



X90-5S/10S Modular Three-Phase UPS

User & Installation Manual

Table of Contents

1. Safety..... 3

2. Installation..... 5

3. Unpacking.....7

4.SMB Installation.....29

1. Safety

1.1 Important Safety Instructions

This battery cabinet contains LETHAL VOLTAGES. All repairs and service must be performed by AUTHORIZED SERVICE PERSONNEL ONLY. There are NO USER SERVICEABLE PARTS inside the battery cabinet.

WARNING:

- This battery cabinet is designed for commercial and industrial purpose, it is forbidden to apply for any life sustainment and support.
- The battery cabinet system contains its own energy source. The output terminals may carry live voltage even when UPS is disconnected to an AC source.
- To reduce the risk of fire or electrical shock, UPS installation has to be in a controlled room where temperature and humidity are monitored. Ambient temperature must not exceed 40°C. The system is only for indoor use.
- Ensure all power is disconnected before installation or service.
- Service and maintenance should be performed by qualified personnel only.

Before working on this circuit

- Isolate Uninterruptible Power System (UPS).
- Then check for Hazardous Voltage between all terminals including the protective earth.



Risk of Voltage Backfeed

The isolation device must be able to carry the UPS input current.

1.2 EMC

WARNING:

This is a product for commercial and industrial application in the second environment - installation restrictions or additional measures may be needed to prevent disturbances.

1.3 Installation Information

WARNING:

- Installation must be performed by qualified personnel only.
- The cabinets must be installed on a level floor suitable for computer or electronic equipment.
- The UPS cabinet is heavy. If unloading instructions are not closely followed, cabinet may cause serious injury.
- Do not tilt the cabinets more than 10 degree.
- Before applying electrical power to the UPS, make sure the Ground conductor is properly installed.
- Installation and Wiring must be performed in accordance with the local electrical laws and regulations.
- The disconnection device should be chosen based on the input current and should break line and neutral conductors - four poles for three phases.

1.4 Maintenance

- Only qualified service personnel should perform the battery installation.
- The following PRECAUTIONS should be observed:

1. Remove watches, rings, or other metal objects.
 2. Use tools with insulated handles.
 3. Wear rubber gloves and boots.
 4. Do not lay tools or metal parts on top of batteries or battery cabinets.
 5. Disconnect the charging source prior to connecting or disconnecting terminal.
 6. Check if the battery is inadvertently grounded. If it is, remove the source of grounding. Contacting with any part of the ground might result in electrical shock. The likelihood of such shock can be prevented if such grounds are removed during installation and maintenance.
- UPS is designed to supply power even when disconnected from the utility power. After disconnect the utility and DC power, authorized service personnel should attempt internal access to the UPS.
 - Do not disconnect the batteries while the UPS is in Battery mode.
 - Disconnect the charging source prior to connecting or disconnecting terminals.
 - Batteries can result in a risk of electrical shock or burn from high short circuit current.
 - When replacing batteries, use the same number of sealed, lead-acid batteries.
 - Do not open or mutilate the battery. Release electrolyte is harmful to the skin and eyes, and may be toxic.

1.5 Recycling the Used Battery

- Do not dispose of the battery in a fire. Battery may explode. Proper disposal of battery is required. Refer to your local codes for disposal requirements.
- Do not open or mutilate the battery. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- Do not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed properly. For more information, contact your local recycling/reuse or hazardous waste center.
- Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

2. Unpacking

1. Use a forklift to move the product to installed area. Refer to Figure 2-1. Please make sure the bearing capacity of forklift is sufficient.
2. Please remove wooden case and foam according to order figure 2-2.

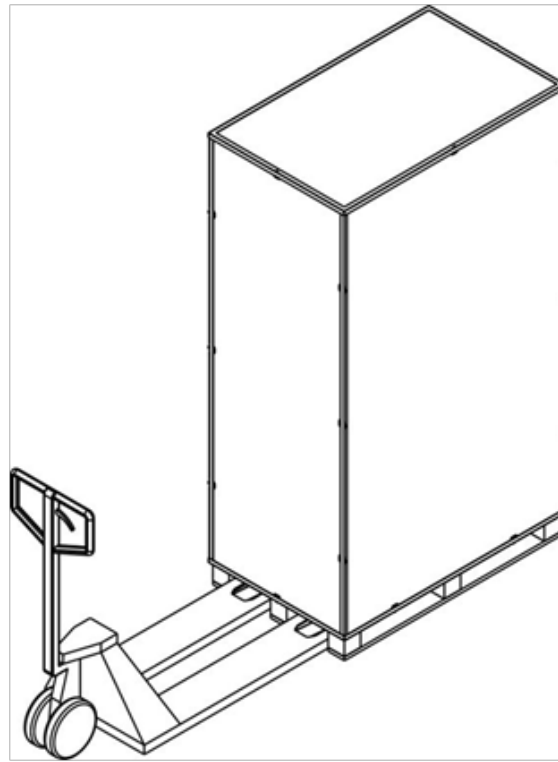


Figure 2-1

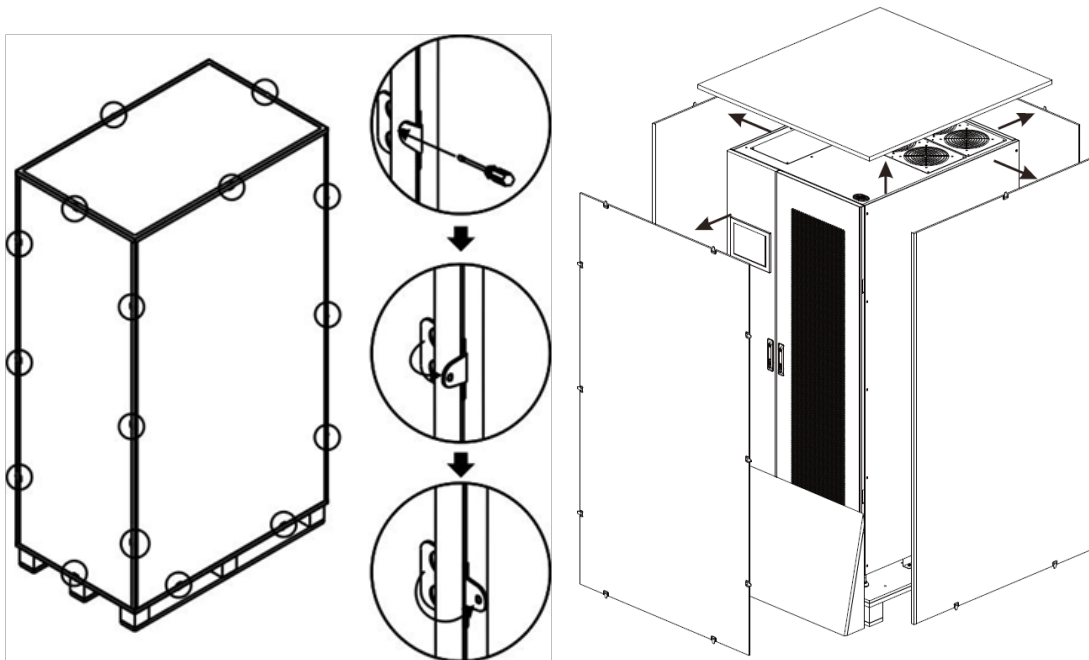


Figure 2-2

3. Put a ramp in the front of the cabinet. Refer to Figure 2-3.

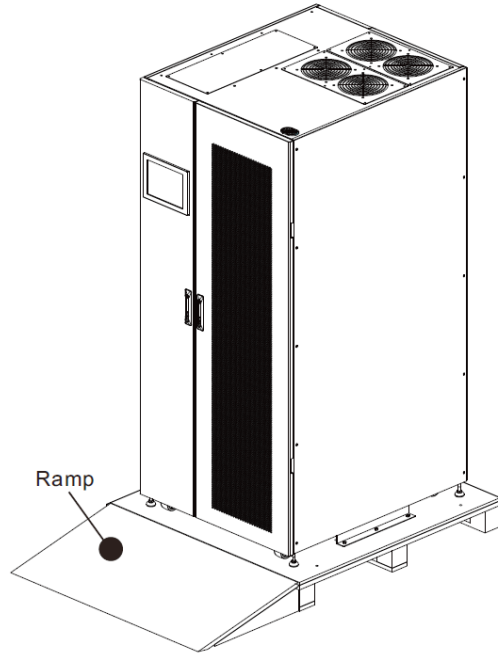


Figure 2-4

4. Remove 2 fixing cabinet plates and loosen leveling feet by rotating them counterclockwise. Then, move the cabinet from the pallet. Refer to Figure 2-4.

5. To fix the cabinet in position, simply rotate leveling feet clockwise. Refer to Figure 2-5.

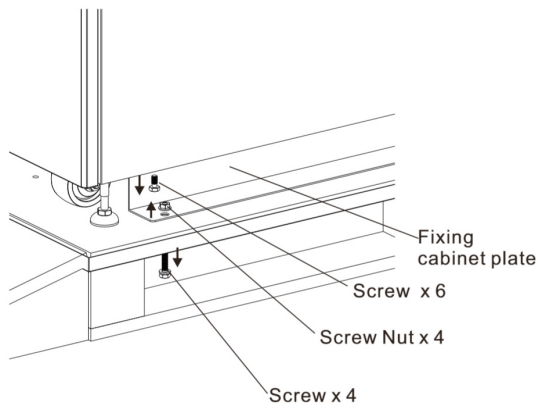


Figure 2-4

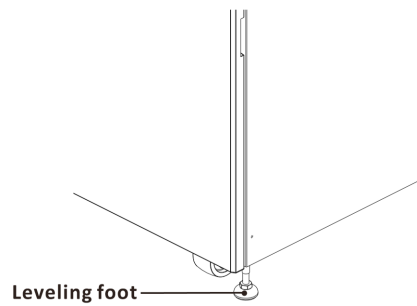


Figure 2-5

3. Installation

1. Visually examine if there is any damage inside and outside of packages in the process of the transportation. If any damage, report it to the carrier immediately.
2. Verify the product label and confirm the consistency of the equipment.
3. If the equipment needs to be returned, carefully repack the equipment by using the originally packing material that came with.

2.2 Installation Environment

1. The UPS is designed for indoor use only and should be located in a clean environment with adequate ventilation to keep the environmental parameters within the required specification.
2. Make sure that transportation routes (e.g. corridor, door gate, elevator, etc.) and installation area can accommodate and bear the weight of the UPS, the external battery cabinet and handling equipment.
3. The UPS uses forced convection cooling by internal fans. Cooling air enters the module through ventilation grills located at the front of the cabinet and exhausted through grills located in the rear part of the cabinet. Please do not block the ventilation holes.
4. Ensure that the installation area is spacious for maintenance and ventilation.
5. Keep the temperature of installation area below 40°C and humidity within 90%. The highest operating altitude is 1000 meters above sea level.
6. If necessary, install a system of room extractor fans to avoid formation of room temperature. Air filters are necessary if the UPS is operated in a dusty environment.
7. It is recommended that you parallel the external battery cabinets to the UPS. The following instructions of clearances are suggested:
 - Keep a clearance of 100cm from the top of the UPS for maintenance, wiring and ventilation.
 - Keep a clearance of 150cm from the front of the UPS and the external battery cabinets for maintenance and ventilation.
8. For safety concerns, we suggest that you shall:
 - Equip with CO2 or dry powder fire extinguishers near the installation area.
 - Install the UPS in an area where the walls, floors and ceilings were constructed by fireproof materials.
9. Do not allow unauthorized personnel to enter the installation area. Assign specific personnel to keep the UPS key.

