CyberPower

3phase UPS User's Manual

OL3T010KERTHDS / OL3T010KERTHD
OL3T015KERTHDS / OL3T015KERTHD
OL3T020KERTHDS / OL3T020KERTHD
OL3T025KERTHDS / OL3T025KERTHD
OL3T030KERTHDS / OL3T030KERTHD
OL3T040KERTHDS / OL3T040KERTHD
OL3T045KERTHD

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

Cyber Power Systems, Inc.
www.cyberpower.com

Ver 1.0.0
K01-0001034-01

重 要 安 全 警 語

本手冊包含重要的操作說明，應遵循安裝並維護 UPS 和電池。請仔細閱讀並遵守所有的安裝指引與警示。安裝前需仔細閱讀本手冊再進行安裝與操作。

注意！ 在本電路工作前請先隔離不斷電系統 (UPS) 電源供應。

注意！ 不得使用在醫療或生命維護設備！ CyberPower 並不銷售產品在生命維護或醫療應用上，任何影響生命維護、醫療應用或病人護理等皆不得使用。

注意！ 為了防止火災或觸電危險，UPS 需安裝在溫度和濕度合理控制下的室內環境。（請參閱規格可接受的溫度和濕度範圍）。

注意！ 為了減少觸電危險，勿取下上蓋。除電池可替換外，內部無其他可供使用者維修的零件。

注意！ 不得使用在水族箱或相關水源設備上！為降低發生火災的風險，任何有潛在水源處皆不得使用，如壓縮機冷凝水會導致機器短路起火。

注意！ 交流輸出電纜使用長度可超過 10 米。

注意！ 電信埠電纜線長度可超過 3 公尺

注意！ 電池有可能會產生相當大的短路電流，所以在對電池進行更換或維修時，請務必採取以下措施，並由經授權的合格專業人員進行維護。

1. 取下身上的手表、戒指、項鍊或其他金屬物品。
2. 使用具有絕緣握把的工具。
3. 更換電池時，請選擇相同型式與數量之電池或電池組。

注意！ 為了防止觸電，在安裝輸入線及輸出線時，請先關閉交流電源及 UPS。並請優先配接安全接地的部分。

注意！ 為了防止火災，在安裝輸入線及輸出線時，請使用正確尺寸的電源線。並由經授權的合格專業人員安裝。

注意！ 為了防止爆炸，請勿將電池丟入火中。

注意！ 不要打開或毀壞電池，釋出的電解液對皮膚和眼睛是有害的。

注意！ 不要阻塞 UPS 前後左右的外殼通風口。

警 告 使 用 者

本產品是在第 2 類環境中供商業和工業使用，為避免擾動產生，可能需要一些安裝限制及額外的措施。

佈 線 及 規 格 說 明

佈線時請遵守一切國家和地方的電力規定，使用線材需取得 BSMI 認可規定之電源線。

Contents

Contents

Safety Precautions

Safety Precautions

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

The Rackmount UPS cannot be put into operation until it is commissioned by engineers approved by the manufacturer (or its agent). Not doing so could result in personnel safety risk, equipment malfunction and invalidation of warranty.

Safety Message Definition

Danger: Serious human injury or even death may be caused, if this requirement is ignored.

Warning: Human injury or equipment damage may be caused, if this requirement is ignored.

Attention: Equipment damage, loss of data or poor performance may be caused, if this requirement is ignored.

Commissioning Engineer: The engineer who installs or operates the equipment should be well trained in electricity and safety and familiar with the operation, debug, and maintenance of the equipment.

Warning Label

The warning label indicates the possibility of human injury or equipment damage, and advises the proper step to avoid the danger. In this manual, there are three types of warning labels as below.

Labels	Description
 **Danger**	• Serious human injury or even death may be caused, if this requirement is ignored.
 **Warning**	• Human injury or equipment damage may be caused, if this requirement is ignored.
 **Attention**	• Equipment damage, loss of data or poor performance may be caused, if this requirement is ignored.

Safety Instruction

Labels	Description
 **Danger**	• Performed only by commissioning engineers. • This UPS is designed for commercial and industrial applications only, and is not intended for any use in life-support devices or system.
 **Warning**	• Read all the warning labels carefully before operation, and follow the instructions.

Safety Precautions

Labels	Description
	• When the system is running, do not touch the surface with this label, to avoid any hurt of scald.
	• ESD sensitive components inside the UPS, anti-ESD measure should be taken before handling.

Move & Install

Labels	Description
 **Danger**	• Keep the equipment away from heat source or air outlets. • In case of fire, use dry powder extinguisher only, any liquid extinguisher can result in electric shock.
 **Warning**	• Do not start the system if any damage or abnormal parts founded. • Contacting the UPS with wet material or hands may be subject to electric shock.
 **Attention**	• Use proper facilities to handle and install the UPS. Shielding shoes, protective clothes and other protective facilities are necessary to avoid injury. • During positioning, keep the UPS way from shock or vibration. • Install the UPS in proper environment, more detail in section 6.2.

Debug & Operate

Labels	Description
 **Danger**	• Make sure the grounding cable is well connected before connecting the power cables, the grounding cable and neutral cable must be in accordance with the local and national codes practice. • Before moving or re-connecting the cables, make sure to cut off all the input power sources, and wait for at least 10 minutes for internal discharge. Use a multi-meter to measure the voltage on terminals and ensure the voltage is lower than 36V before operation.
 **Attention**	• The earth leakage current of load will be carried by RCCB or RCD. • Initial check and inspection should be performed after long time storing of UPS.

Safety Precautions

Maintenance & Replacement

Labels	Description
 **Danger**	• 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 full 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 Safety

Labels	Description
 **Danger**	• All the battery maintenance and servicing procedures involving internal access need special tools or keys and should be carried out only by trained personnel. • When connected together, the battery terminal voltage will exceed 400Vdc 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. • Ambient temperature is a major factor in determining the battery capacity and life. The nominal operating temperature of battery is 20°C. Operating above this temperature will reduce the battery life. Periodically charge the battery according to the battery user manuals to ensure the back-up time of UPS. • Replace the batteries only with the same type and the same number, or it may cause explosion or poor performance.

Safety Precautions

Battery Safety

Labels	Description
 **Danger**	• When connecting the battery, follow the precautions for high-voltage operation before accepting and using the battery, check the appearance the battery. If the package is damaged, or the battery terminal is dirty, corroded or rusted or the shell is broken, deformed or has leakage, replace it with new product. Otherwise, battery capacity reduction, electric leakage or fire may be caused. • Before operating the battery, remove the finger ring, watch, necklace, bracelet and any other metal jewelry • Wear rubber gloves. • Eye protection should be worn to prevent injury from accidental electrical arcs. • Only use tools (e.g. wrench) with insulated handles. • The batteries are very heavy. Please handle and lift the battery with proper method to prevent any human injury or damage to the battery terminal. • Do not decompose, modify or damage the battery. Otherwise, battery short circuit, leakage or even human injury may be caused. • The battery contains sulfuric acid. In normal operation, all the sulfuric acid is attached to the separation board and plate in the battery. However, when the battery case is broken, the acid will leak from the battery. Therefore, be sure to wear a pair of protective glasses, rubber gloves and skirt when operating the battery. Otherwise, you may become blind if acid enters your eyes and your skin may be damaged by the acid. • At the end of battery life, the battery may have internal short circuit, drain of electrolytic and erosion of positive/negative plates. If this condition continues, the battery may have temperature out of control, swell or leak. Be sure to replace the battery before these phenomena happen. • 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.

Disposal

Labels	Description
 **Warning**	• Dispose of used battery according to the local instructions

Chapter 1 Product Introduction

The series rack-mountable/Stand-alone Tower UPS using on-line double conversion design and DSP based digital control. It supplies stable and uninterrupted power for the important load. It can eliminate the power supply surge, instantaneous high/low voltage, harmonic and frequency offset pollution, to provide high quality electrical energy to customers.

1.1 System Configuration

The UPS is configured by the following part: Rectifier, Charger, Inverter, Static Switch and Manual Bypass Switch. One or several battery strings should be installed to provide backup energy once the utility fails. The UPS structure is shown in Fig. 1-1a & Fig. 1-1b.

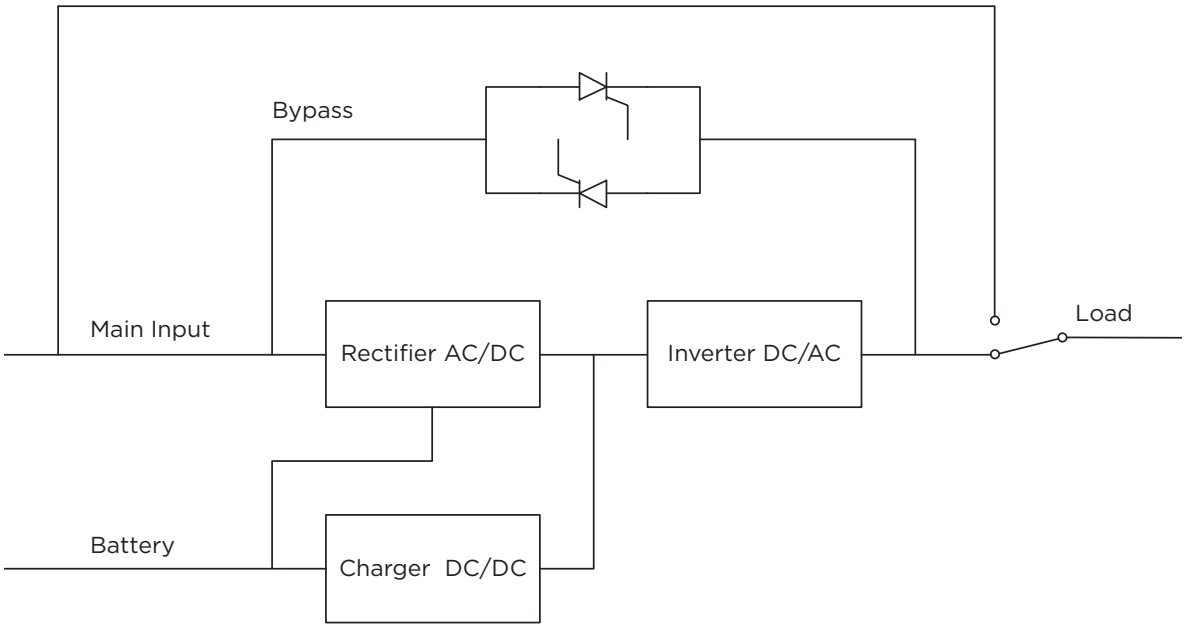


Fig.1-1a UPS Configuration (Stand-alone Tower _ Single input)

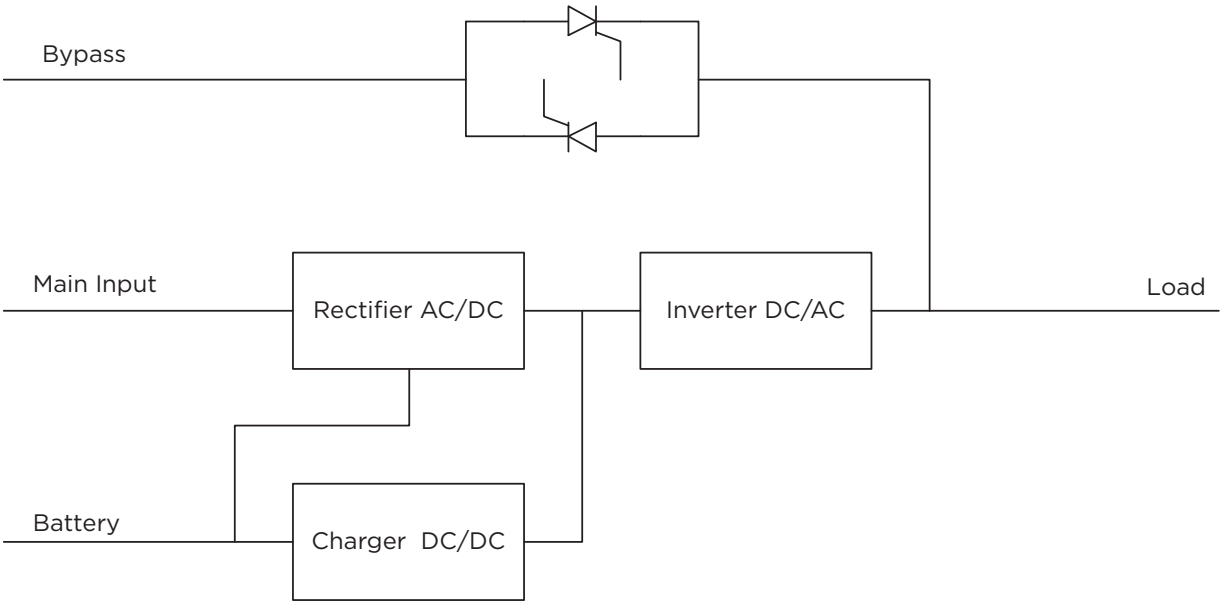


Fig.1-1b UPS Configuration (Rack-mountable _ Dual input)

1.2 Operation Mode

The UPS is an on-line, double-conversion UPS that permits operation in the following modes:

- Line mode
- Battery mode
- Bypass mode
- ECO mode
- Constant Voltage Constant Frequency mode (CVCF mode)

1.2.1 Line Mode

The inverter of power modules continuously supply the critical AC load. The rectifier/charger derives power from the AC mains input source and supplies DC power to the inverter while simultaneously FLOAT or BOOST charging its associated backup battery.

