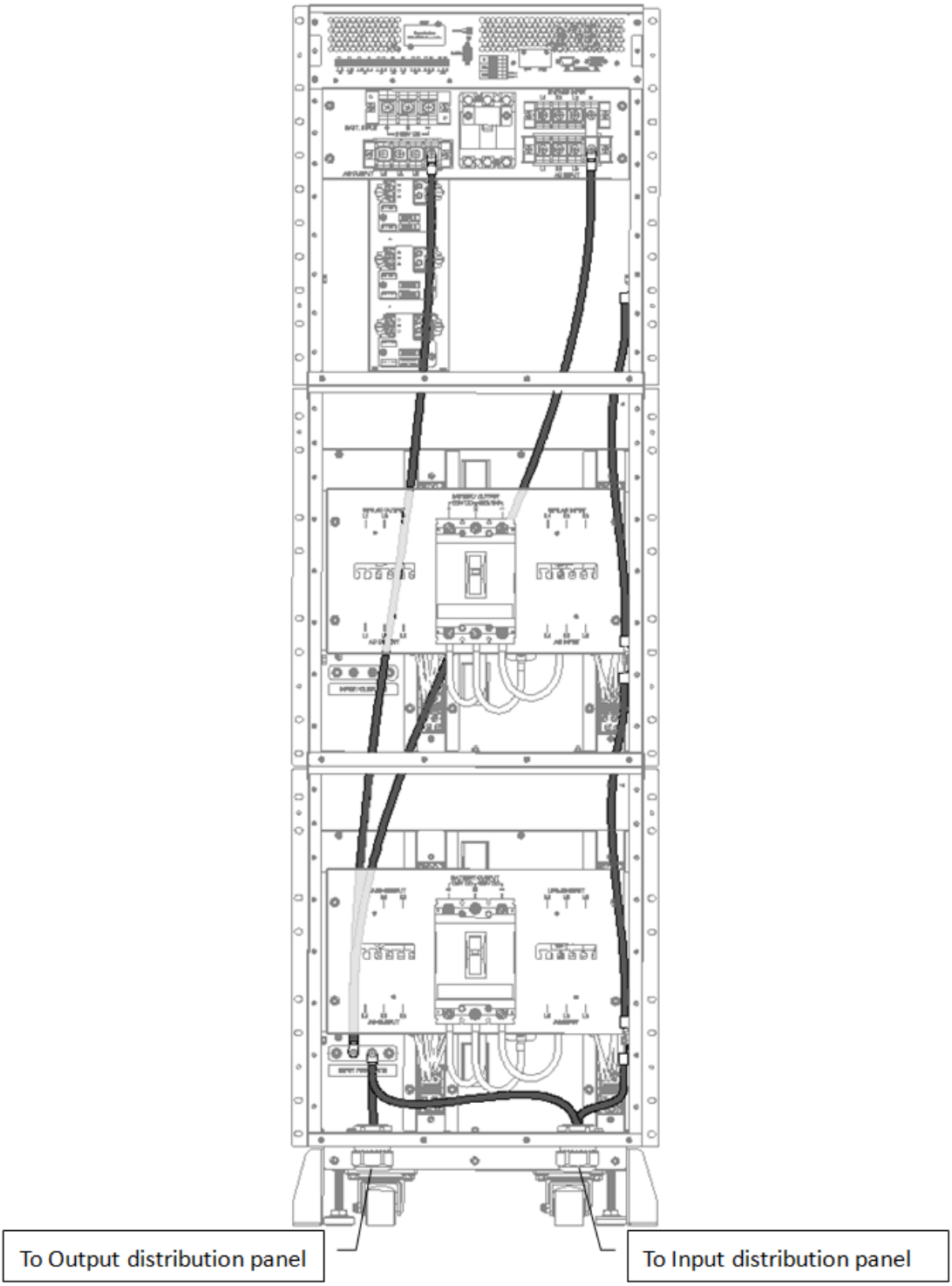


Fig 4-68: Secure the Neutral and Ground Cables

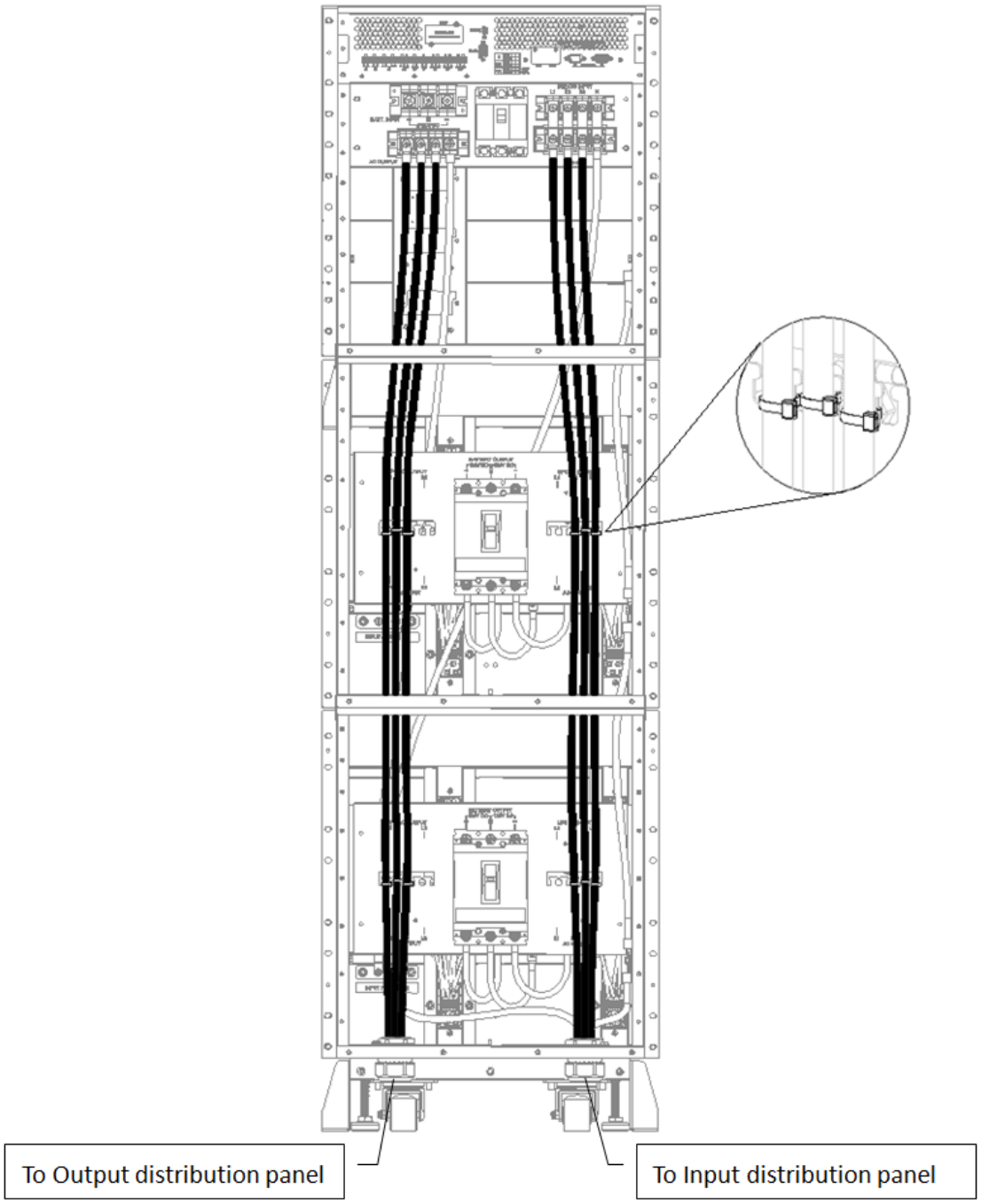