2.4 Moving the Cabinet

Warning

The UPS is fixed on the pallet with 2 fixing cabinet plates. When removing it, pay attention to the movement of the casters to avoid accidents.

The cabinet can be pushed forward or backward only. Pushing it sideward is not allowed. When pushing the cabinet, pay attention not to overturn it as the gravity center is high.

1. If you need to move the UPS over a long distance, please use appropriate equipment like a forklift. Do not use the UPS casters to move over a long distance.
2. After the UPS has been removed from the pallet to ground, we suggest that at least three people move the UPS to the installation area. One person holds a lateral side of the UPS with hands, another holds the other lateral side of the UPS with hands, and the other person pushes the UPS either from the front side or from the back side to the installation area and avoid tipping the UPS.
3. The casters are designed to move on level ground. Do not move the UPS on an uneven surface. This might cause damage to the casters. Toppling the UPS could also damage the unit.
4. Ensure that the weight of UPS is within the designated bearing capacity of any handling equipment.
5. At the bottom of the UPS, the four casters help you to move the UPS to a designated area. Before you move the UPS, please turn the four leveling feet counterclockwise to raise them off the ground. This protects the leveling feet from damage when moving the UPS.
6. Fix the cabinet firmly to the ground with screwing the fixing cabinet plate. Refer to Figure 2-6.

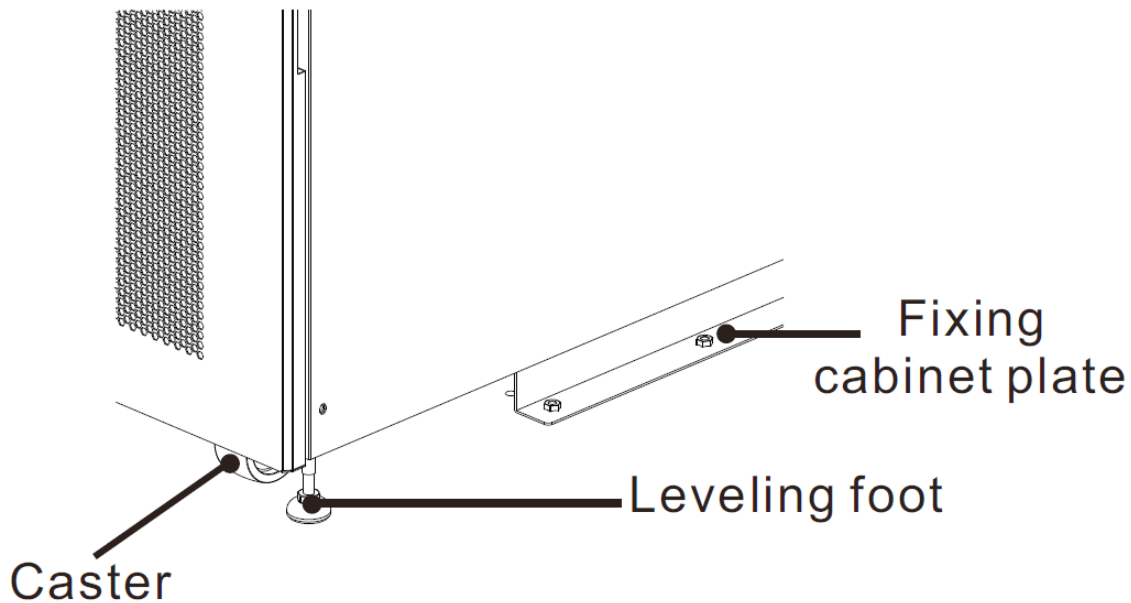
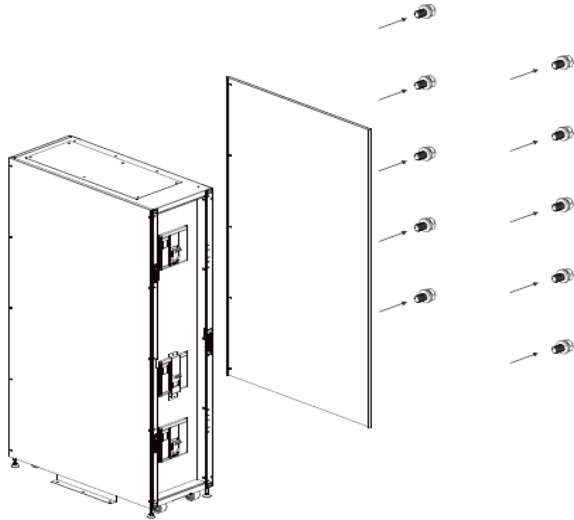


Figure 2-6

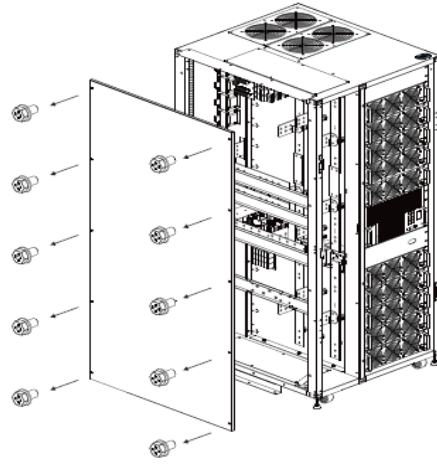
7. Assemble the cabinet

Step 1: Remove one side of case cover from switch and main cabinet.

Step 1: Remove the both side cover.

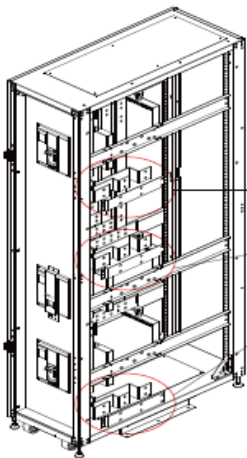


Slim bypass cabinet (optional)

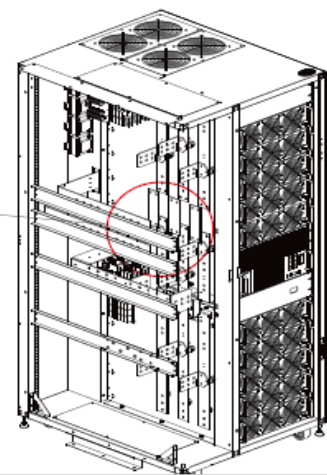
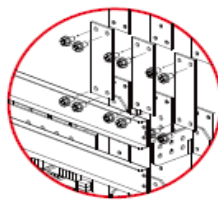
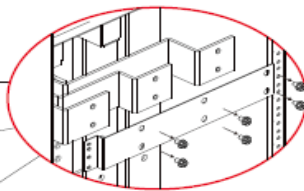


Main cabinet

Step 2: Remove bus bars of input 1 and bypass input on main cabinet. Remove all terminal retaining plates on slim bypass cabinet

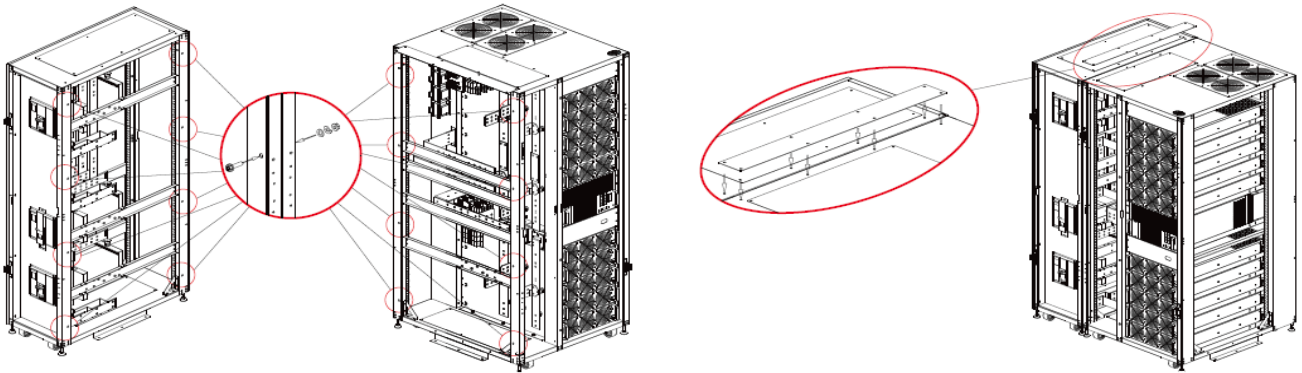


Slim bypass cabinet (optional)

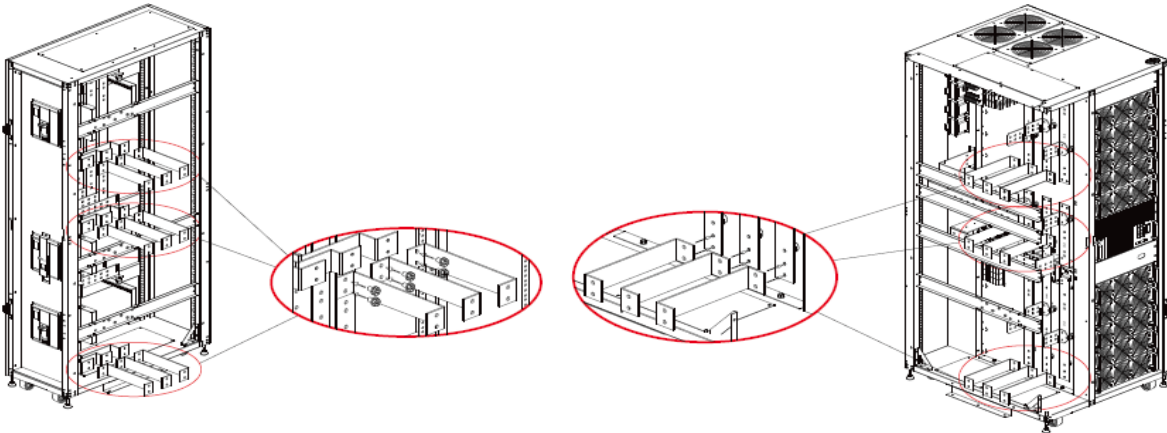


Main cabinet

Step 3: Align slim bypass cabinet and main cabinet and assemble both of cabinets together with supplied M10 screws, washers and spring washers. Fix long plate (supplied in slim bypass cabinet package) on the top of two cabinets.



Step 4: Use supplied 9 sets of bus bars to connect input, bypass and output terminals of Slim bypass cabinet and main cabinet.



2.5 Types of UPS Cabinet

The extended cabinets don't have the battery module compartments. The battery has to be connected externally. Please consider the external battery space and wiring gauge for installation.

Extended Series		
Model	X90-SMB350 / X90-ENC5S	X90-SMB700 / X90-ENC10S
Photo		
Cabinet Height	42U	42U
Switch Unit	3	3
STS	1	1
Max. Power Module	5	10
Max Power	350kVA	700kVA

2.6 Exterior

In the front of the UPS, there are control interface (LCD Panel) and door lock. The side panels are lockable. The casters at the bottom of the UPS cabinet can be used to move over short distances. There are four leveling feet to fix and stabilize the UPS cabinet on the ground. Refer to Figure 2-7. Inside the cabinet, there are Breakers, STS Module and Power Module slots. All wiring terminal blocks are located in the back of cabinet.