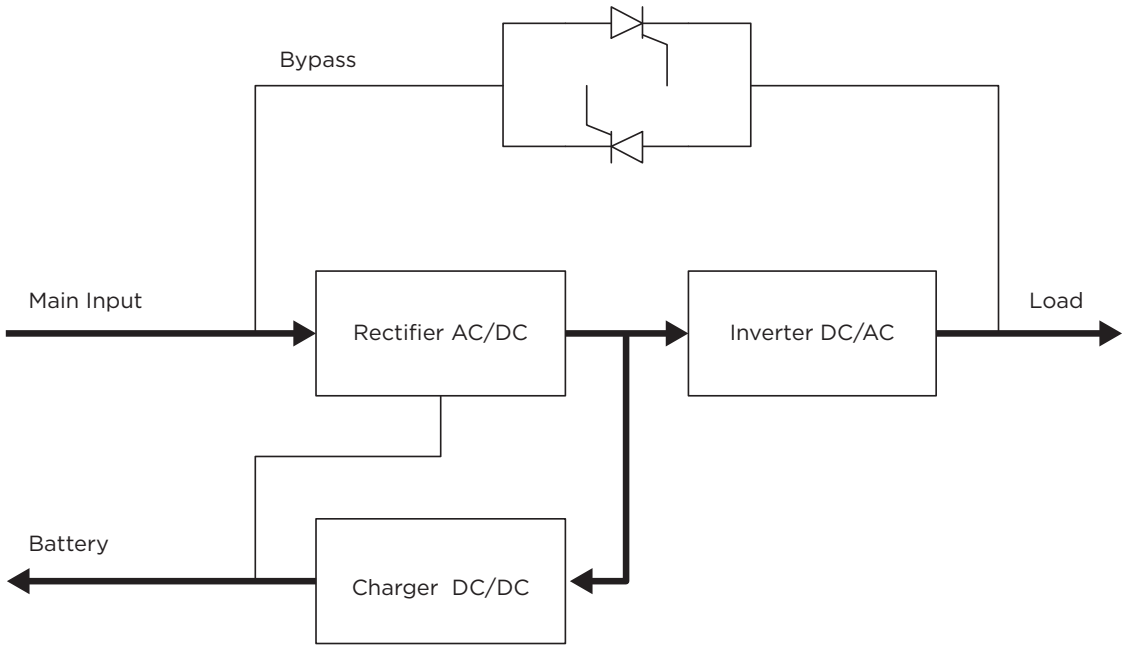


Fig.1-2 Line mode operation diagram

1.2.2 Battery Mode

Upon failure of the AC mains input power, the inverter obtain power from the battery, supply the critical AC load. There is no interruption in power to the critical load upon failure. After restoration of the AC mains input power, the" Line mode" operation will continue automatically without the necessity of user intervention.

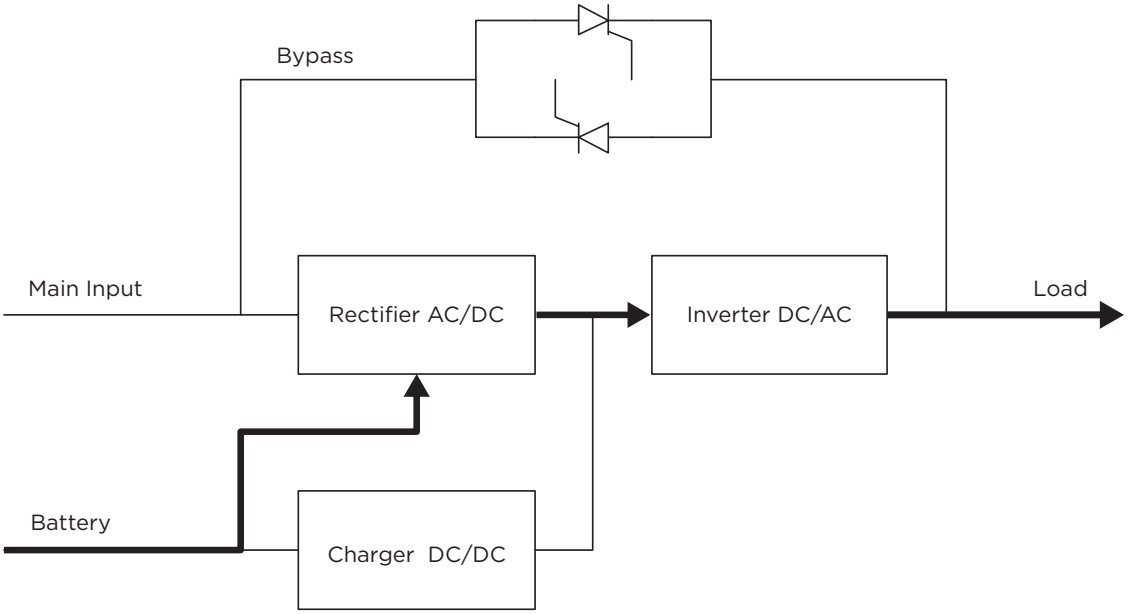


Fig.1-3 Battery mode operation diagram

1.2.3 Bypass Mode

If the inverter overload capacity is exceeded under Line mode, or if the inverter becomes unavailable for any reason, the static transfer switch will perform a transfer of the load from the inverter to the bypass source, with no interruption in power to the critical AC load. Should the inverter be asynchronous with the bypass, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the load. This is to avoid large cross currents due to the paralleling of unsynchronized AC sources. The action of transfer/re-transfer can also be done by the command through monitor.

At the Bypass mode... Battery will be charged when AC Input is as well. The rectifier/charger derives power from the AC mains input source and supplies DC power to the Battery.

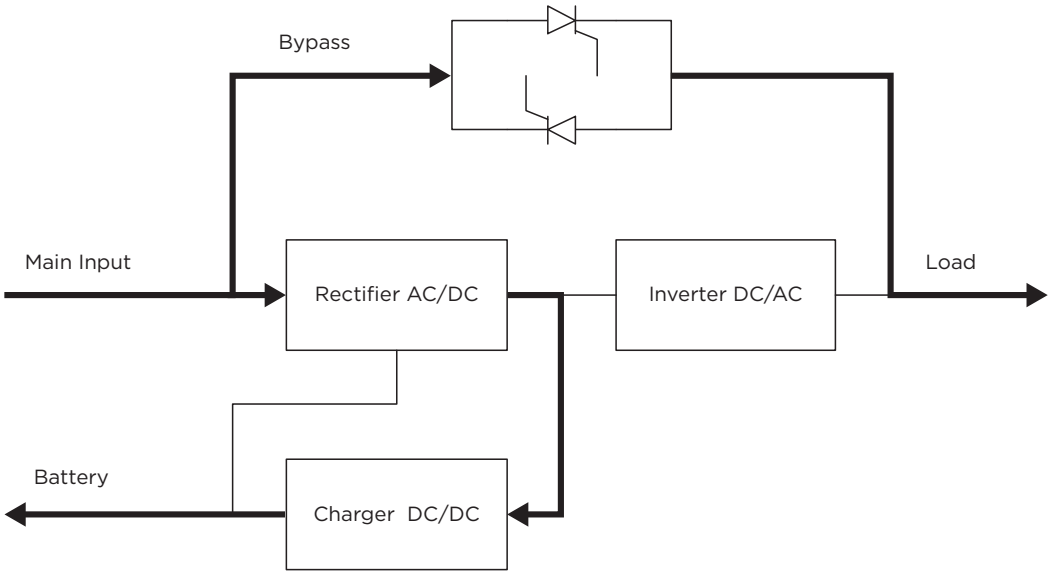


Fig.1-4 Bypass mode operation diagram

Caution:
In case of mains failure or mains voltage is out of range in Bypass mode, the UPS will shut down and stop the output.

1.2.4 ECO Mode

To improve system efficiency, UPS rack system works in Bypass mode at normal time, and inverter is standby. When the utility fails, the UPS transfers to Battery Mode and the inverter provide powers to the loads.

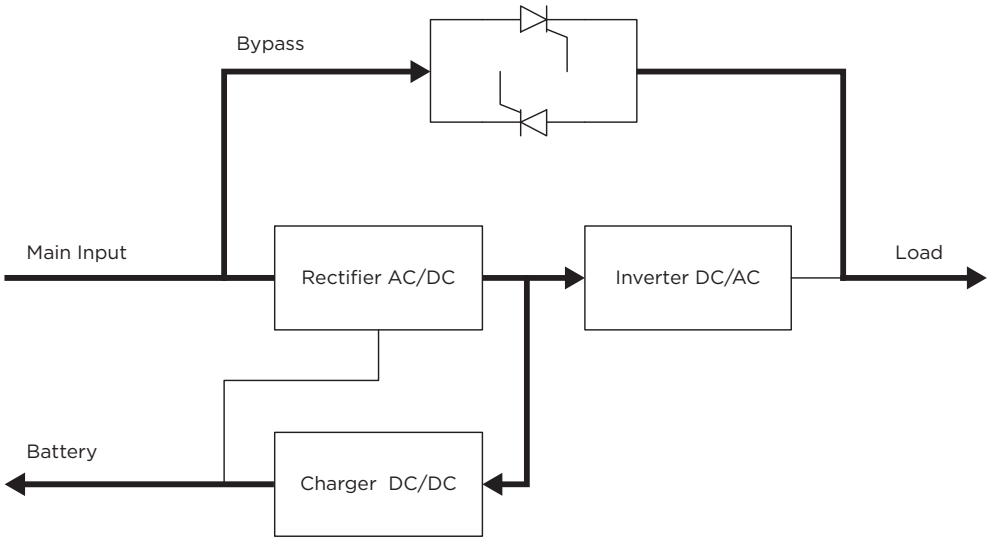


Fig.1-5 ECO Mode operation diagram

Note
There is a short interruption time (less than 10ms) when transfer from ECO mode to battery mode, it must be sure that the interruption has no effect on loads.

1.2.5 Constant Voltage Constant Frequency Mode (CVCF mode)

By setting the UPS to CVCF mode, the UPS could present a stable output of fixed frequency (50 or 60 Hz) or fixed voltage (220 or 230 or 240 V), and the bypass mode is not available.