Fig 4-69: Secure the Input and Output Cables on UPS Cabinet for Single-Feed

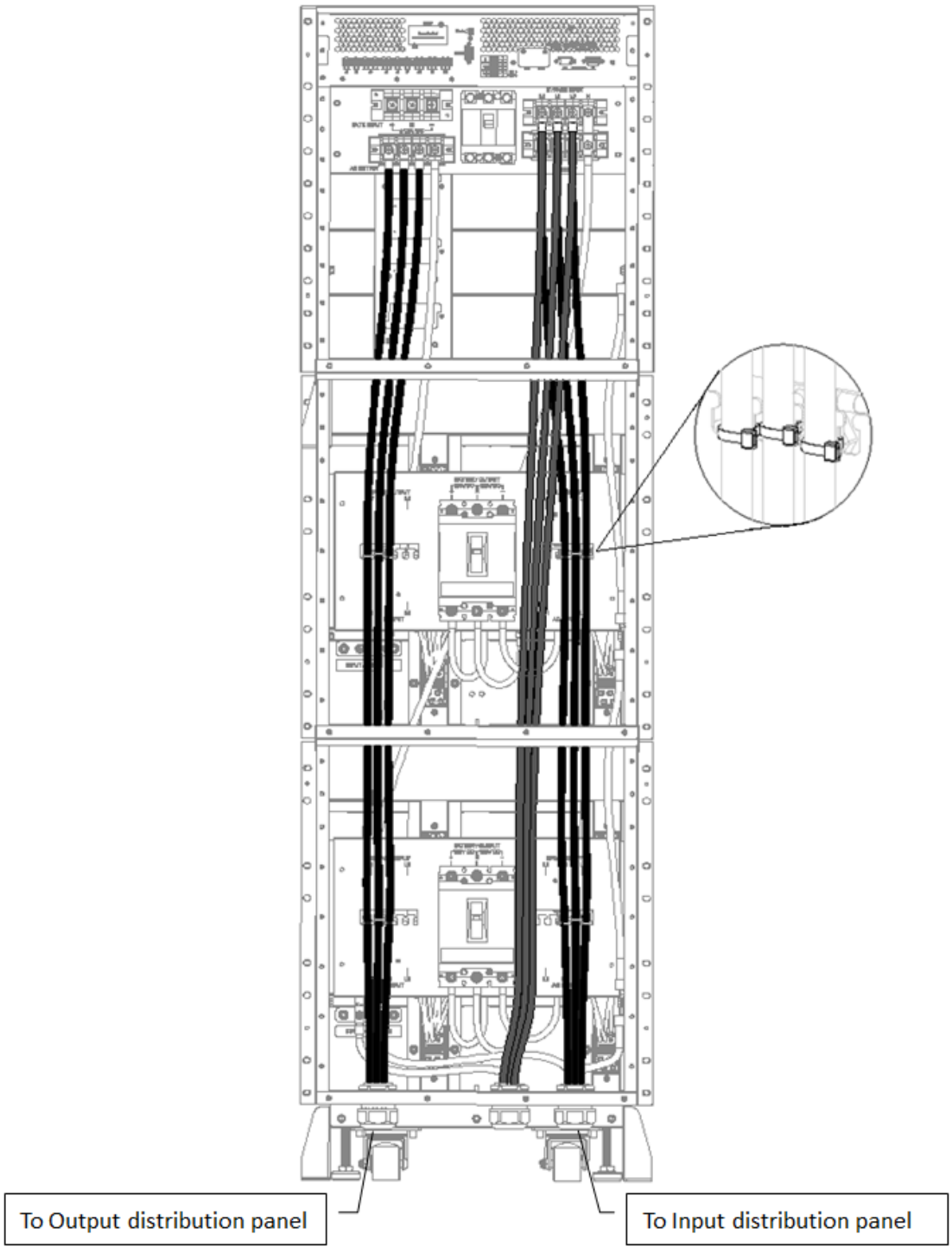