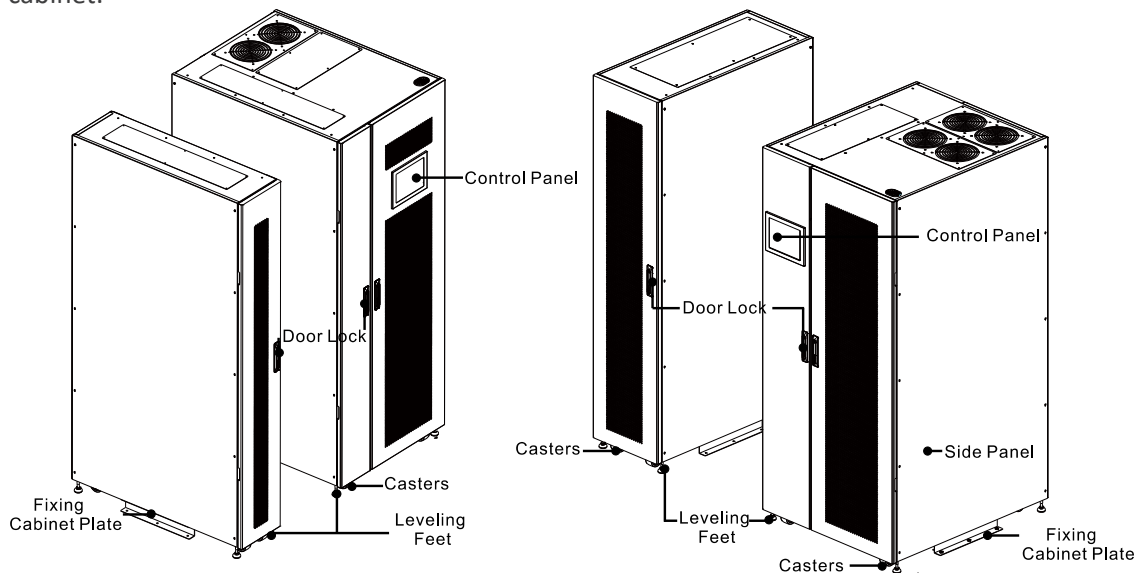


Figure 2-7 Exterior

2.6.1 Mechanical Data

Dimensions			
UPS cabinet	Width	Depth	Height
X90-SMB350 / X90-ENC5S	300/800mm	1065mm	2000mm
X90-SMB700 / X90-ENC10S	450/900mm	1065mm	2000mm

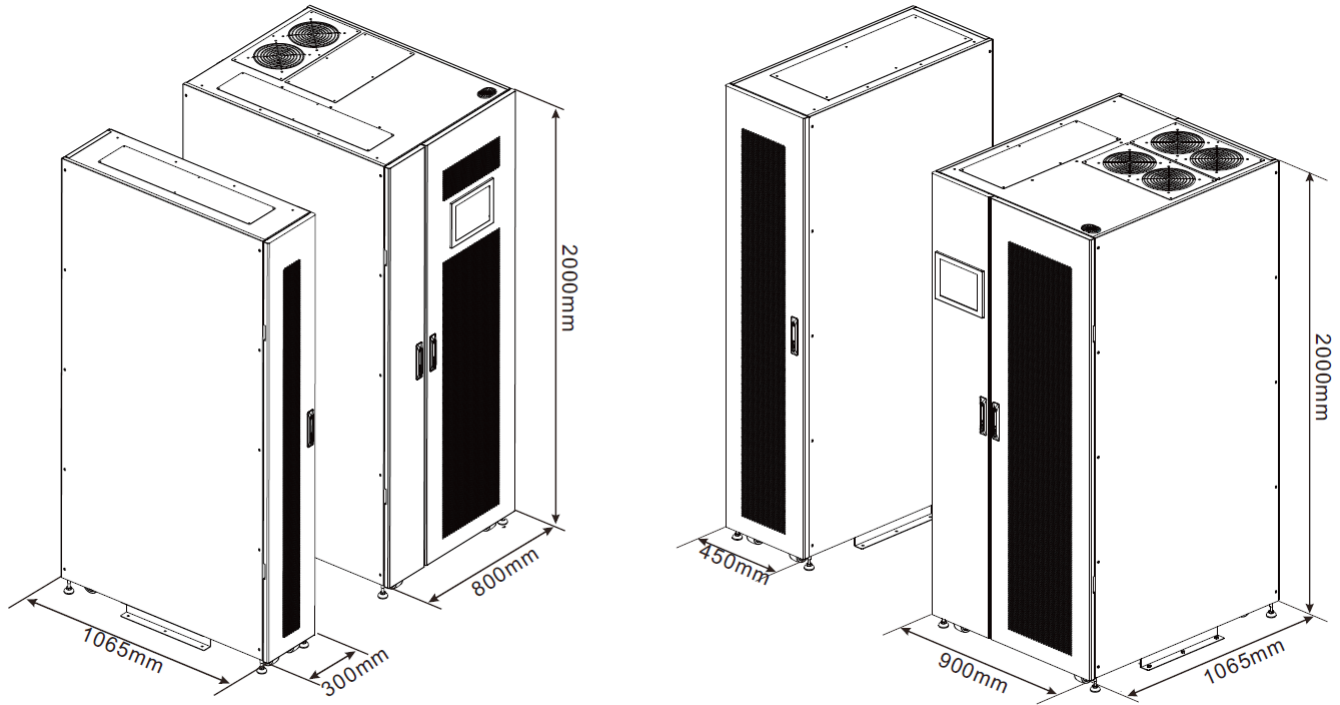


Figure 2-8 Dimensions

2.6.2 Front View

Dimensions			
UPS cabinet	Width	Depth	Height
X90-SMB350 / X90-ENC5S	300/800mm	1065mm	2000mm
X90-SMB700 / X90-ENC10S	450/900mm	1065mm	2000mm

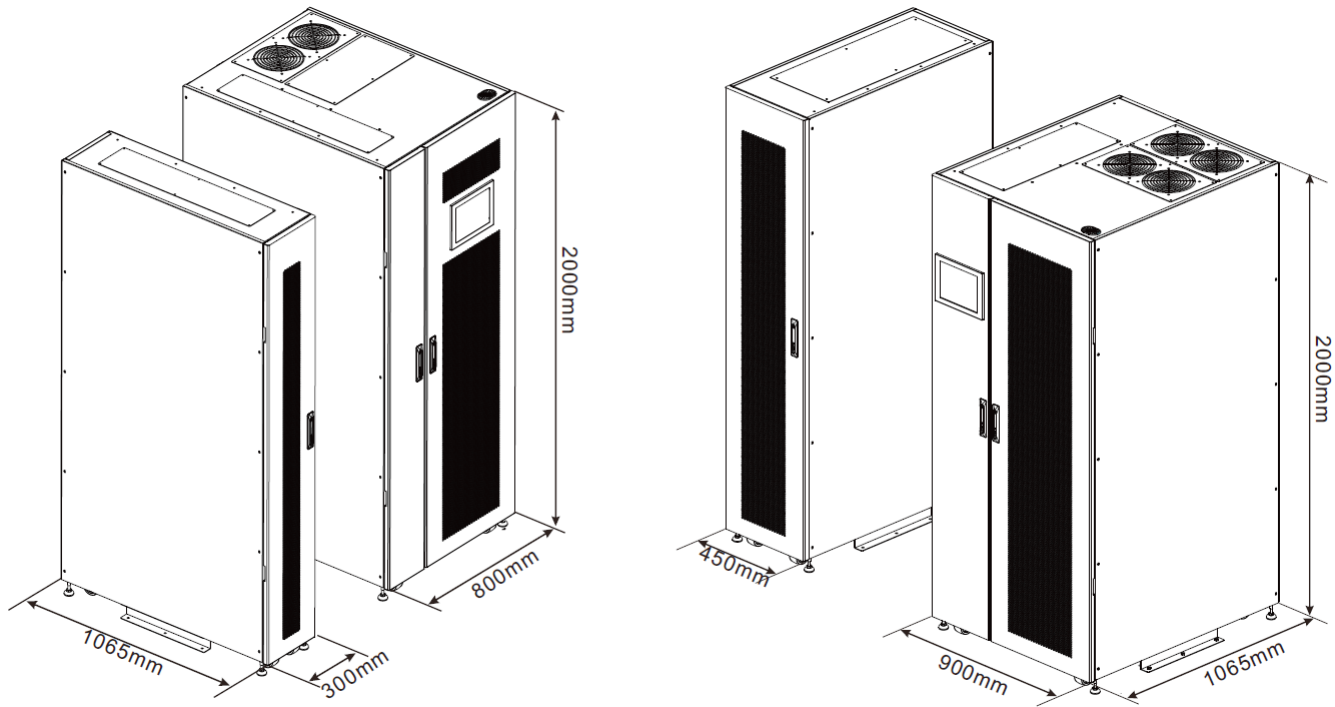
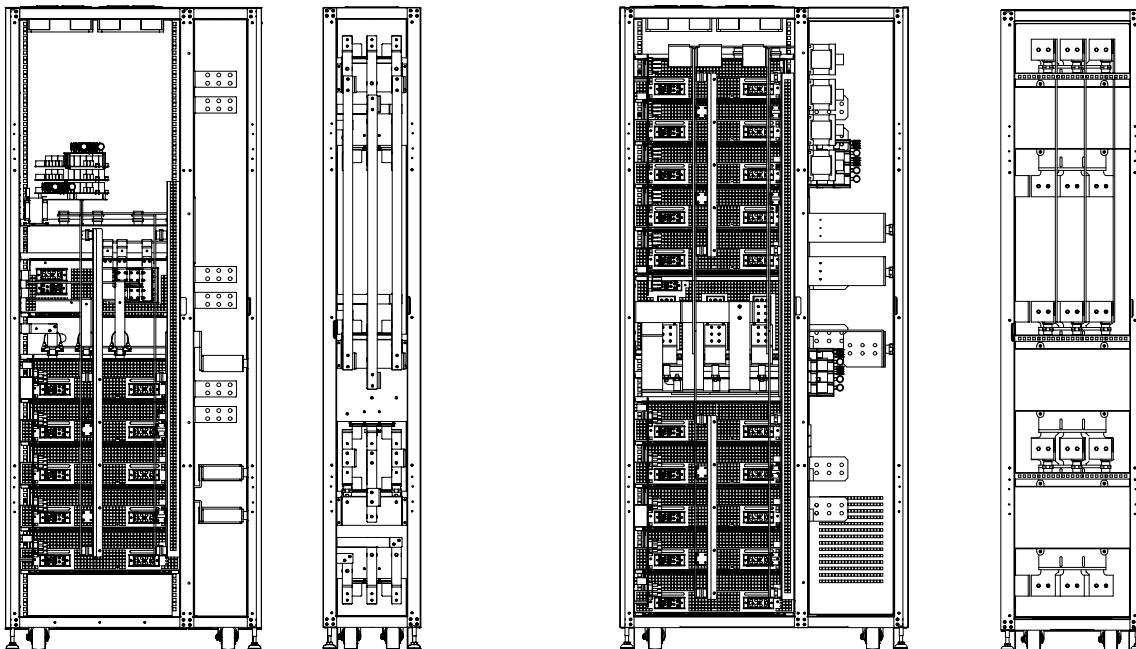