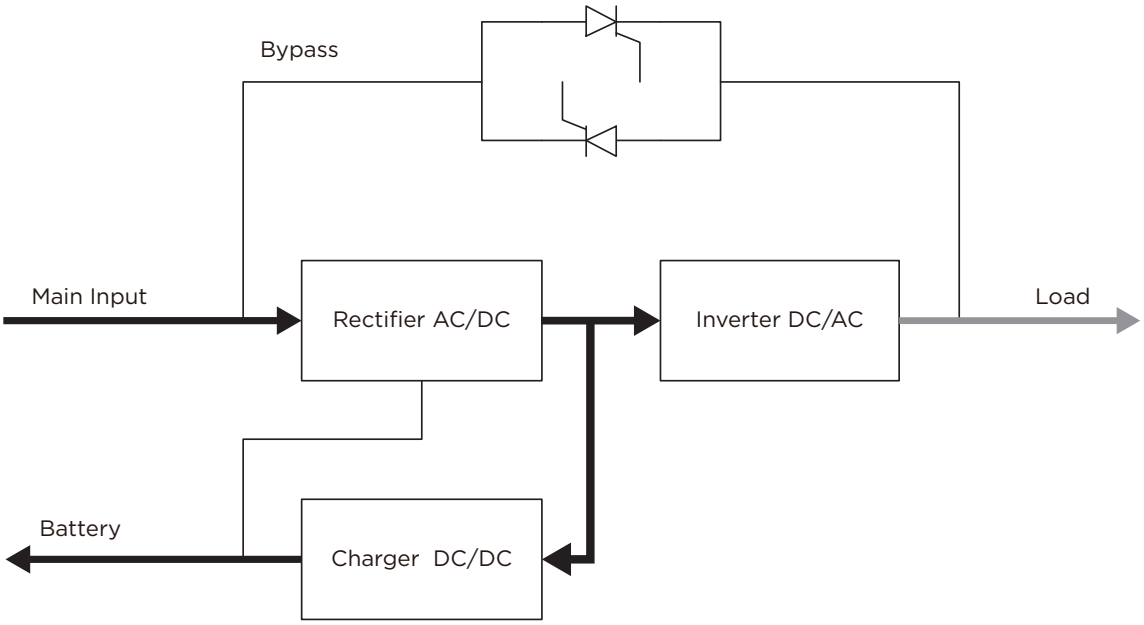


Fig.1-6 CVCF Mode operation diagram

1.3 UPS models and configurations

1.3.1 UPS model

The configuration table for UPS is shown in Table 1.1:
Table 1.1 UPS model table

ITEMS	Cyberpower 10kVA	Cyberpower 15kVA	Cyberpower 20kVA	Cyberpower 25kVA
Model (Single input) Stand-alone Tower	OL3T010KERTHDS	OL3T015KERTHDS	OL3T020KERTHDS	OL3T025KERTHDS
Model (Dual input) Rack-mountable	OL3T010KERTHD	OL3T015KERTHD	OL3T020KERTHD	OL3T025KERTHD

ITEMS	Cyberpower 30kVA	Cyberpower 40kVA	Cyberpower 45kVA
Model (Single input) Stand-alone Tower	OL3T030KERTHDS	OL3T040KERTHDS	N/A
Model (Dual input) Rack-mountable	OL3T030KERTHD	OL3T040KERTHD	OL3T045KERTHD

1.3.2 UPS configuration

The configuration table for UPS is shown in table 1.2:
Table 1.2a UPS configuration table (Stand-alone Tower _ Single input)

Components	Quantity	Remark
Input NFB	1	Standard
Neutral SW	1	Standard
Maintenance SW	1	Standard
Dry Contact	1	Standard
Cold start	1	Standard
Parallel Port	1	Standard
Battery	1	Optional
RMCARD205	1	Optional
Parallel Cable	1	Optional
STACK MOUNTING KIT	1	Optional
VERTICAL MOUNTING KIT	1	Optional

Table 1.2b UPS configuration table (Rack-mountable _ Dual input)

Components	Quantity	Remark
Dry Contact	1	Standard
Cold start	1	Standard
Parallel Port	1	Standard
Battery	1	Optional
RMCARD205	1	Optional
Parallel Cable	1	Optional

1.4 Appearance and Configuration

1.4.1 Appearance

The appearance of the UPS is shown in Fig. 1-7:

Fig.1-7 UPS Outlook

Note:
Non-professionals are forbidden to open the case cover, otherwise there may be an electric shock hazard.

1.4.2 Configuration

Operation display panel:

The UPS front panel unit is shown in Fig.1-7. The operation display panel is located on the front panel of the UPS, providing the LED indicator, the LCD display and the control button. See the "Chapter 3 LCD Panel" for more details.

Rear panel:
As shown in Fig.1-8a & Fig.1-8b, the UPS rear panel offers the following components:

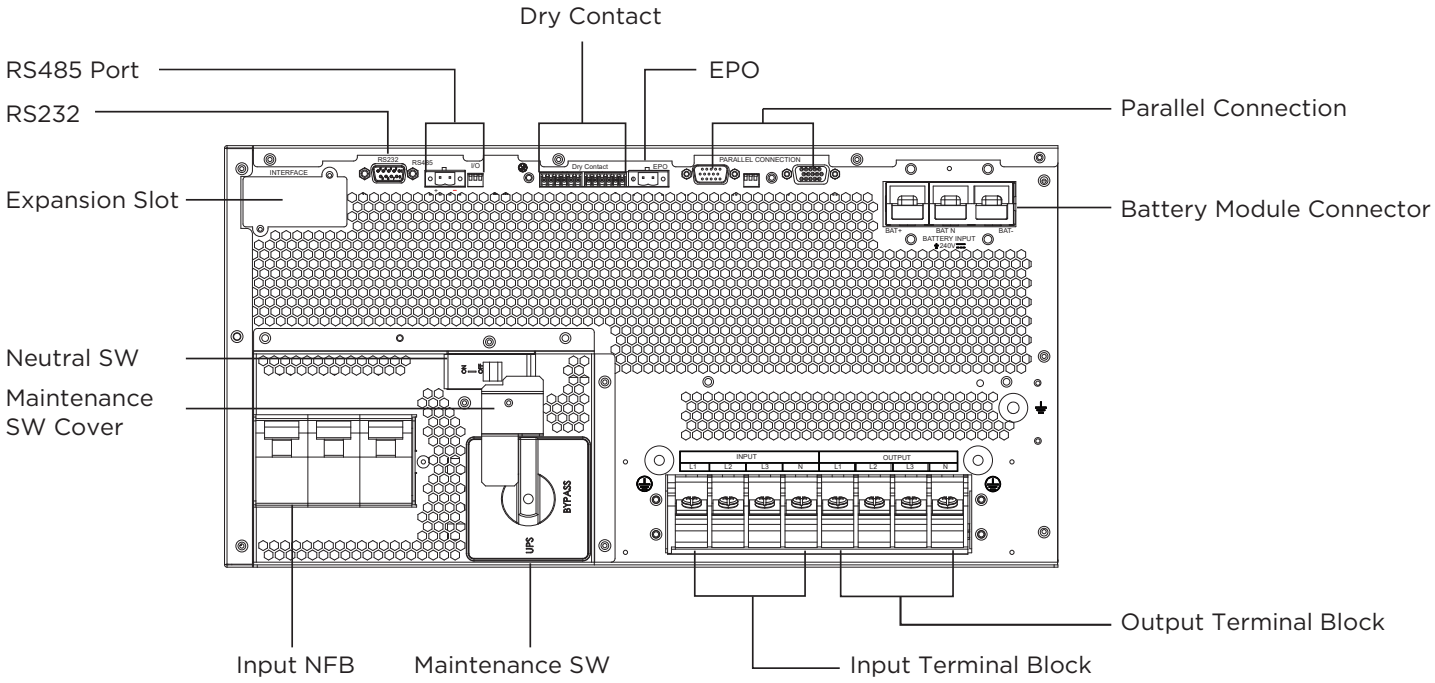


Fig.1-8a UPS configuration table (Stand-alone Tower _Single input)

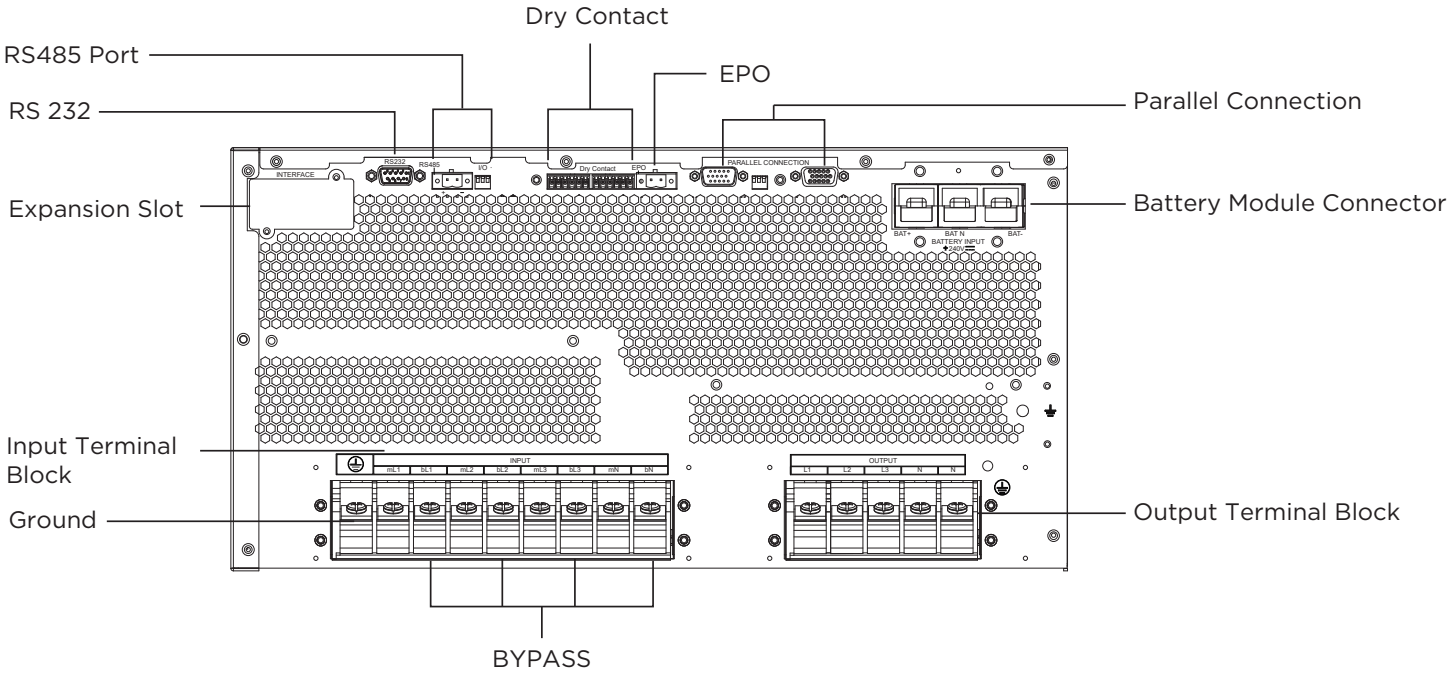


Fig.1-8b UPS configuration table (Rack-mountable _ Dual input)

Table 1.3a UPS rear panel table (Stand-alone Tower _ Single input)

Components	Remark
Expansion Slot	Standard
RS232 Port	Standard
RS485 Port	Standard
Dry Contact	Standard
EPO	Standard
Parallel Connection	Standard
Input Terminal Block	Standard
Output Terminal Block	Standard
Battery Module Connector	Standard
Maintenance SW	Standard
Maintenance SW Cover	Standard
Neutral SW	Standard
Input NFB	Standard

Table 1.3b UPS rear panel table (Rack-mountable _ Dual input)

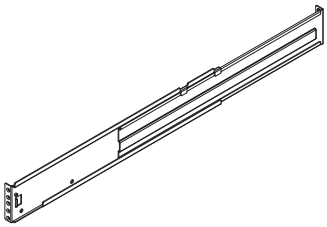
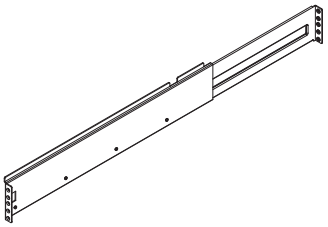
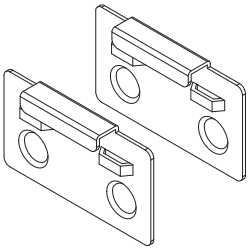
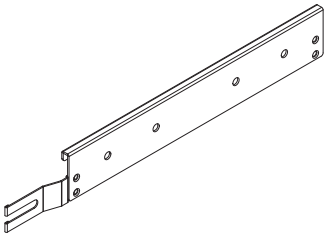
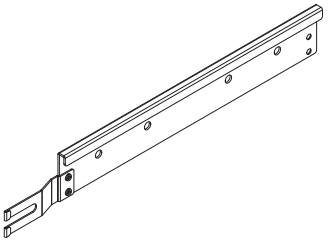
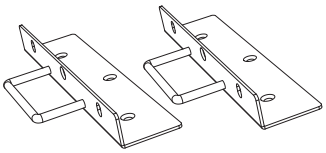
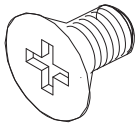
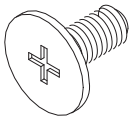
Components	Remark
Expansion Slot	Standard
RS232 Port	Standard
RS485 Port	Standard
Dry Contact	Standard
EPO	Standard
Parallel Connection	Standard
Input Terminal Block	Standard
Output Terminal Block	Standard
Battery Module Connector	Standard
BYPASS Terminal Block	Standard
Ground Terminal Block	Standard

Chapter 2 Installation Instruction

This chapter introduces UPS installation include unpacking and inspection, main Cabinet Installation, cables connection.