Fig 4-70: Secure the Input and Output Cables on UPS Cabinet for Dual-Feed

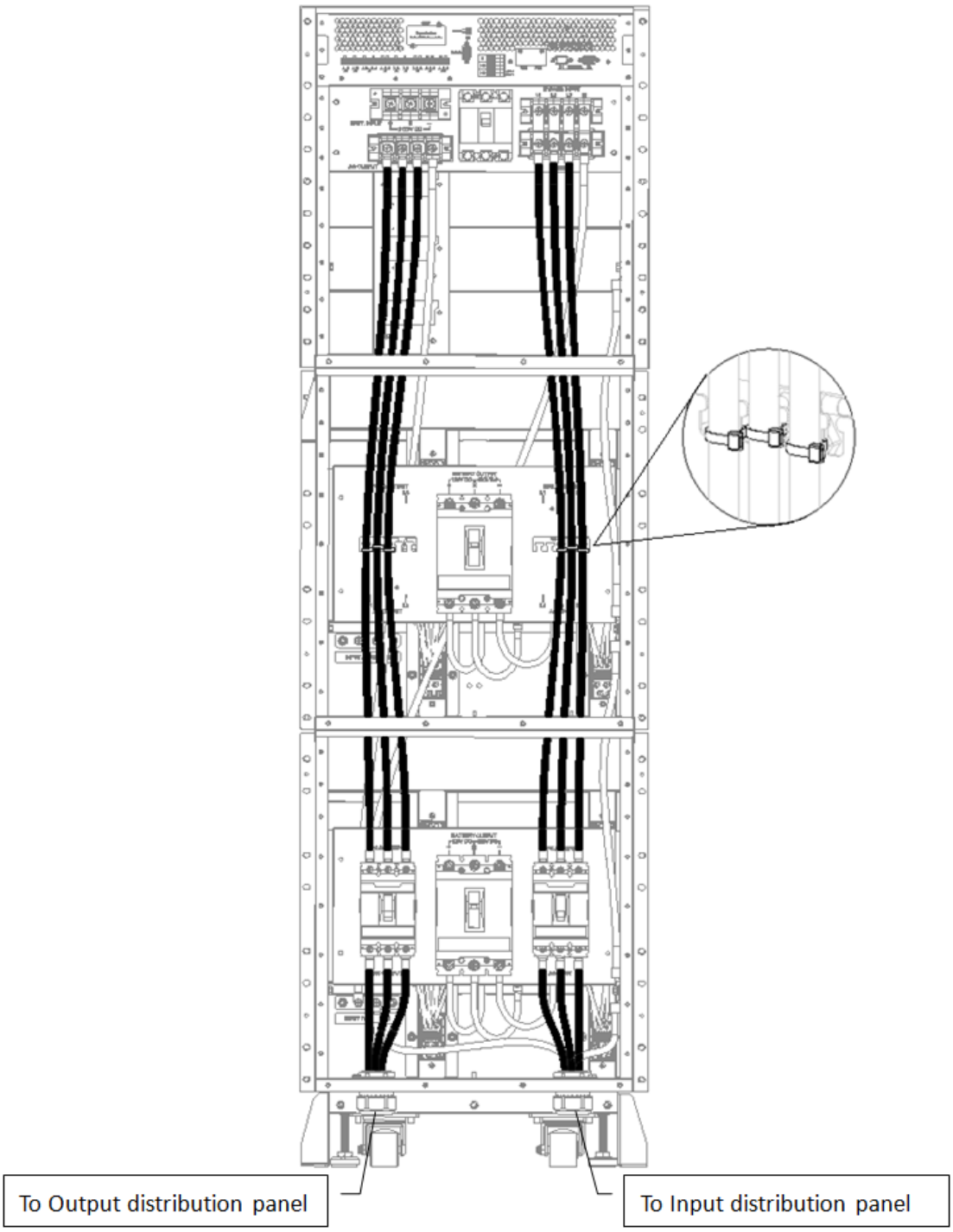


Fig 4-71: Secure the Input and Output Cables on UPS Cabinet and Battery Cabinet with Optional Breakers for Single-Feed