Figure 2-8 Dimensions

2.6.3 Rear View

2.6.3 Rear View



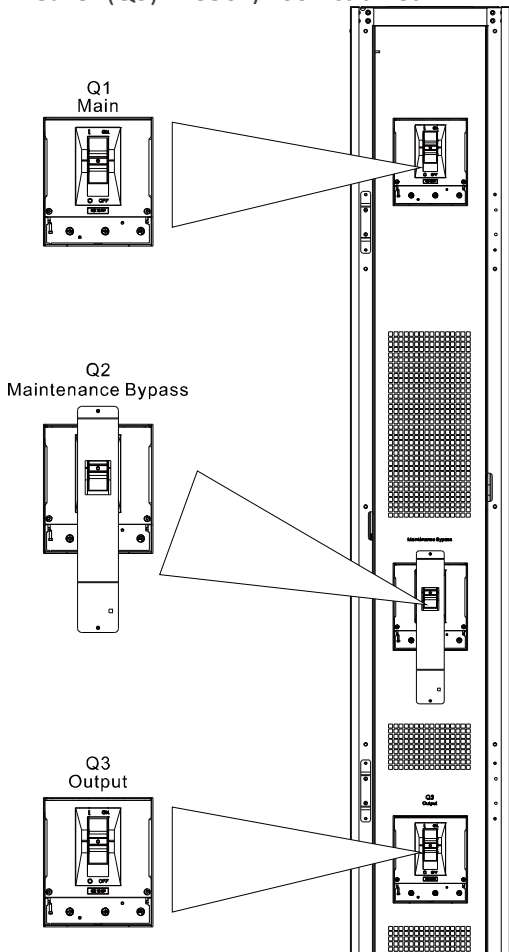
X90-SMB350 / X90-ENC5S

X90-SMB700 / X90-ENC10S

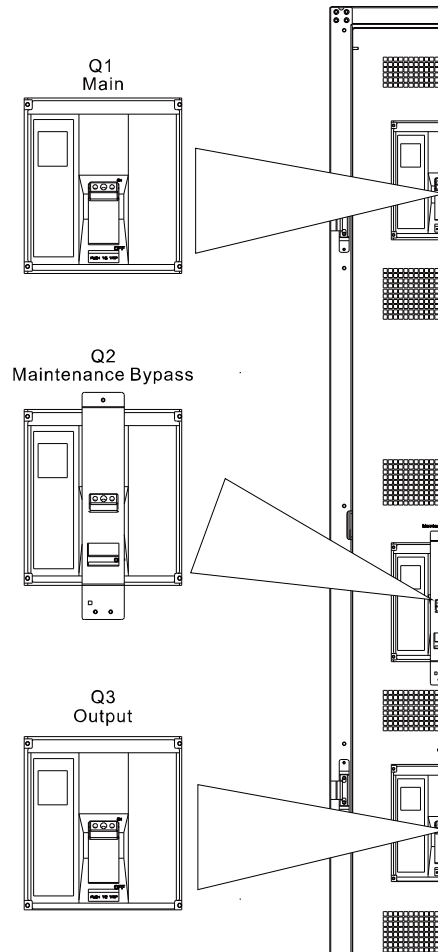
2.7 Internal Mechanisms

2.7.1 Breakers

After opening the front door, there are three breakers, Main Breaker (Q1), Maintenance Breaker (Q2) and Output Breaker (Q3) in 350K/700K cabinet



X90-SMB350

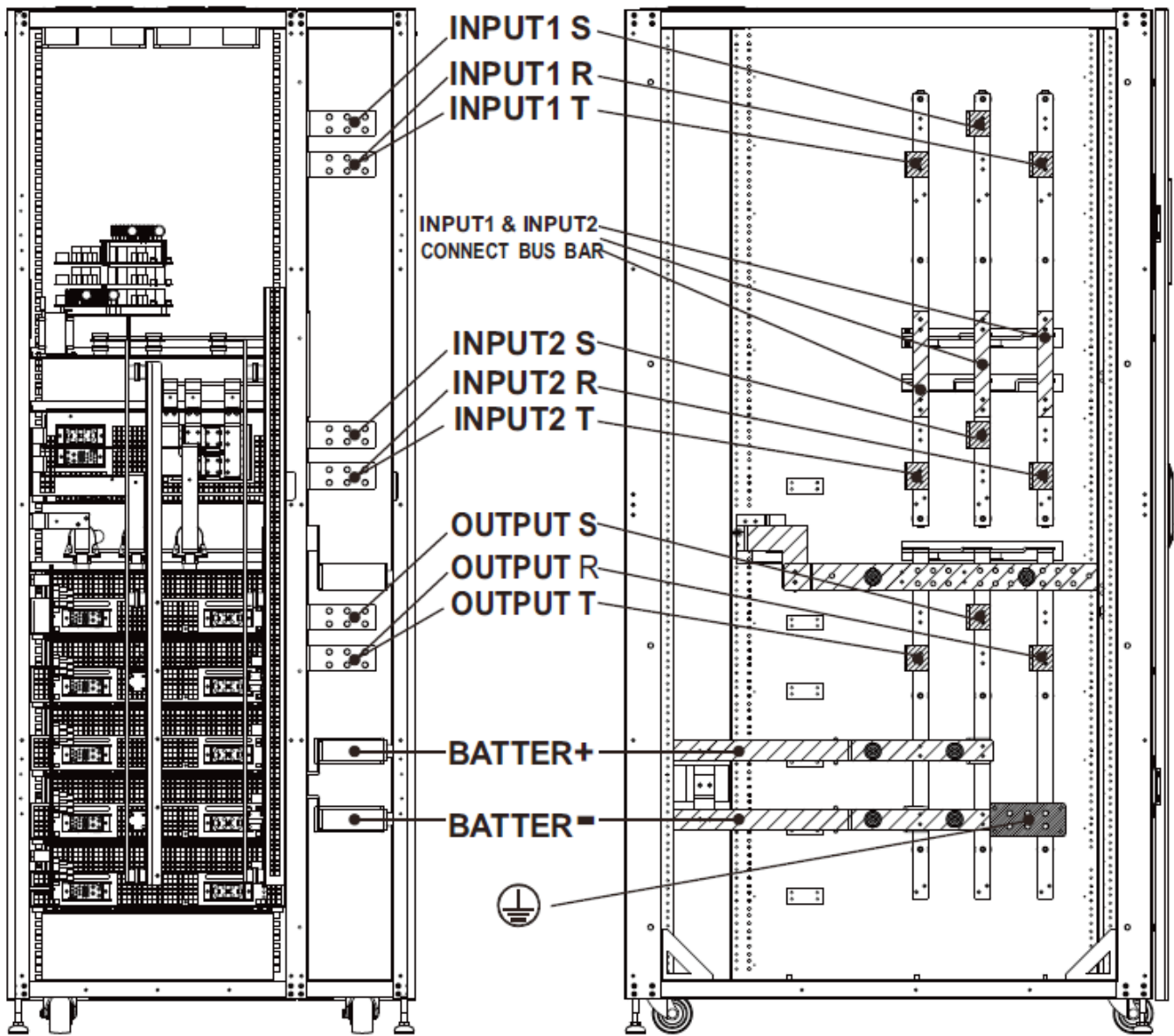


X90-SMB700

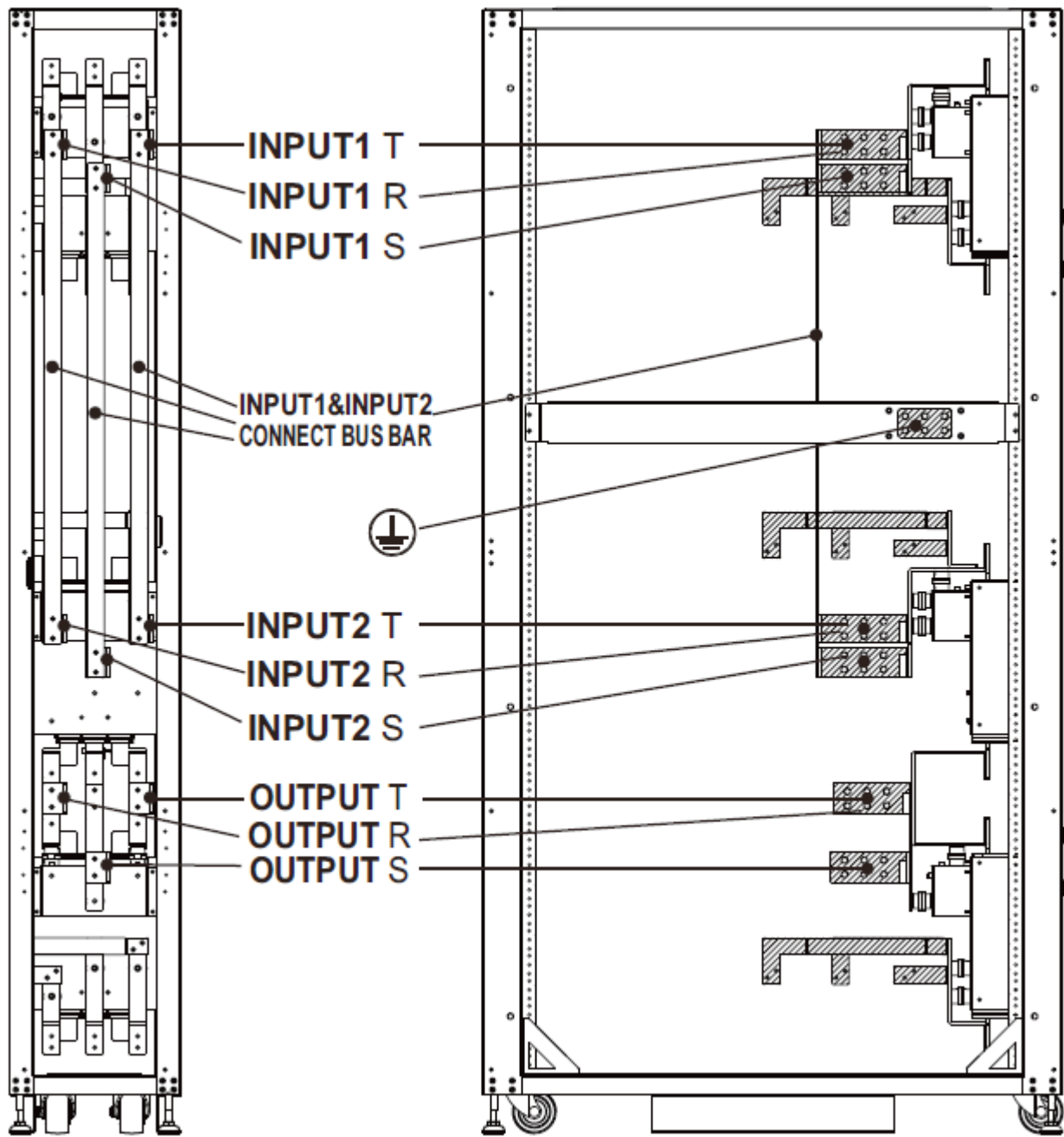
2.7.2 Wiring Terminal Blocks

Open the UPS's back doors and you will see the wiring terminal block. For UPS cabinet wiring, please refer to Figure 2-13.