2.1 Unpacking and Inspection

1. Unpack the packaging and check the package contents. The shipping package contains:
   - UPS * 1 Unit
   - User manual * 1 Pcs
   - QC Report * 1
   - Rack-mountable(Dual Input) accessory :
     (OL3T010KERTHD / OL3T015KERTHD / OL3T020KERTHD / OL3T025KERTHD / OL3T030KERTHD / OL3T040KERTHD / OL3T045KERTHD)
     - Rack Kit * 1 Set
     - Wiring Cover * 1 Set
     - Battery Cable Connector Set (Housing set * 1 / Contact * 3)

Rack Kit		
 Rackmount left rail	 Rackmount right rail	 hanging bracket (rear)
 Left hanging bracket	 Right hanging bracket	 Rackmount ears
 Flat head screws: M5X7L (14)	 Pan head screws(black): M5X8L (10)	 Guide screws: M5X10L (2)
 Plastic washers (8)		

Chapter 2 Installation Instruction

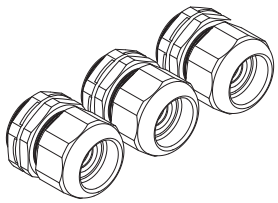
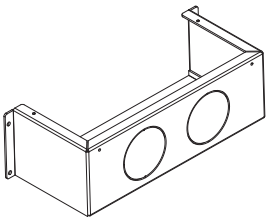
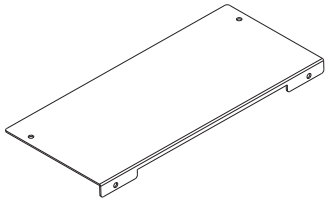
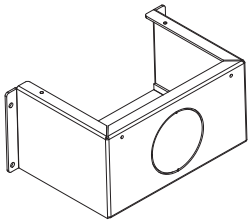
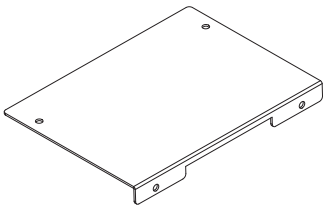
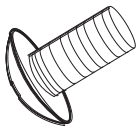
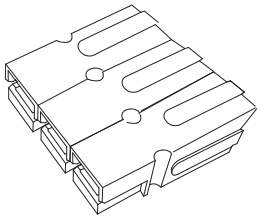
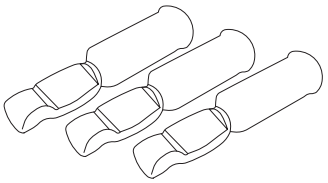
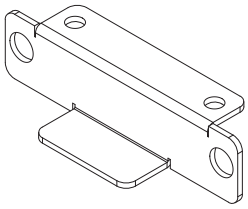
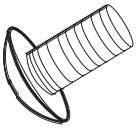
Wiring Cover		
 CABLE GLAND (3)	 TB main box (1)	 TB COVER (1)
 TB main box (1)	 TB COVER (1)	 Truss screws : M3X6L (16)
Battery Cable Connector Set		
 Battery Cable Housing set (1)	 Battery Cable Contact (3)	 Ground wire fixed plate (1)
 Cable tie (1)	 Truss screws : M3X6L (2)	

Fig.2-1a Rack-mountable(Dual Input) accessory

Chapter 2 Installation Instruction

- Stand-alone Tower(Single Input) accessory : (OL3T010KERTHDS / OL3T015KERTHDS / OL3T020KERTHDS / OL3T025KERTHDS / OL3T030KERTHDS / OL3T040KERTHDS)
  - Tower Assembly Accessory Kit * 1 Set
  - Wiring Cover * 1 Set
  - Battery Cable Connector Set (Housing set * 1 / Contact * 3)

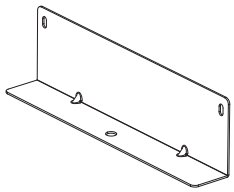
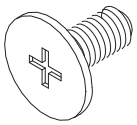
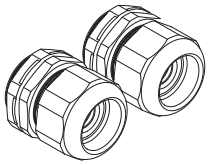
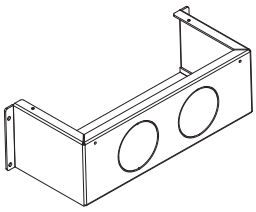
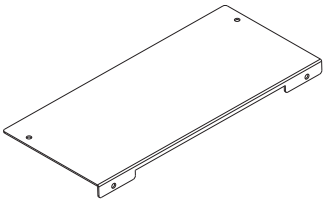
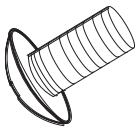
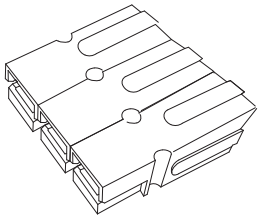
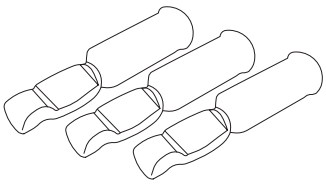
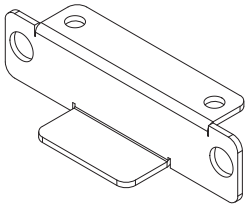
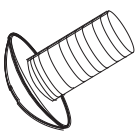
Tower Assembly Accessory Kit		
 Stands (2)	 Pan head screws:M5X8L (4)	
Wiring Cover		
 CABLE GLAND (2)	 TB main box (1)	 TB COVER (1)
 Truss screws : M3X6L (8)		
Battery Cable Connector Set		
 Battery Cable Housing set (1)	 Battery Cable Contact (3)	 Ground wire fixed plate (1)
 Cable tie (1)	 Truss screws : M3X6L (2)	

Fig.2-1b Stand-alone Tower(Single Input) accessory

2. Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts.

Chapter 2 Installation Instruction

2.2 Notes for Installation

1. The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
2. Ensure the air vents on the front and rear of the UPS are not blocked. Allow at least 0.5m of space on each side.
3. Condensation to water drops may occur if the UPS is unpacked in a very low temperature environment. In this case it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use. Otherwise there are hazards of electric shock.

⚠	**NOTICE:** UPS operation in sustained temperature outside the range of 15-25°C (59-77°C) reduces battery life.

2.3 Main Cabinet Installation

CyberPower UPS systems can be installed in a rackmount or Stand-alone Tower orientation. This versatility is especially important to growing organizations with changing needs that value having the option to position a UPS on the floor or in a rackmount system. Note that the included rack mounting hardware is only compatible with square hole racks. Please follow the instructions below for the respective mounting methods.

RACKMOUNT INSTALLATION FOR 4-POST RACK

Dual Input type: (OL3T010KERTHD / OL3T015KERTHD / OL3T020KERTHD / OL3T025KERTHD / OL3T030KERTHD / OL3T040KERTHD/OL3T045KERTHD)

⚠	**Caution:** Important Instructions

Step 1: Rackmount ears & hanging brackets installation

Attach two rackmount ears to the UPS using the provided M5X7L*6pcs screws and tighten two hanging brackets (rear) , with the M5X7L*8pcs screws.

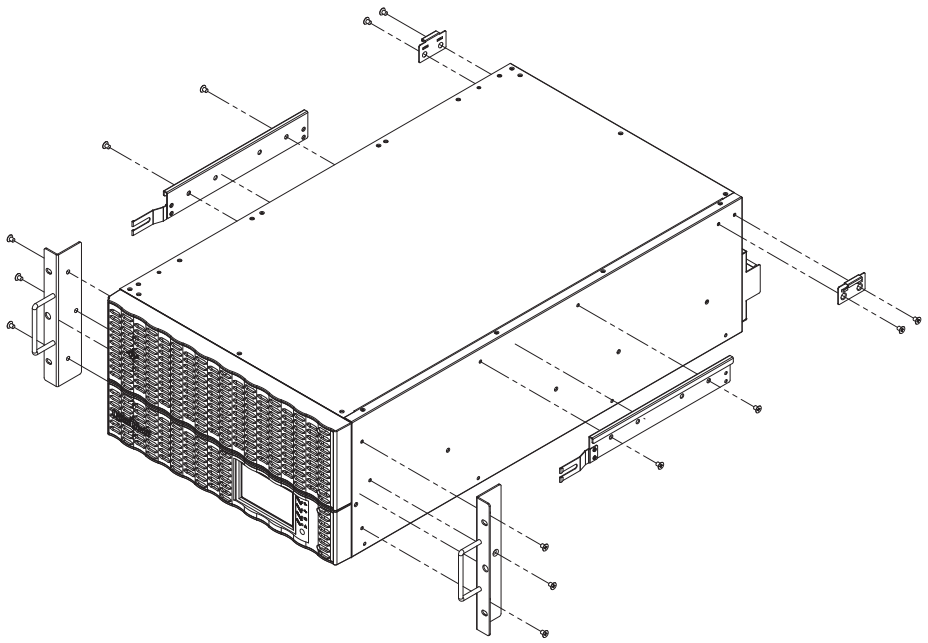


Fig.2-2 Rack Mount ears & hanging brackets installation

Chapter 2 Installation Instruction

Step 2: Rackmount rail Installation

The rails adjust to mount in 48-cm (19-inch) panel racks from 52 to 91.5cm (20.5 to 36 inches) deep. Select the proper holes in the rack for positioning the UPS in the rack. The UPS takes up position 1 through 6

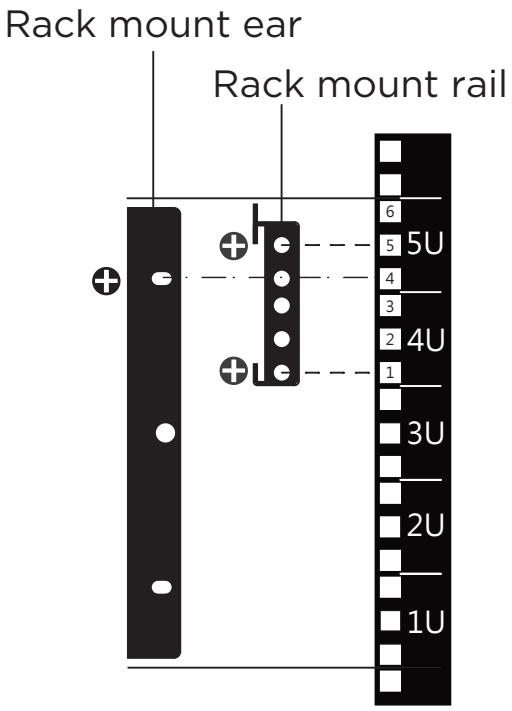


Fig.2-3 Rackmount rail Installation

Position the guide screws on the back of the rackmount rails into the rear rack square holes to temporarily support the rails in place.