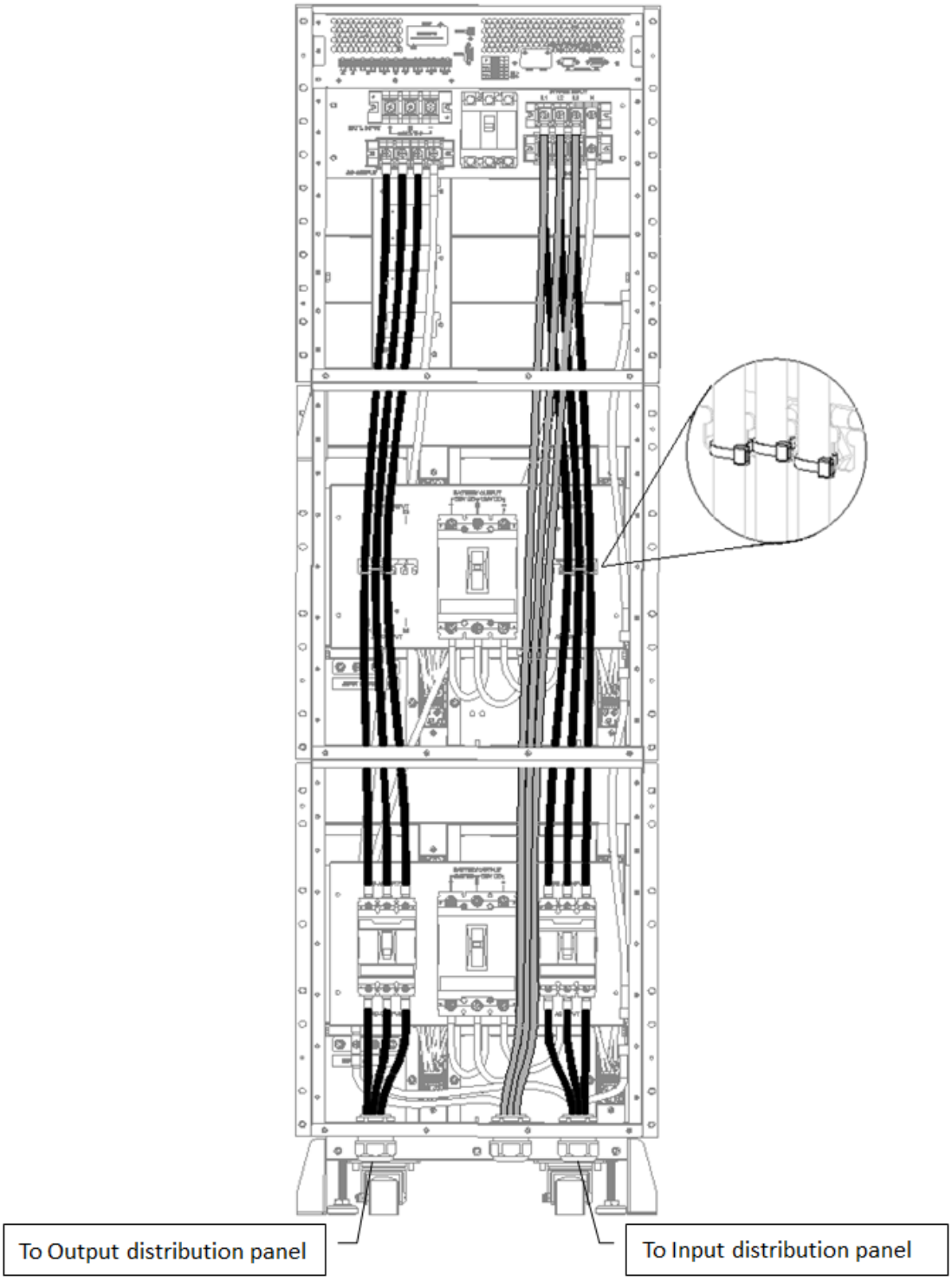


Fig 4-72: Secure the Input and Output Cables on UPS Cabinet and Battery Cabinet with Optional Breakers for Dual-Feed

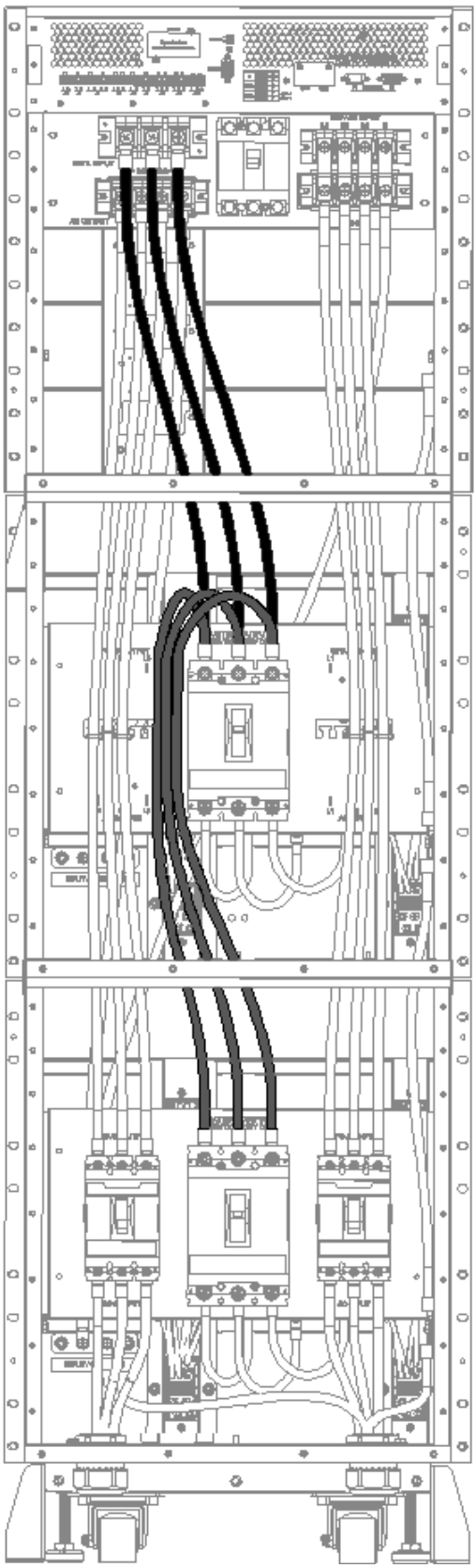


Fig 4-73: Connect the Battery Cables

CHAPTER 4 SYSTEM INSTALLATION

4.6 Installing the Rack Mounted UPS and Battery Cabinets

⚠	**WARNING** The UPS cabinet, Bypass module, and Power module are all very heavy. Use at least two people to life each piece of equipment.
⚠	**NOTICE** The rack cabinet is standard 19". For rack mounted installation, please prepare M6 cage nuts and M6 bolts.