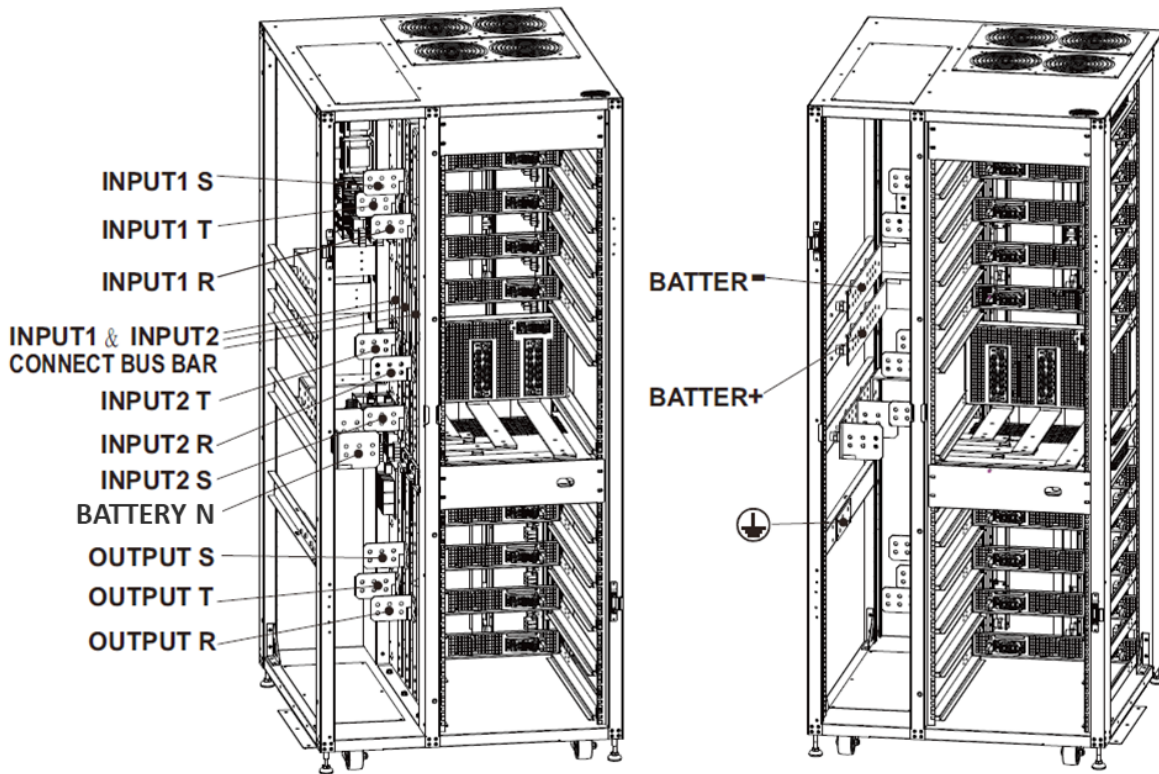
No.	Item	Function	Description
1	Output Block	Connects the critical loads	Includes R, S, T terminals.
2	Bypass Input Block	Connects bypass AC source	Includes R, S, T terminals.
3	Main Input Block	Connects main AC source	Includes R, S, T terminals.
4	For UPS Grounding	For UPS grounding	Includes one grounding terminal.
5	Battery Input Block	Connects an external battery cabinet	Positive (+), Negative (-) and Battery Neutral (N) terminals.



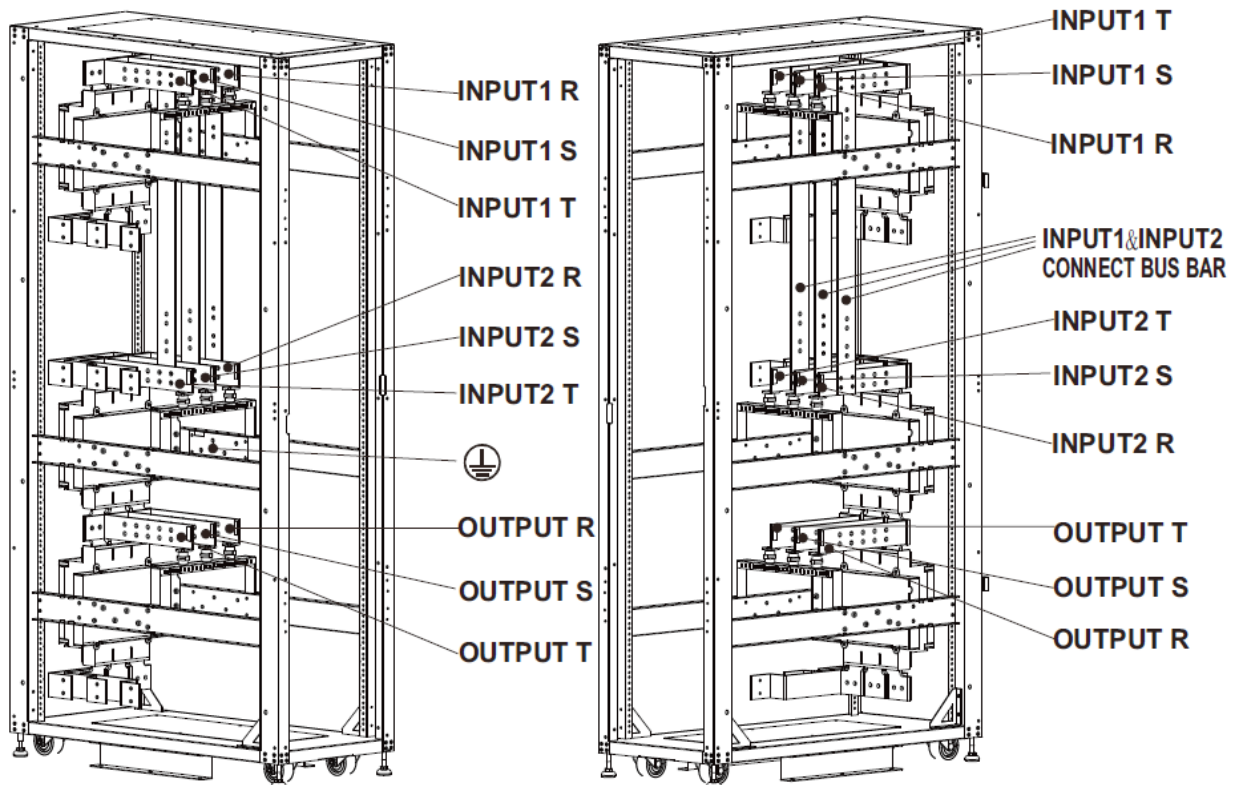
X90-ENC5S



X90 SMB350



X90-ENC10S



X90 SMB350

Figure 2-13 Terminal Blocks

2.7.3 EMI solution

To meet EMI requirements, please add EMI core as Figure 2-14.

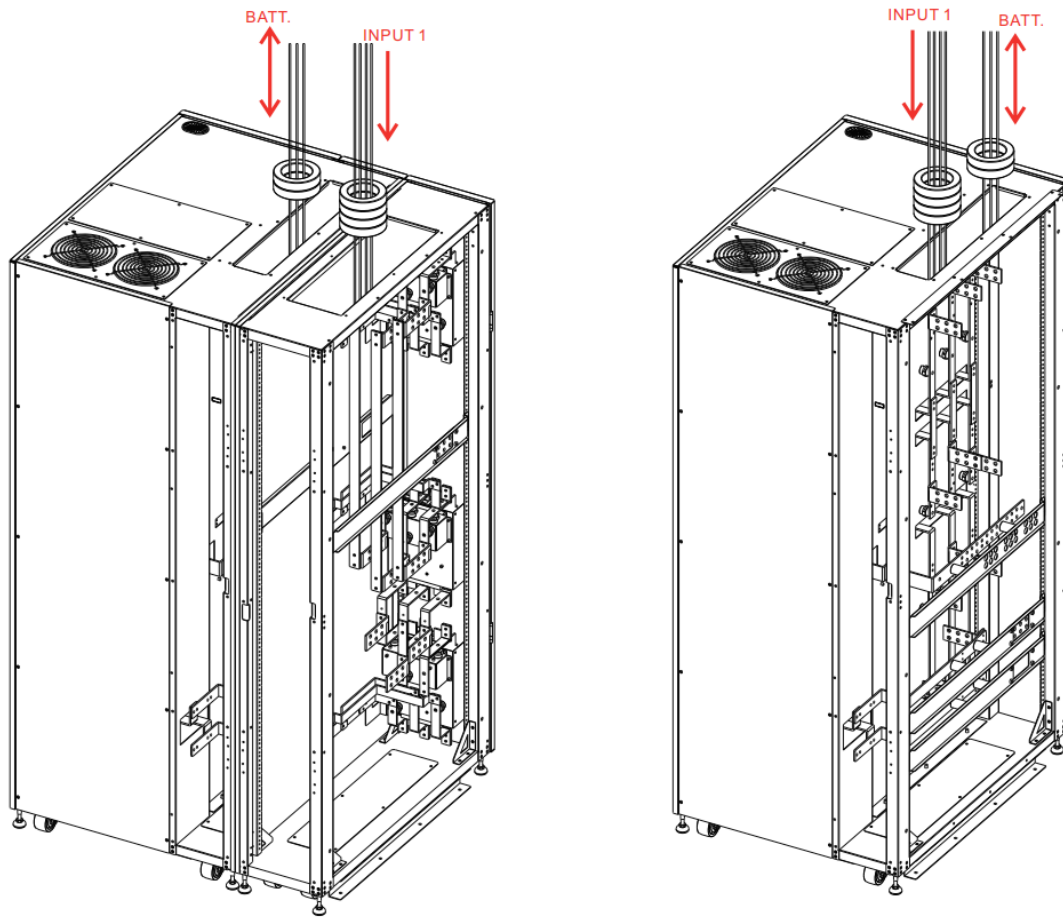


Figure 2-14 EMI core

2.8 Control Panel

2.8.1 LCD Display

Through the touch LCD display, the user can easily understand the operation mode of UPS. In addition, the measurement, parameters, versions of firmware and warnings can be browsed in the friendly interface. For detailed information, please refer to Chapter 4.

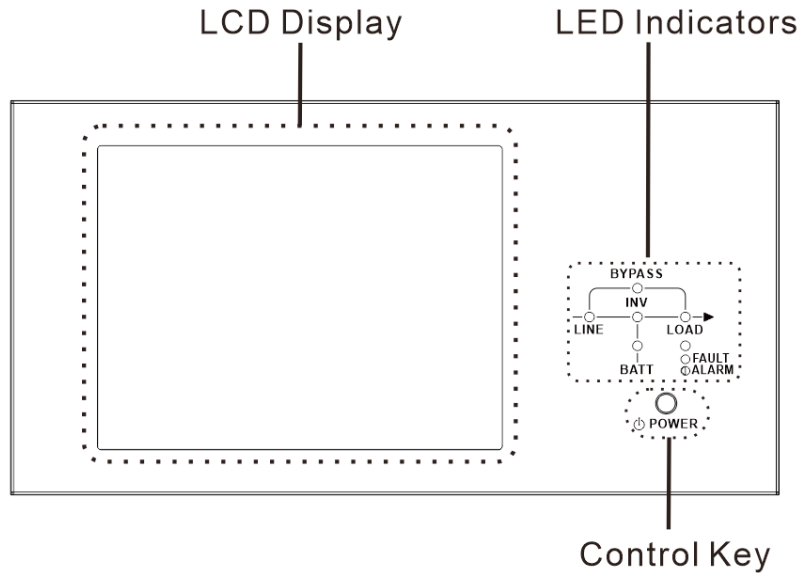


Figure 2-14 Control Panel

2.8.2 LED Indicators

LED	Color	Status	Definition
LINE	Green	On	Input source is normal.
		Flashing	Input source is abnormal.
		Off	No input source
BYPASS	Yellow	On	Load on Bypass.
		Flashing	Input source is abnormal.
		Off	Bypass circuit is not operating.
LOAD	Green	On	There is power output for the load.
		Off	There is no power output for the load.
INV	Green	On	Load on inverters.
		Off	Inverter circuit is not operating.
BATTERY	Red	On	Output power from Battery.
		Flashing	Low battery
		Off	Battery converter is normal and battery is charged.
FAULT/ ALARM	Red	On	UPS fault.
		Flashing	UPS alarm.
		Off	Normal.