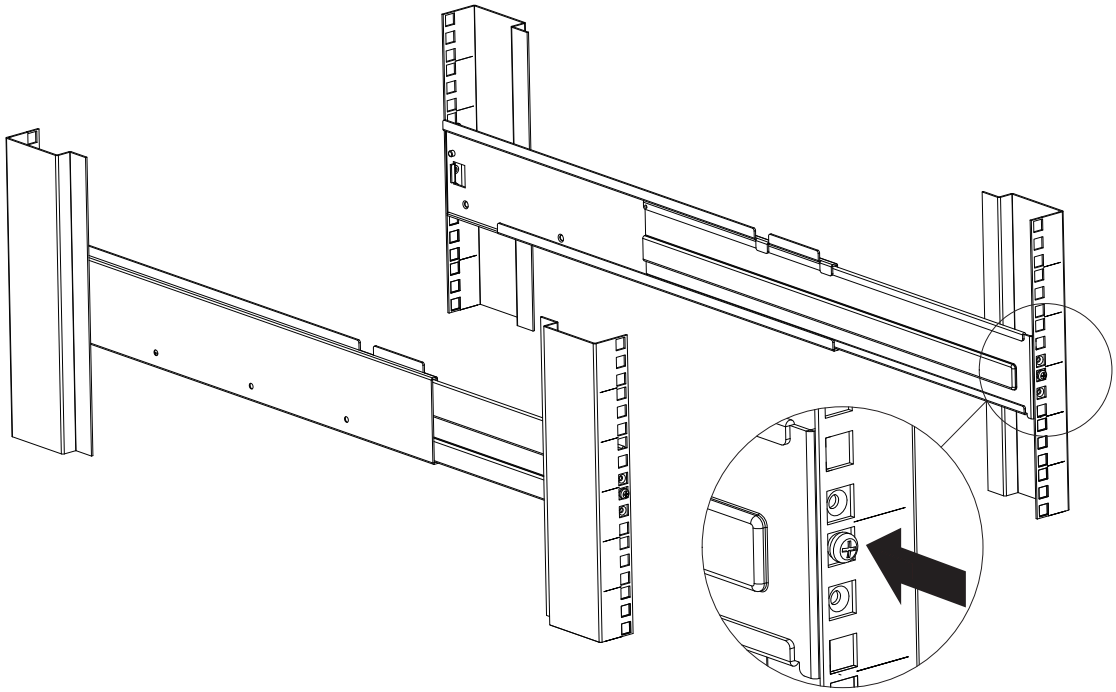


Fig.2-4 Rackmount rail Installation

Step 3: Adjust rackmount rails to fit your rack

Adjust the rail depth to match your rack depth. Attach each rackmount rail to your rack with two black M5X8L pan head screws and two plastic washers at the front of the rack (square holes 1 and 5 as shown below). Secure each rail to the rear of the rack with two black M5X8L pan head screws and two plastic washers.

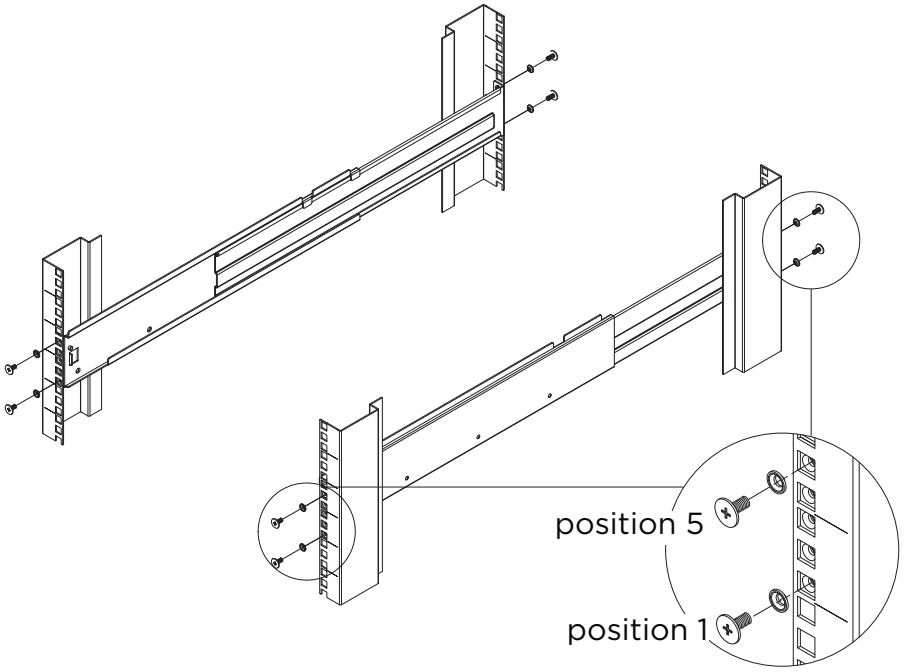


Fig.2-5 Rackmount rail Installation

Step 4: Place and secure the UPS on the rails

Slide the hanging brackets on the UPS on to the rails mounted in the rack with the front of the unit facing toward you. Secure the UPS to your rack with four black M5X8L pan head screws at the front of the rack (square holes 4 as shown below)

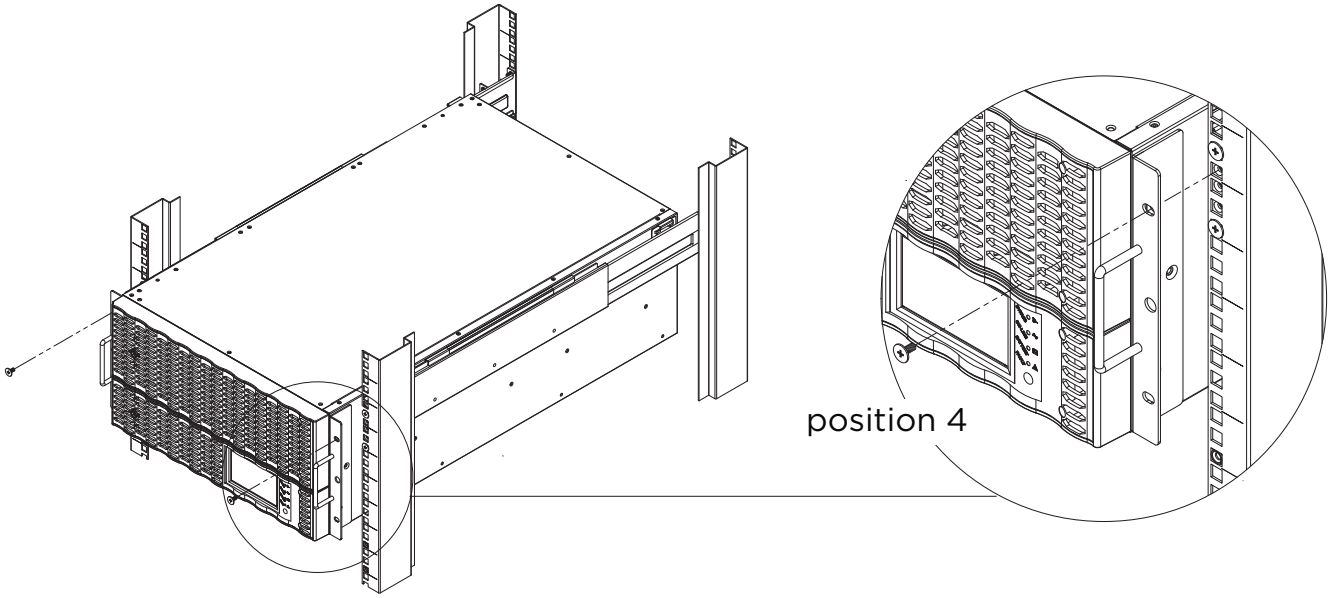


Fig.2-6 Rackmount rail Installation

NOTE: To slide the UPS out from the rack

Chapter 2 Installation Instruction

The UPS will be secured by a safety locking mechanism midway of pulling it out of the rack. Use both hands to hold the UPS and press the safety locking tab to pull the UPS out

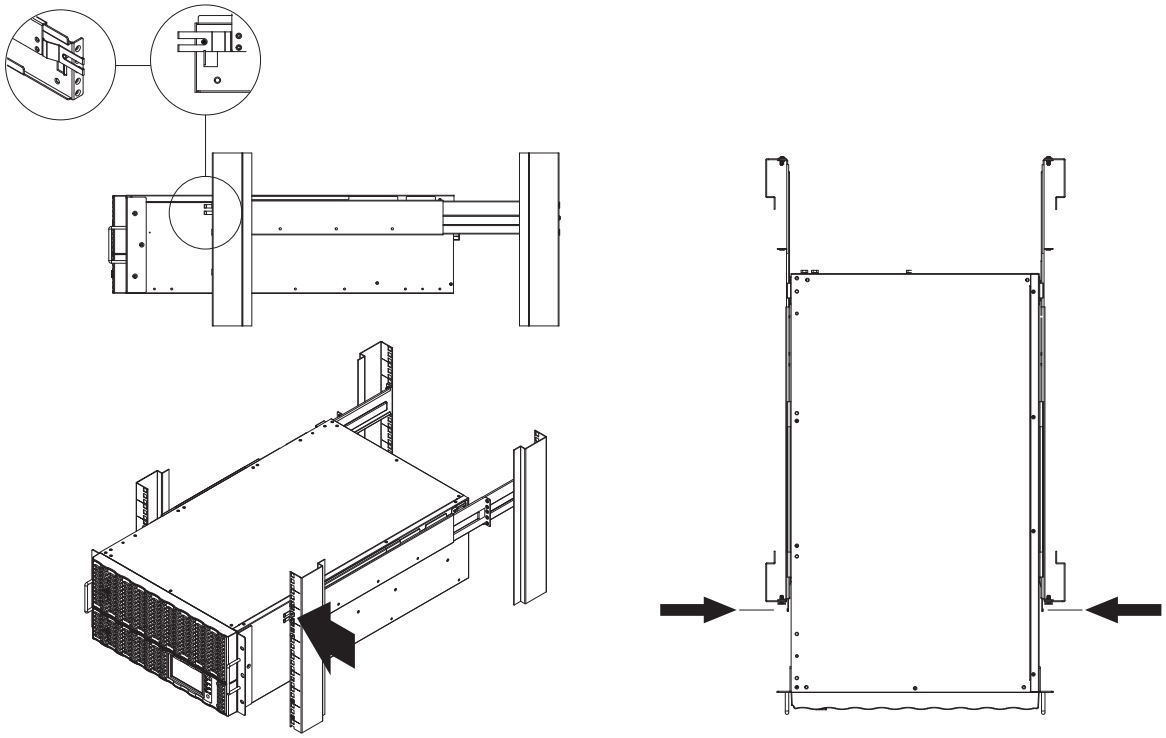


Fig.2-7 Rackmount rail Installation

STAND-ALONE TOWER UNIT INSTALLATION

Single Input type: (OL3T010KERTHDS / OL3T015KERTHDS / OL3T020KERTHDS / OL3T025KERTHDS / OL3T030KERTHDS / OL3T040KERTHDS)

Step 1 & 2: Fixed Wheels & Stands installation

Position the UPS in the desired location and fix the four wheels. Attach two Stands to the UPS using the provided M5X8L*4pcs screws.

Step 3: Fix the UPS Stands

It is recommended to use M10 or M8 expansion bolts to fix the UPS Stands.

Installation of expansion bolts: Drill holes on the floor. (The width is as the expansion bolts specification. The depth must exceed 50mm.) Fix the UPS to the floor with expansion bolts. Tighten the nuts of the expansion bolts on the floor holes.

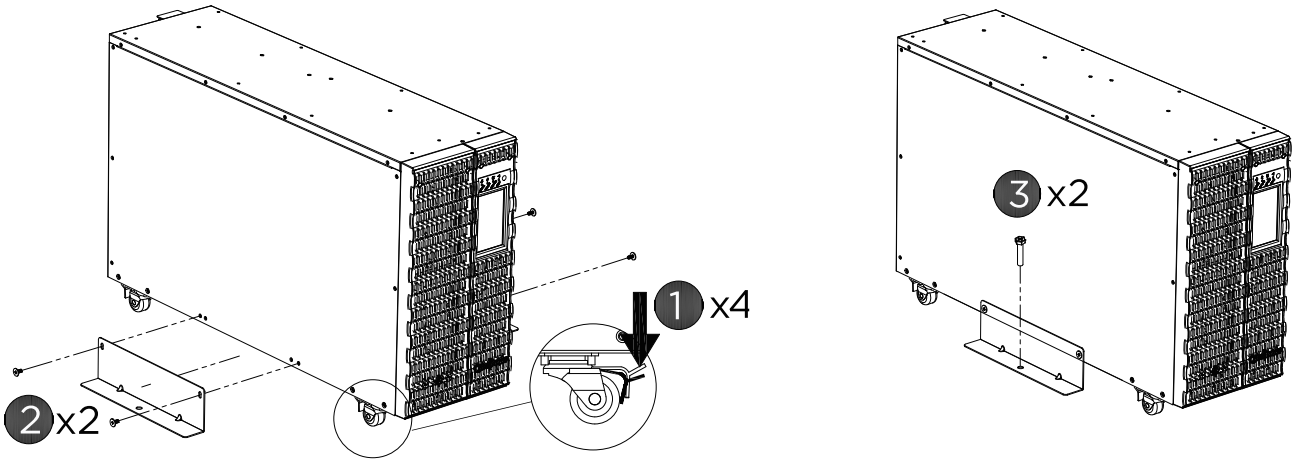


Fig.2-8 Tower (Single Input type) Installation

2.4 Wiring Cover installation

Step 1 & 2: Install the Two CABLE GLAND to TB main box.