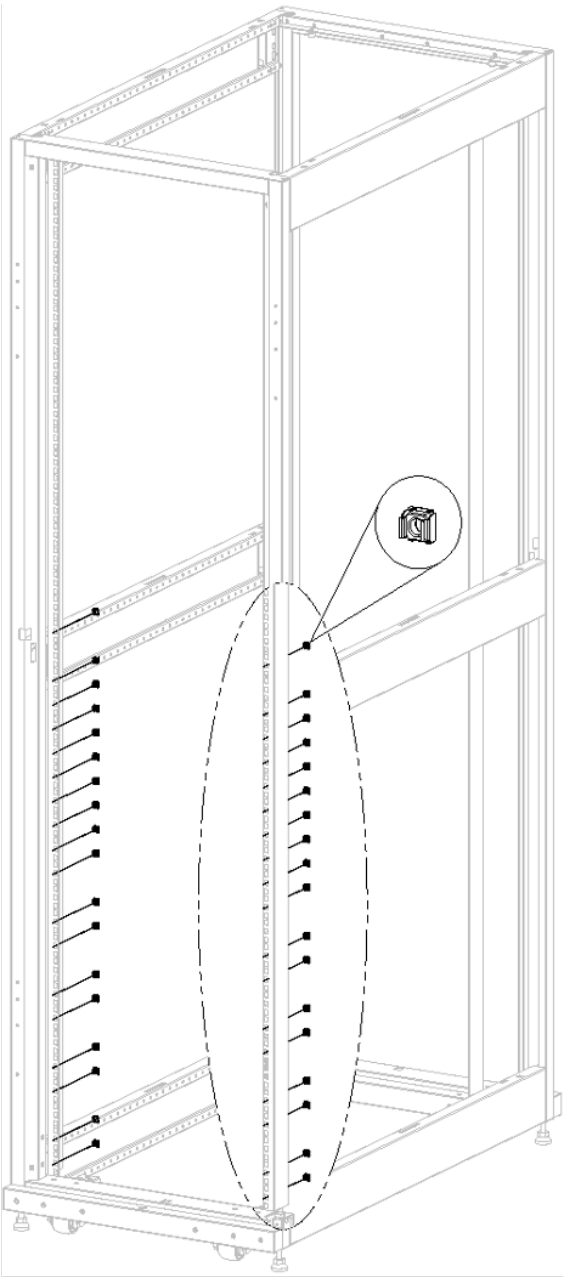


Fig 4-74: Rack Cabinet Cage Nuts Location for SM-20kVA UPS and BCT3L9N125 (front view)

APPENDIX A - RING TERMINAL ACCESSORIES

SM020KAMFA			
Ring Terminal	**Quantity**	**Heat Shrink Tube**	**Quantity**
RNB14-8	4	9Φ	20
RNBM5-6	17	14Φ	23
RNBS38-8	4		
RNBS22-6	15		
RNBS8-6	3		

BCT3L9N125			
Ring Terminal	**Quantity**	**Heat Shrink Tube**	**Quantity**
RNB14-8	8	9Φ	25
RNBM5-6	22	14Φ	36
RNBS38-8	8		
RNBS22-6	20		
RNBS8-6	3		

BCT3L9N125			
Ring Terminal	**Quantity**	**Heat Shrink Tube**	**Quantity**
RNB14-10	4	10Φ	20
RNB5.5-8	17	11Φ	10
RNB22-8	15	20Φ	57
RNB8-8	3		
RNBS38-10	4		
RNB14-8	6		
RNB70-10	4		
RNBS38-8	15		
RNB60-8	15		
RNB80-10	4		

APPENDIX A - RING TERMINAL ACCESSORIES

BCT6L9N225			
Ring Terminal	**Quantity**	**Heat Shrink Tube**	**Quantity**
RNB14-10	8	10Φ	25
RNB5.5-8	22	11Φ	14
RNB22-8	20	20Φ	84
RNB8-8	3		
RNBS38-10	8		
RNB14-8	6		
RNB70-10	8		
RNBS38-8	20		
RNB60-8	20		
RNB80-10	8		