2.8.3 Control Key

Turn on or turn off the UPS.

2.9 Introduction of Modules

The design of STS Module and Power Module make maintenance and replacement quickly and easily. The modular and hot-swappable design of Power Module makes it a highly cost-effective solution to meet your power requirement. The number of Power Modules installed in the UPS can be based on the initial needs. Once the power requirement increases, you can easily install more Power Modules without interrupting the operation of the system. Front View is shown in figure 2-9

2.9.1 STS Module

The STS Module is installed before leaving factory. It provides the bypass power when UPS is in Bypass Mode. In addition to offering bypass power, it includes some communication interfaces. For detailed information, please refer to Chapter 5.

No.	Item	Description
1	Extra Comm. Slot	This slot can insert an optional card, Extra Comm. Card. This card can enhance the communication capability of UPS system and provide another SNMP slot and some dry contact ports.
2	LCD Port	This port connects to Control Panel with an installed cable from factory.
3	RS232 port	Local communication interface.
4	USB port	Local communication interface.
5	SNMP Slot	This slot can work with an optional card such as SNMP, AS400 or Modbus card.
6	Dry contact ports	CN1 ~ CN8. For detailed information, please refer to Chapter 5.

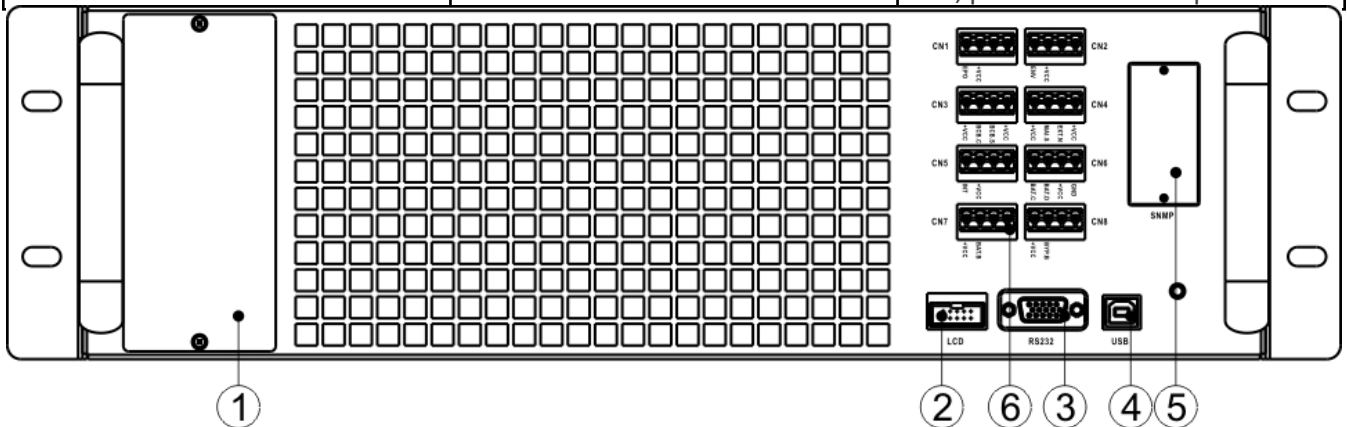


Figure 2-16 STS Module

2.9.2 Power Module

Each Power Module is shipped with its own package. It has to be installed during the UPS system installation. The capacity of each Power Module is 60kVA/60kW. It includes a power factor correction rectifier, a battery charger, an inverter and control circuit.

No.	Item	Description	
1	Fan	The Power Module uses forced convection cooling by these fans. Cooling air enters the module through ventilation grills and exhausted through grills located in the rear of the module. Please do not block the ventilation area.	
2	Ready Switch	Unlock it before removing the Power Module. Lock it when the Power Module is well installed. Then the Power Module can start to work.	
3	DIP Switches	There are three DIP switches for Power Module address setting. In the same cabinet, each Power Module ID MUST be exclusive. The setting method is shown in Table 2-1.	
4	Battery Start Button	When AC input is not existing, use this button to start battery power for UPS.	
5	FAULT LED	ON	The Power Module is in fault condition or the Ready Switch is unlocked.
		ON/OFF 0.5 sec	The Power Module IDs conflict.
		ON/OFF 0.15 sec	The STS Module is not found.
6	RUN LED	ON	The Power Module normally works as a slave module.
		ON/OFF 0.5 sec	The Power Module normally works as a master module.
		ON/OFF 0.15 sec	CAN Bus communication failure.

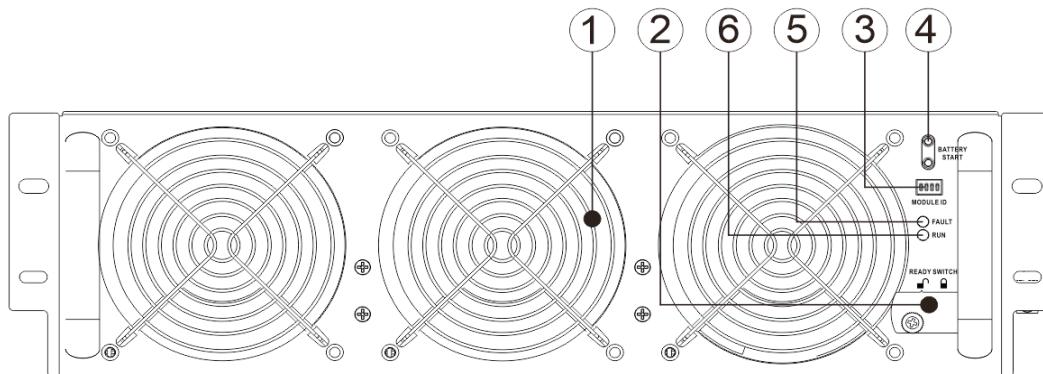


Figure 2-17 Power Module

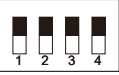

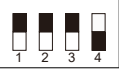
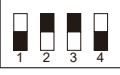
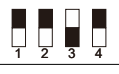
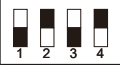
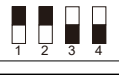
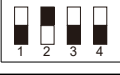



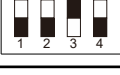


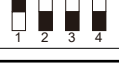
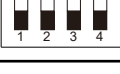
Module Address	DIP SWITCH	Module Address	DIP SWITCH
1		9	
2		10	
3		11	
4		12	
5		13	
6		14	
7		15	
8		15	

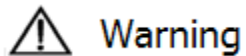
Table 2-1 DIP switch setting and Module Address

Power Module ID Assignment

The Power Module's ID shown in Table 2-1. The DIP switches (#3) are mounted in the front panel as shown in Fig 2-17.

The DIP switch position have been well set before leaving factory. It's not necessary to change it for single UPS (RACK 1) system application.

2.10 Power Cable



Warning

Please follow the local wiring regulations. Follow environmental conditions and refer to IEC60950-1.

2.10.1 AC input and output maximum current and power cable configuration.

For X90-ENC5S cabinet

Power rating	50KVA	100KVA	150KVA	200KVA	250KVA
Current (A)	78.5	157	235.5	314	392.5
Power cable (mm ²)	35	95	240	300	150*2
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M8				

Power rating	70KVA	140KVA	210KVA	280KVA	350KVA
Current (A)	110	220	330	440	550
Power cable (mm ²)	35	95	240	300	150*2
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M8				

For X90-ENC10S cabinet

Power rating	300KVA	350KVA	400KVA	450KVA	500KVA
Current (A)	471	549.5	628	706.5	785
Power cable (mm ²)	35	95	240	300	150*2
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M10				

Power rating	420KVA	490KVA	560KVA	630KVA	700KVA
Current (A)	660	770	916	990	1100
Power cable (mm ²)	185*2	240*2	300*2	185*3	240*3
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M10				

Notice: Installer has to consider the max current and wiring gauge when considering future extension.

2.10.2 DC input maximum current and power cable configuration.

For X90-ENC5S cabinet

Power rating	50KVA	100KVA	150KVA	200KVA	250KVA
Current (A)	78.5	157	235.5	314	392.5
Power cable (mm2)	35	95	240	300	150*2
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M8				

Power rating	70KVA	140KVA	210KVA	280KVA	350KVA
Current (A)	200	400	600	800	1000
Power cable (mm2)	95	240	150 x 2	240*2	185*3
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M8				

For X90-ENC10S cabinet

Power rating	300KVA	350KVA	400KVA	450KVA	500KVA
Current (A)	471	549.5	628	706.5	785
Power cable (mm2)	35	95	240	300	150*2
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M10				

Power rating	420KVA	490KVA	560KVA	630KVA	700KVA
Current (A)	660	770	916	990	1100
Power cable (mm2)	185*2	240*2	300*2	185*3	240*3
Fixation torque force (lb-in)	60	60	60	60	60
Screw size	M10				

NOTE: It is +/- 20pcs battery string

2.11 Wiring

WARNING:

- Before connecting any wire, make sure the AC input and battery power is completely cut off.
- Make sure the breakers, Main Breaker (Q1), Maintenance Breaker (Q2), Output Breaker (Q3) and battery breaker are all in the OFF position.
- Make sure the Maintenance Bypass Switch is in UPS position.
- In order to have good heat dissipation, the power cables MUST come into the cabinet from top of the cabinet. Or the cables will block the cooling ventilation and make the over temperature failure.

2.11.1 Installation Drawing

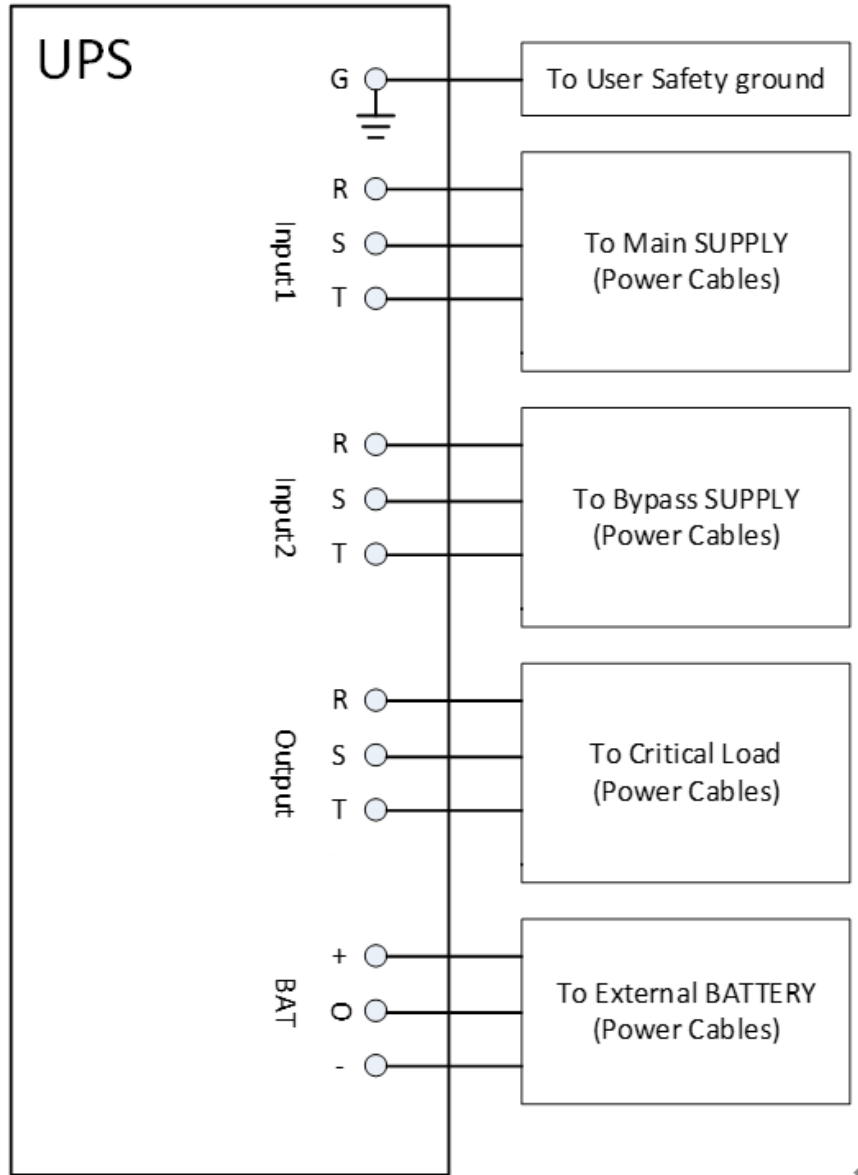


Figure 2-18 UPS Cabinet Wiring (N can not connect)

2.11.2 AC source connection

For **Single input** application, connect Input1 to the AC power source and use 3 short wires to connect Input1 and Input2.