Step 3: Power Cables goes through CABLE GLAND and assembles on UPS Rear panel's Terminal, then assembles TB main box on UPS Rear panel using the provided M5X8L*4pcs screws. (Install the power cables, more detail in section 2.5.4.)

Step 4: Attach TB Cover to the TB main box using the provided M5X8L*4pcs screws.

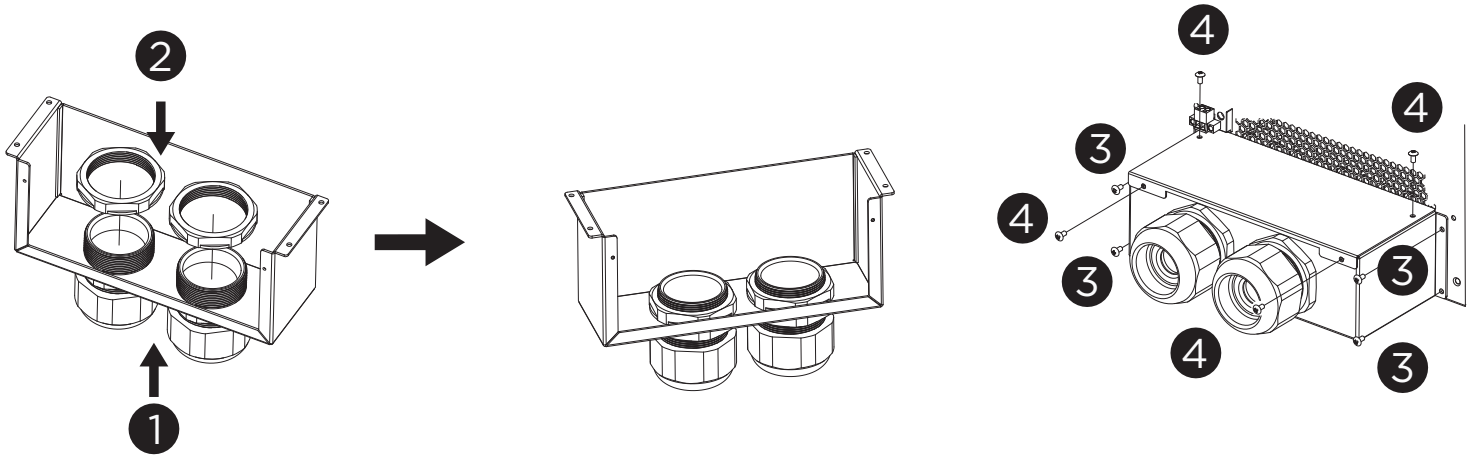


Fig.2-10a Wiring Cover installation (Two CABLE GLAND)

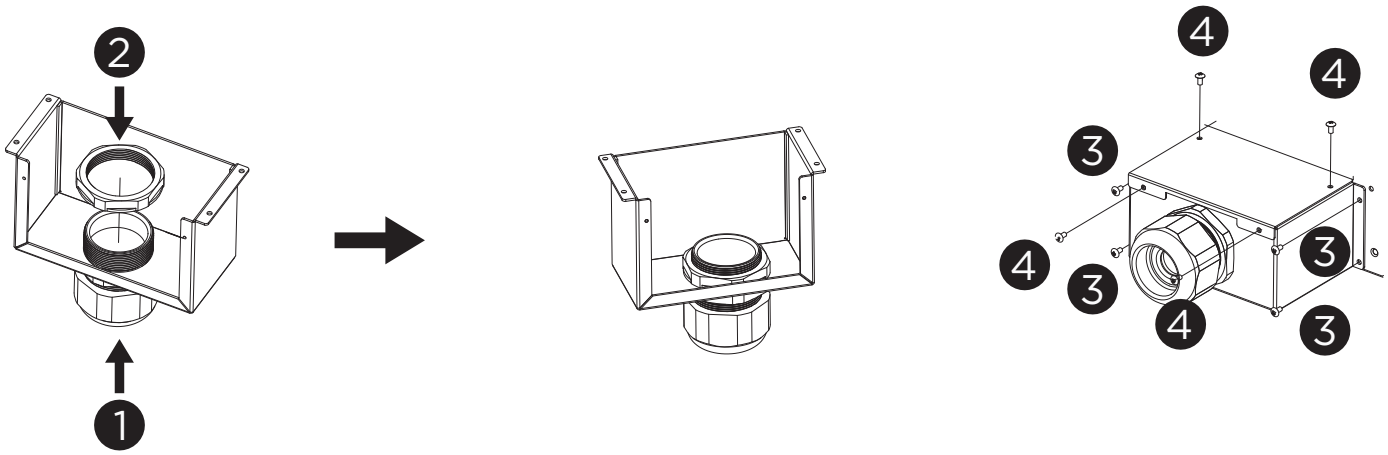


Fig.2-10b Wiring Cover installation (One CABLE GLAND)

2.5 Power Cables

2.5.1 Specifications

The UPS power cables are recommended in Table 2.1.
Table 2.1 Recommended cables for power cables

Cyberpower 10kVA: OL3T010KERTHDS / OL3T010KERTHD

10KVA / 10KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	27	27	27	27	16	16	16	16	16
Size (mm²)	10	10	10	16	10	10	10	16	16
Wire (AWG)	8	8	8	6	8	8	8	6	6

Cyberpower 15kVA: OL3T015KERTHDS / OL3T015KERTHD

15KVA / 15KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	35	35	35	35	23	23	23	23	23
Size (mm²)	10	10	10	16	10	10	10	16	16
Wire (AWG)	8	8	8	6	8	8	8	6	6

Cyberpower 20kVA: OL3T020KERTHDS / OL3T020KERTHD

20KVA / 20KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	43	43	43	43	31	31	31	31	31
Size (mm²)	10	10	10	16	10	10	10	16	16
Wire (AWG)	8	8	8	6	8	8	8	6	6

Cyberpower 25kVA: OL3T025KERTHDS / OL3T025KERTHD

25KVA / 25KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	51	51	51	51	38	38	38	38	38
Size (mm²)	10	10	10	16	10	10	10	16	16
Wire (AWG)	8	8	8	6	8	8	8	6	6

Cyberpower 30kVA: OL3T030KERTHDS / OL3T030KERTHD

30KVA / 30KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	59	59	59	59	46	46	46	46	46
Size (mm²)	16	16	16	25	16	16	16	25	16
Wire (AWG)	6	6	6	4	6	6	6	4	6

Cyberpower 40kVA: OL3T040KERTHDS / OL3T040KERTHD

40KVA / 40KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	75	75	75	75	61	61	61	61	61
Size (mm²)	16	16	16	25	16	16	16	25	16
Wire (AWG)	6	6	6	4	6	6	6	4	6

Cyberpower 45kVA: OL3T045KERTHD

45KVA / 40KW Power Cable									
Contents	**Input**				**Output**				**PE**
Phase	L1	L2	L3	N	L1	L2	L3	N	PE
Current(A)	75	75	75	75	69	69	69	69	69
Size (mm²)	16	16	16	25	16	16	16	25	16
Wire (AWG)	6	6	6	4	6	6	6	4	6

Battery Cable (40pcs Battery)									
KW	**10KW**			**15KW**			**20KW**		
Phase	BAT+	N	BAT-	BAT+	N	BAT-	BAT+	N	BAT-
Current(A)	27	27	27	41	41	41	54	54	54
Size (mm^2)	10	10	10	10	10	10	10	10	10
Wire (AWG)	8	8	8	8	8	8	8	8	8
KW	**25KW**			**30KW**			**40KW**		
Phase	BAT+	N	BAT-	BAT+	N	BAT-	BAT+	N	BAT-
Current(A)	67	67	67	80	80	80	106	106	106
Size (mm^2)	10	10	10	16	16	16	25	25	25
Wire (AWG)	8	8	8	6	6	6	4	4	4

Battery Cable (Less than 40pcs battery.)									
KW	**10KW**			**15KW**			**20KW**		
Phase	BAT+	N	BAT-	BAT+	N	BAT-	BAT+	N	BAT-
Current(A)	34	34	34	51	51	51	67	67	67
Size (mm^2)	10	10	10	10	10	10	10	10	10
Wire (AWG)	8	8	8	8	8	8	8	8	8
KW	**25KW**			**30KW**			**40KW**		
Phase	BAT+	N	BAT-	BAT+	N	BAT-	BAT+	N	BAT-
Current(A)	84	84	84	100	100	100	133	133	133
Size (mm^2)	16	16	16	25	25	25	35	35	35
Wire (AWG)	6	6	6	4	4	4	2	2	2

Note: The recommended cable section for power cables are only for situations described below:

- Ambient temperature: 30°C.
- AC loss less than 3%, DC loss less than 1%, The length of the AC power cables are no longer than 50 m and the length of the DC power cables are no longer than 30 m.
- Currents listed in the table are based on the 380V system (Line-to-line voltage).
- The size of neutral lines should be 1.5-1.7 times the value listed above when the predominant load is non-linear.
- A battery connector (Housings / Contacts) is provided, if the user needs to configure the battery cable by himself.

2.5.2 Specifications for Power Cables Terminal

Specifications for power cables connector are listed as Table 2.2.

Table 2.2 Requirements for UPS terminal

Port	Connection	Bolt	Bolt Aperture	Torque Moment
Mains input	Cables crimped OT terminal	M6	7mm	3.0Nm
Bypass Input	Cables crimped OT terminal	M6	7mm	3.0Nm
Battery Input	Cables crimped OT terminal	M6	7mm	3.0Nm
Output	Cables crimped OT terminal	M6	7mm	3.0Nm
PE	Cables crimped OT terminal	M6	7mm	3.0Nm

2.5.3 External breakers specifications

UPS external air breaker recommendations are shown in Table 2.3.

Table 2.3 UPS external breaker recommendation

Model Name	KW / KVA	Input	Bypass	Output	Battery	Model Name	KW / KVA	Input	Bypass	Output	Battery
OL3T010KERTHDS OL3T010KERTHD	10KW/10KVA	25A/4P	25A/3P	20A/3P	40A/3P	OL3T030KERTHDS OL3T030KERTHD	30KW/30KVA	80A/4P	80A/3P	50A/3P	100A/3P
OL3T015KERTHDS OL3T015KERTHD	15KW/15KVA	32A/4P	32A/3P	25A/3P	50A/3P	OL3T040KERTHDS OL3T040KERTHD	40KW/40KVA	100A/4P	100A/3P	63A/3P	150A/3P
OL3T020KERTHDS OL3T020KERTHD	20KW/20KVA	50A/4P	50A/3P	32A/3P	63A/3P	OL3T045KERTHD	40KW/45KVA	100A/4P	100A/3P	80A/3P	150A/3P
OL3T025KERTHDS OL3T025KERTHD	25KW/25KVA	63A/4P	63A/3P	40A/3P	80A/3P						

Attention:
The CB with RCD (Residual Current Device) is not suggested for the system.

2.5.4 Connecting Power Cables

The steps of connecting power cables are as follows:

1. Verify that all the switches of the UPS are completely open and the UPS internal maintenance bypass switch is open. Attach necessary warning signs to these switches to prevent unauthorized operation.
2. Open the Power wire Terminal Block Box. The input and output terminal, and protective earth terminal are shown in Fig.2-11

_ OL3T010KERTHDS / OL3T015KERTHDS / OL3T020KERTHDS / OL3T025KERTHDS / OL3T030KERTHDS / OL3T040KERTHDS

⏚	INPUT				OUTPUT				⏚
	L1	L2	L3	N	L1	L2	L3	N	

_ OL3T010KERTHD / OL3T015KERTHD / OL3T020KERTHD / OL3T025KERTHD / OL3T030KERTHD / OL3T040KERTHD / OL3T045KERTHD

⏚	INPUT								OUTPUT					⏚
	mL1	bL1	mL2	bL2	mL3	bL3	mN	bN	L1	L2	L3	N	N	

Fig.2-11 connections terminals

3. Open the Battery wire Terminal Block Box. The battery terminal is shown in Fig.2-12

BAT +	BAT N	BAT -
BATTERY INPUT		

Fig.2-12 connections terminals

4. Connect the protective earth wire to protective earth terminal (PE).
5. Connect the AC input supply cables to the Input terminal and AC output supply cables to the Output terminal.
6. Connect the Battery cables to the Battery terminal.
7. Check to make sure there is no mistake and re-install all the protective covers.

⚠	**Attention:** The operations described in this section must be performed by authorized electricians or qualified technical personnel. If you have any difficulties, contact the manufacturer or agency.
⚠	**Warning:** • Tighten the connections terminals to enough torque moment, refer to Table 2.2, and please ensure correct phase rotation. • The grounding cable and neutral cable must be connected in accordance with local and national codes. • When the cable holes does not goes through by cables, it should be filled by the hole stopper

Notice:
It is required to install an external isolating device against current back-feed between Mains input / Bypass and UPS. The current rating should be more than 1.3 times of UPS capacity.

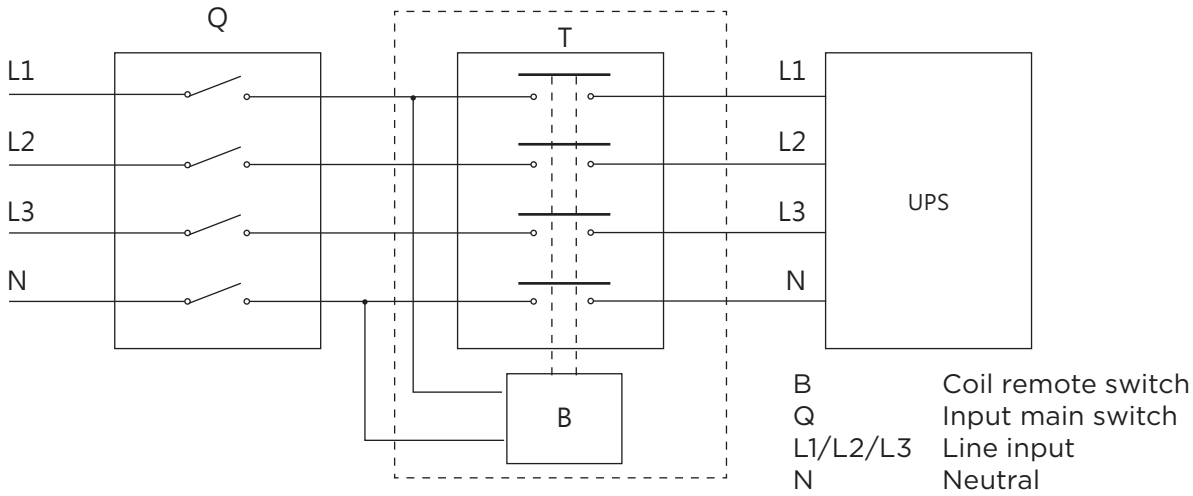


Fig.2-13 External isolating device installation

2.5.5 Connecting for Dual Input (OL3T010KERTHD / OL3T015KERTHD / OL3T020KERTHD / OL3T025KERTHD / OL3T030KERTHD/OL3T040KERTHD/OL3T045KERTHD)

Dual Input Unit has two wiring methods for users to use.

1. Single Input wiring method.
   The Main Input(mL1/mL2/mL3/mN) is transmitted to the Bypass Input(bL1/bL2/bL3/bN) using provided copper sheet. The user only needs to configure the Main Source Cable(L1/L2/L3/N) to the Main Input and N.

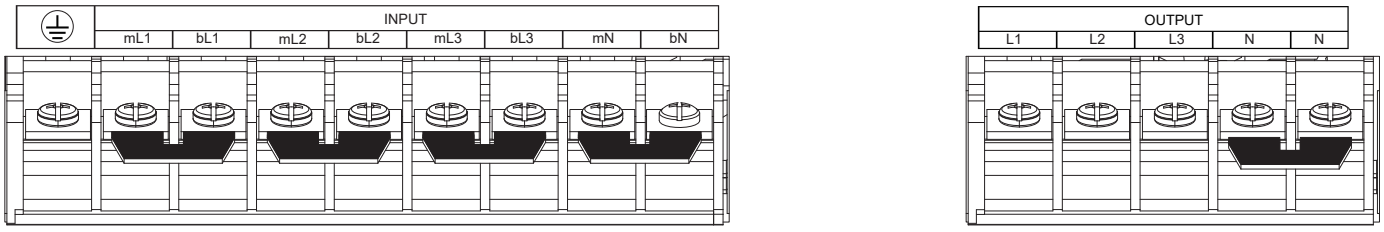


Fig.2-14a Wiring method of Single Input

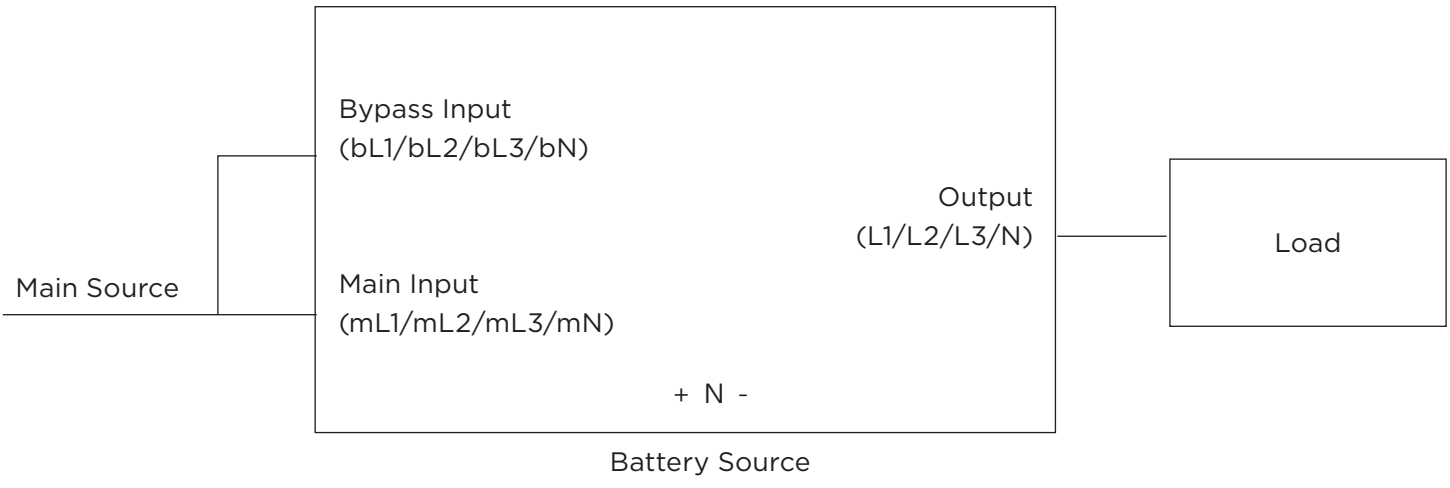


Fig.2-14b Wiring diagram of Single Input

2. Dual Input wiring method.
   The Main Source Cable(L1/L2/L3/N) Connecting Main Input(mL1/mL2/mL3/mN). The Bypass Source Cable(L1/L2/L3/N) Connecting Bypass Input(bL1/bL2/bL3/bN). No Using Copper sheet.

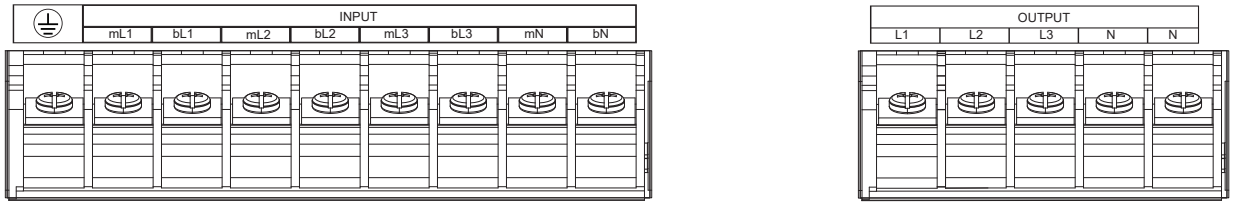


Fig.2-15a Wiring method of Dual Input

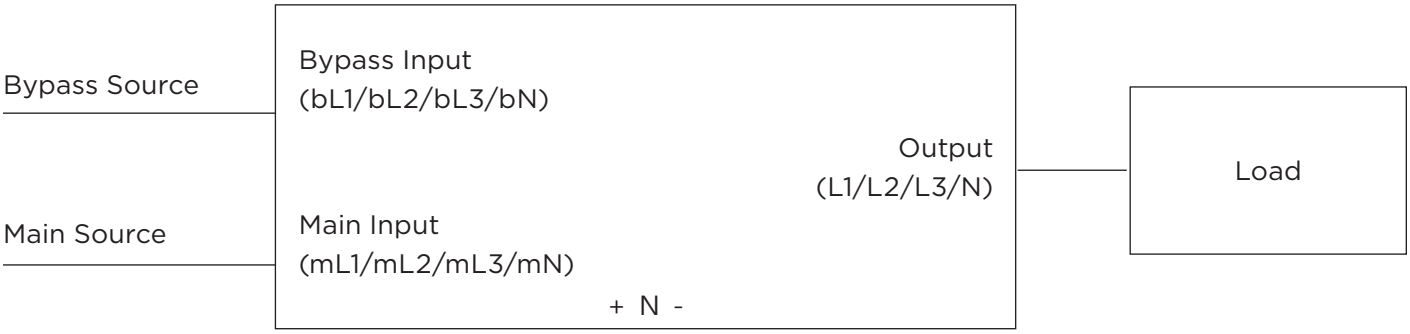


Fig.2-15b Wiring diagram of Dual Input

⚠	**Attention:** The N of Bypass Source needs to be connected to the N of Main Source.

2.5.6 Connecting for Battery Cable

1. Installation of Battery Cable
   Users use Standard Extended Battery Module (BME480V55ART5U). Battery Module have Standard Battery cable. User use Non-Standard Battery. The following describes how to install the Battery cable.

   Prepare the wires that the user needs to crimp. The wire diameter should not exceed 35mm/2AWG. Use crimping pliers to assemble the Contacts of the accessories. Assemble the Contacts into Housings and pay attention to the polarity and color of the wiring.

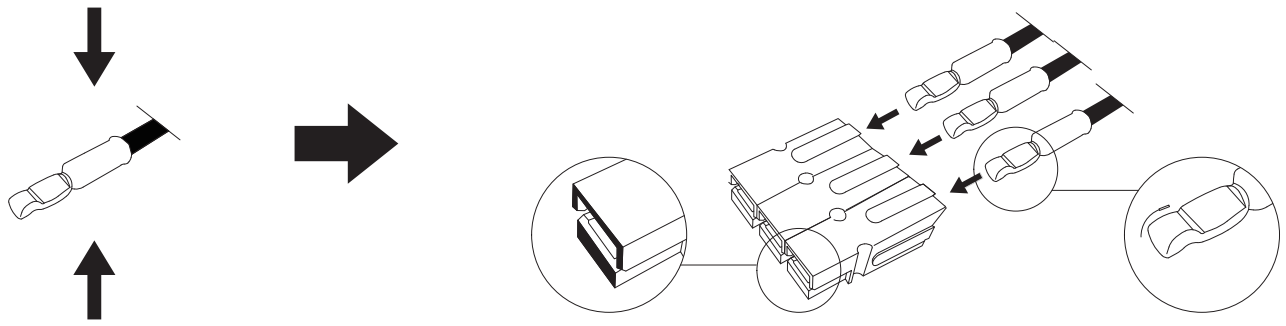


Fig.2-16 Battery cable combination

⚠	**Attention:** User assembles the battery by self. Note that the battery needs to be equipped with a protection device (Circuit breaker or Fuse).

2. Standard Battery/GND Cable assembly

Step 1: Use the Battery Cable & GND Cable connecting the 1st EBM to the Power module according to the figure as below.

Step 2: Use the Battery Cable & GND Cable connecting the 2nd EBM to the 1st EBM.

Step 3: Attach Ground wire fixed plate to UPS/EBM using the provided M3X6L screws and fix GND Cable that using Cable tie as below fig.