For **Dual input** application, connect Input1 to the Main AC power source and connect Input2 to the Bypass power source.

The sequence of three phase, R, S and T must be connected accordingly. The wrong sequence will alarm a warning when the UPS is powered.

The N must NOT be connected

There is no Breaker between Input 2 and STS Module. The STS module is waked up when Input 2 is powered, although the Q1 Breaker is OFF.

2.11.3 External Battery Cabinet Connection

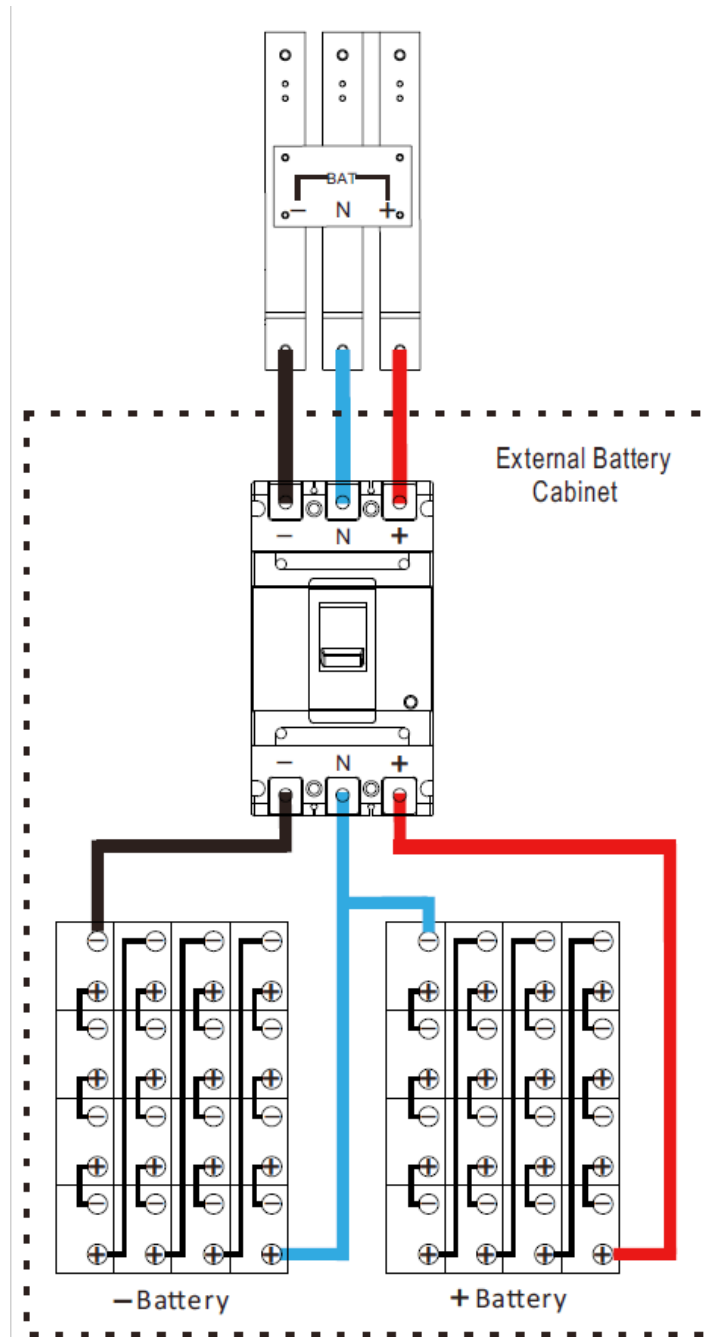
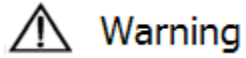


Figure 2-24 External Battery Cabinet Wiring

After the battery is completely installed, be sure to set up nominal battery voltage, battery capacity and maximum charging current in LCD setting. Otherwise, if battery setting is different from actual installation, the UPS will keep warning. Please refer to section 4.2.6.3 and Table 4-9 for the details.

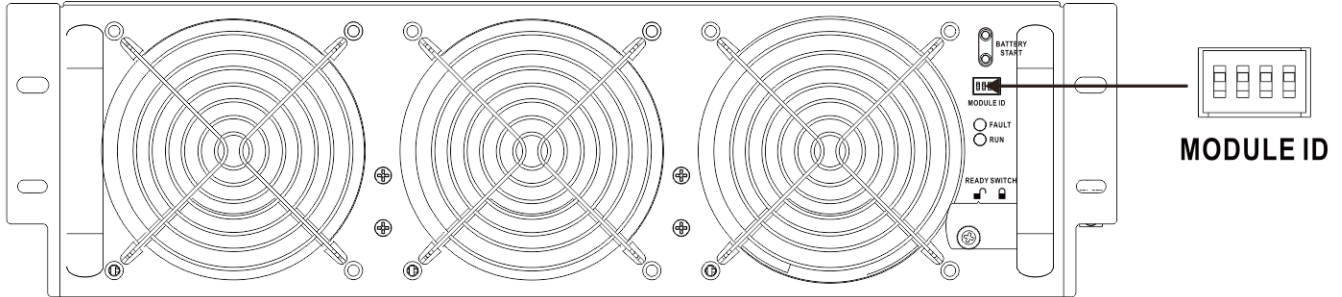
2.12 Power Module Installation



The weight of Power Module is over 30Kg. Therefore, at least two persons are required for handling.

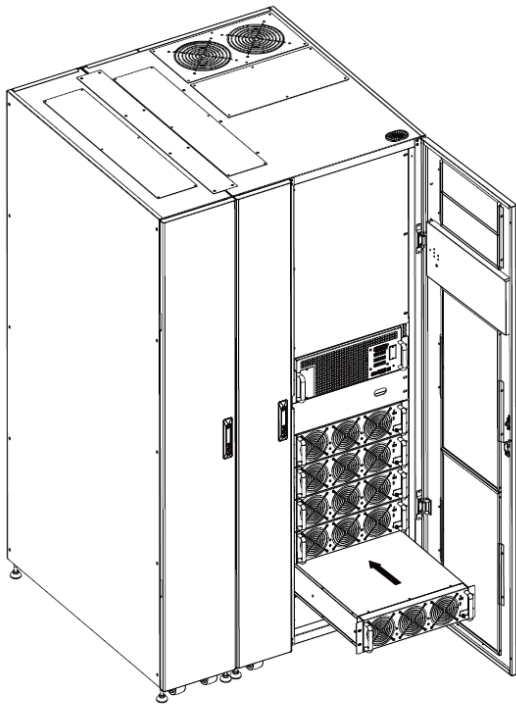
2.12.1 Insert the Power Module

(1.) Adjust the DIP switch positions to set the different Module Address. Refer to Table 2-1.

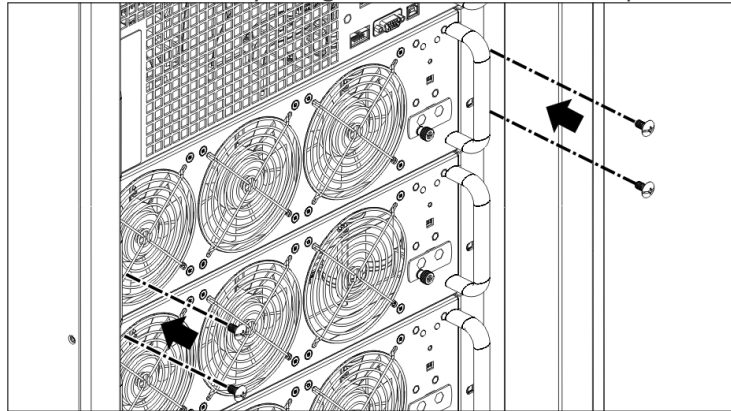


(2.) Switch the ready switch on the front panel of the module to the “ ” position.

(3.) Insert the Power Module into an unoccupied slot by two persons.

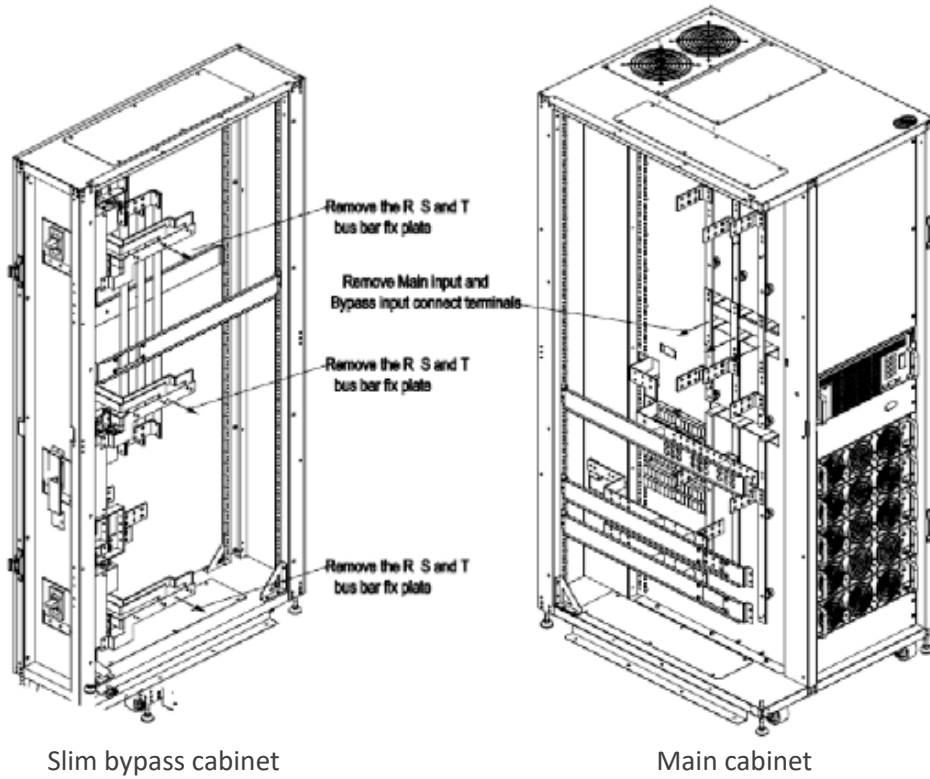


(4.) Secure the Power Module to the cabinet by fixing the screws on the front panel of the Power Module.

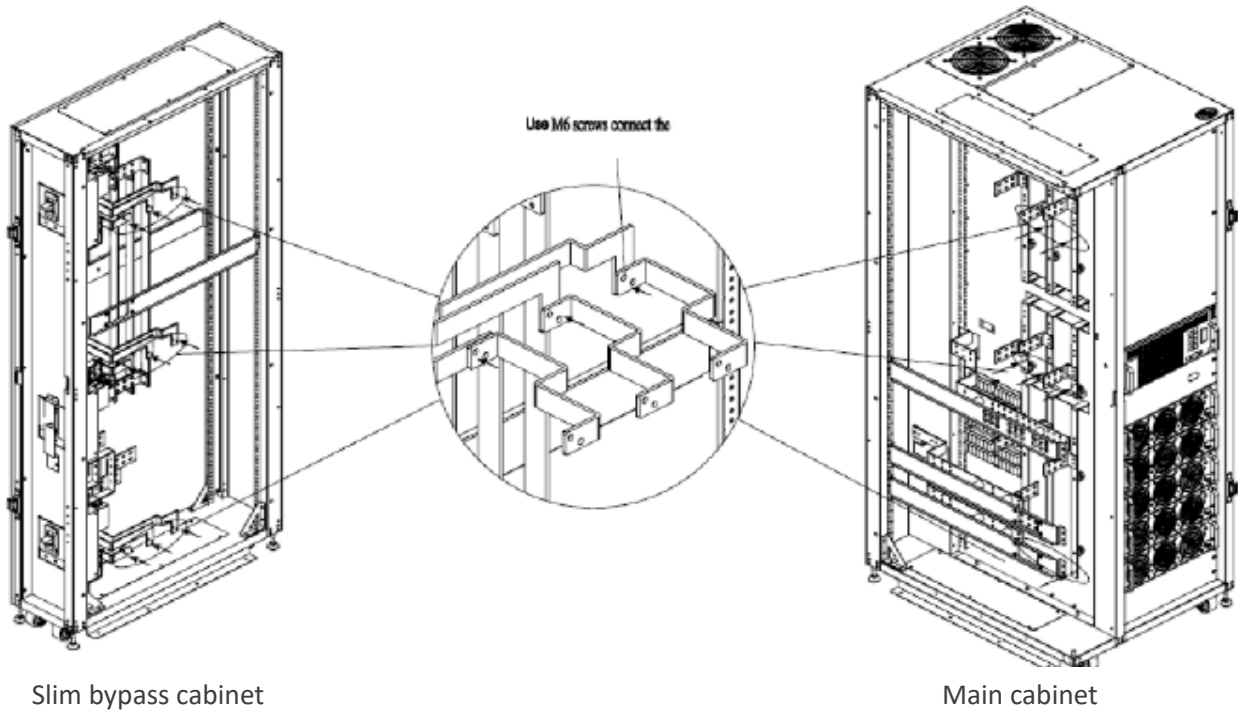


3. SMB Installation

Step 1. Remove bus bars of Main input and Bypass input on Main cabinet. Remove all terminal retaining plates on Slim bypass cabinet



Step 1. Use supplied 9 sets of bus bar to connect main input, bypass and output terminals of slim bypass cabinet and Main cabinet



MODEL NUMBER		X90-5S50k	X90-5S70k	X90-5S100k	X90-5S140k	X90-5S150k	X90-5S200k	X90-5S210k	X90-5S250k	X90-5S280k	X90-5S350k
CAPACITY	Power rating	50kW	70kW	100kW	140kW	150kW	200kW	120kW	250kW	280kW	350kW
CABINET	X90-5S UPS: power modules	Up to 350kW (5 x 70kW) or up to 250kVA (5 x 50kW)									
	X90-BC: battery modules	Up to 36 battery modules									
INPUT	Voltage / frequency nominal	480VAC (3W), 50/60Hz auto-sensing									
	Voltage / frequency range	329 – 520VAC (L-L), 40–70Hz									
OUTPUT	Voltage	480VAC (3W)									
	Frequency	40–70Hz									
	Efficiency	Up to 96.5% online mode or 99% ECO mode									
	Overload capacity	105%-110% for 60min; 110%-125% for 10min; 126%-150% for 1min; >150% for 200ms									
BATTERY SYSTEM	Nominal voltage	+/-240VDC									
	Charge Current (programmable)	18A	36A	54A	72A	90A					
DIMENSIONS & WEIGHTS	UPS & BC enclosure (W x D x H)	31.5 x 42 x 79 in 787 lbs (UPS) / 23.6 x 42 x 79 in 838 lbs (BC)									
	Bypass enclosure (W x D x H)	11.8 x 42 x 79 in / 400 lbs									
	Power & battery module	17.2 x 31.2 x 5.25 in / 104 lbs (PM) 17.2 x 31.2 x 5.25 in / 73 lbs (BM)									
ENVIRONMENT	Temperature	0–40°C (32–104°F)									
	Altitude	5,200 ft above sea level									
	Audible noise (typical)	< 69dBA at 1m									
APPROVALS	UL-1778, cUL, FCC A, RoHS, TAA										
WARRANTY	2 years (USA and Canada)										
COMMUNICATIONS INTERFACE	RS-232, EPO, intelligent slot for optional cards (Web/SNMP, Relay, Modbus)										
INCLUDED IN BOX	User manual, RS-232 cable, unloading ramp, ViewPower Software										
AVAILABLE OPTIONS	External maintenance bypass, battery temperature sensor										

MODEL NUMBER		X90-10S70k	X90-10S140k	X90-10S210k	X90-10S280k	X90-10S350k
CAPACITY	Power rating	70kVA/70kW	140kVA/140kW	210kVA/210kW	280kVA/280kW	350kVA/350kW
MODEL NUMBER		X90-10S420k	X90-10S490k	X90-10S560k	X90-10S630k	X90-10S700k
CAPACITY	Power rating	420kVA/420kW	490kVA/490kW	560kVA/560kW	630kVA/630kW	700kVA/700kW
CABINET	X90-10S UPS: power modules	Up to 700kW (10 x 70kW)				
INPUT	Voltage / frequency nominal	480VAC (3W), 50/60Hz auto-sensing				
	Voltage / frequency range	329 – 520VAC (L-L), 40–70Hz				
OUTPUT	Voltage	480VAC (3W)				
	Frequency	40–70Hz				
	Efficiency	Up to 96.5% online mode or 99% ECO mode				
	Overload capacity	105%-110% for 60min; 110%-125% for 10min; 126%-150% for 1min; >150% for 200ms				
DIMENSIONS & WEIGHTS	UPS enclosure (W x D x H)	35.5 x 42 x 79 in / 787 lbs				
	Bypass enclosure (W x D x H)	17.7 x 42 x 79 in / 524 lbs				
	Power module	17.2 x 31.2 x 5.25 in / 104 lbs				
BATTERY SYSTEM	Nominal voltage	+/-240VDC				
	Charge Current (programmable)	18A (70kW) 108A (420kW)	36A (140kW) 126A (490kW)	54A (210kW) 144A (560kW)	72A (280kW) 162A (630kW)	90A (350kW) 180A (700kW)
ENVIRONMENT	Temperature	0–40°C (32–104°F)				
	Altitude	5,200 ft above sea level				
	Audible noise (typical)	< 69dBA at 1m				
APPROVALS	UL-1778, cUL, FCC A, RoHS, TAA					
WARRANTY	2 years (USA and Canada)					
COMMUNICATIONS INTERFACE	RS-232, EPO, intelligent slot for optional cards (Web/SNMP, Relay, Modbus)					
INCLUDED IN BOX	User manual, RS-232 cable, unloading ramp, ViewPower Software					
AVAILABLE OPTIONS	Matching external maintenance bypass, battery temperature sensor					

Xtreme Power Conversion Limited Warranty

Xtreme Power Conversion (XPC) Corporation warrants Xtreme Power Conversion equipment, when properly applied and operated within specified conditions, against faulty materials or workmanship for a period of **two years for X90-5S & X90-10S Series product** from the date of purchase. XPC Corporation warrants **internal batteries for a period of two years** from the date of purchase. For equipment sites within the United States and Canada, this warranty covers repair or replacement, at the sole discretion of XPC Corporation. The customer is responsible for the costs of shipping the defective product to XPC Corporation. XPC Corporation will pay for ground shipment of the repaired or replacement product. This warranty applies only to the original purchaser.

If equipment provided by XPC Corporation is found to be **Dead-on-Arrival (DOA)**, the customer must request and received a **Return Material Authorization (RMA)** number. DOA equipment is defined as equipment that does not properly function according to user documentation when initially received and connected in conjunction with proper procedures as shown in the user documentation or via support provided by XPC Corporation personnel or authorized agents.

This warranty shall be void if (a) the equipment is repaired or modified by anyone other than XPC Corporation or a XPC Corporation approved third party; (b) the equipment is damaged by the customer, is improperly used or stored, is subjected to an adverse operating environment, or is operated outside the limits of its electrical specifications; or (c) the equipment has been used or stored in a manner contrary to the equipment's operating manual, intended use or other written instructions. Any technical advice furnished by XPC Corporation or a XPC Corporation authorized representative before or after delivery with regard to the use or application of Xtreme Power Conversion equipment is furnished on the basis that it represents XPC Corporations best judgment under the situation and circumstances, but it is used at the recipient's sole risk.

EXCEPT AS STATED ABOVE, XPC Corporation DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS STATED ABOVE, IN NO EVENT WILL XPC Corporation BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF Xtreme Power Conversion EQUIPMENT, including but not limited to, any costs, lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, cost of substitutes, or claims by third parties. Purchaser's sole and exclusive remedy for breach of any warranty, expressed or implied, concerning Xtreme Power Conversion equipment, and the only obligation of XPC Corporation under this warranty, shall be the repair or replacement of defective equipment, components, or parts; or, at XPC Corporations sole discretion, refund of the purchase price or substitution of an equivalent replacement product.

Obtaining Service

If the UPS requires Service:

1. Use the TROUBLESHOOTING section in this manual to eliminate obvious causes.
2. Verify there are no circuit breakers tripped.
3. Call your dealer for assistance. If you cannot reach your dealer, or if they cannot resolve the problem, call Xtreme Power Conversion Corp Technical Support at 800.582.4524. Technical support inquiries can also be made at support@xpcc.com. Please have the following information available BEFORE calling the Technical Support Department:
 - Your name and address.
 - The serial number of the unit.
 - Where and when the unit was purchased.
 - All of the model information about your UPS.
 - Any information on the failure, including LED's that may or may not be illuminated.
 - A description of the protected equipment, including model numbers if possible.
 - A technician will ask you for the above information and, if possible, help solve your problem over the phone. In the event that the unit requires factory service, the technician will issue you a Return Material Authorization number (RMA).

If you are returning the UPS to Xtreme Power for service, please follow these procedures:

1. Pack the UPS in its original packaging. If the original packaging is no longer available, ask the Technical Support Technician about obtaining a replacement set of packaging material. It is important to pack the UPS properly in order to avoid damage in transit. Never use Styrofoam beads for a packing material.
2. Include a letter with your name, address, daytime phone number, RMA number, a copy of your original sales receipt, and a brief description of the problem.
3. Mark the RMA number on the outside of all packages. Xtreme Power cannot accept any package without the RMA number marked on the outside of the boxes.
4. Return the UPS by insured, prepaid carrier to the address provided by the Technician.
5. Refer to the Warranty statements in this manual for additional details on what is covered.