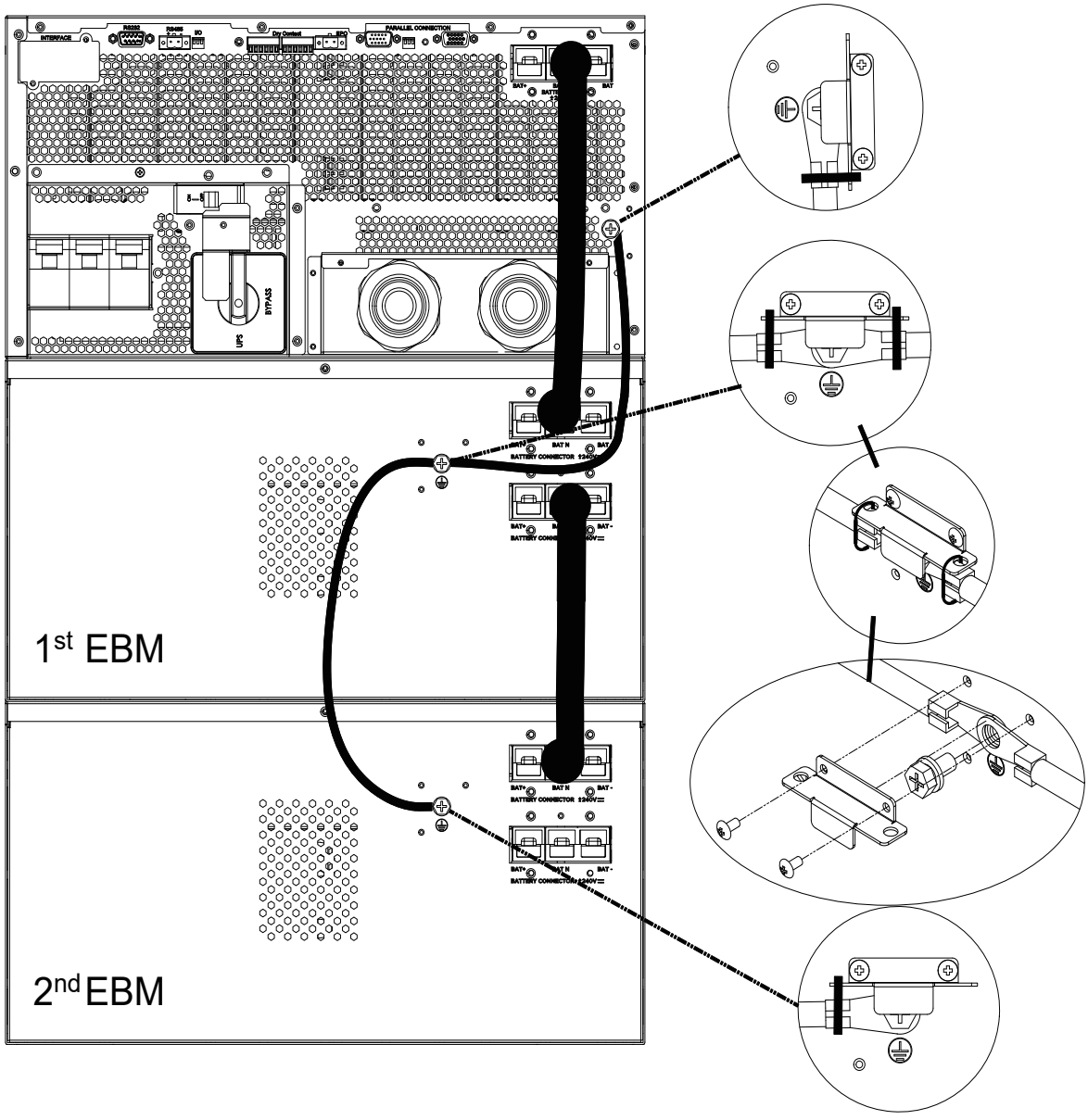


Fig.2-17 Battery/GND Cable assembly

Attention:
When using Standard Extended Battery Module. The number of modules can be used from 2 to 10 packs. Note that at least 2 modules should be used.

Chapter 2 Installation Instruction

2.6 Control and Communication Cables

The rear panel of the cabinet provides dry contact interface(J1-J4), communication interface (RS485, SNMP and Parallel interface) and maintenance service port (RS232), as it is shown in Fig.2-18a & Fig.2-18b.

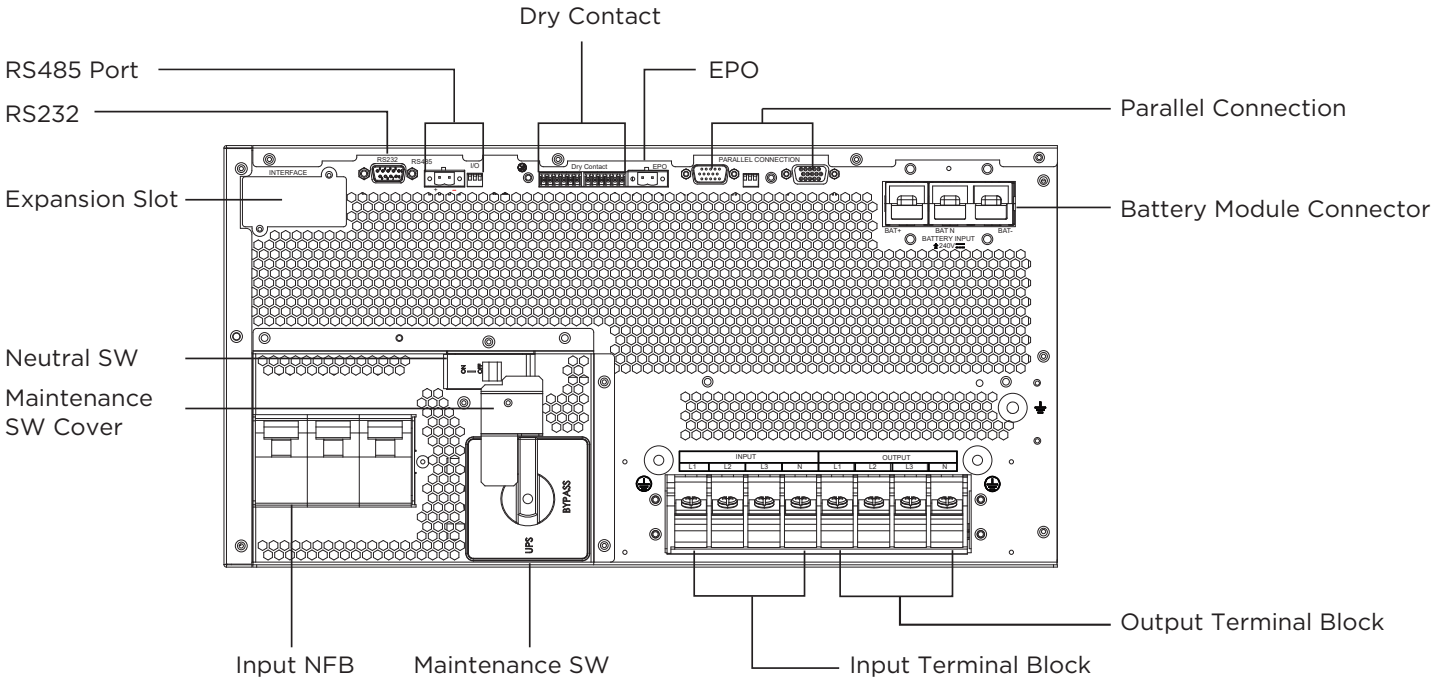


Fig.2-18a Control & communication interface (Stand-alone Tower _ Single input)

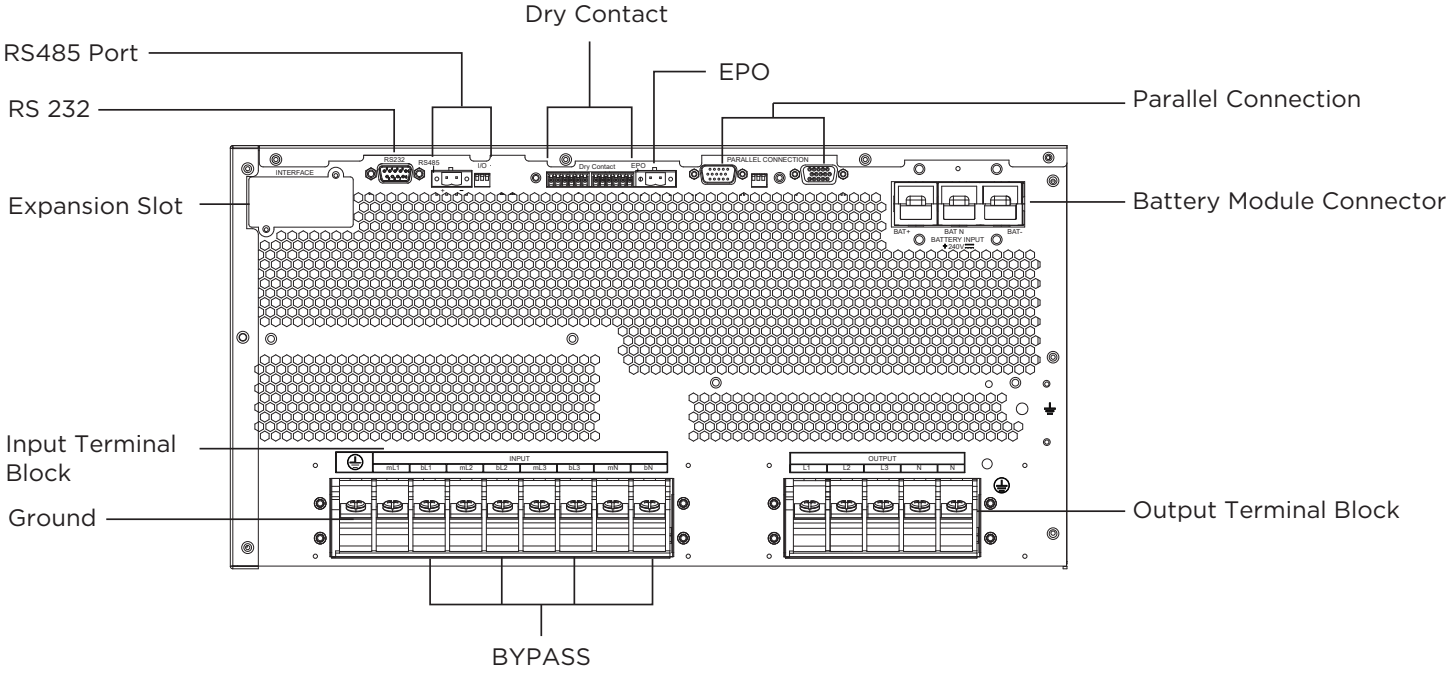


Fig.2-18b Control & communication interface (Rack-mountable _ Dual input)

2.6.1 Dry Contact Interface

Dry contact interface includes port J1-J4 and the functions of the dry contact are shown in Table 2-4

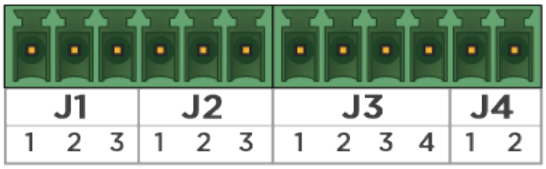


Fig.2-19 Dry contact interface

Table 2-4. Functions of the port

No.	Function	Detail	Default Setting
J1-1	Battery Low Alarm (COM)	Common terminal for J1-2 and J1-3	Disable
J1-2	Battery Low Alarm (NC)	Output dry contact (Normally closed) trigger relay with low battery alarming	
J1-3	Battery Low Alarm (NO)	Output dry contact (Normally open), trigger relay with low battery alarming	
J2-1	Fault Alarm (COM)	Common terminal for J2-2 and J2-3	
J2-2	Fault Alarm (NC)	Output dry contact, (Normally closed) trigger relay with UPS fault alarming	
J2-3	Fault Alarm (NO)	Output dry contact, (Normally open) trigger relay with UPS fault alarming	
J3-1	Dry Relay Output (COM)	Common terminal for J3-2 and J3-4	
J3-3			
J3-2	Dry Relay Output (NC)	Output dry contact (Normally closed), function is settable. Default: Trigger relay when disconnect with EPO connector	
J3-4	Dry Relay Output (NO)	Output dry contact (Normally open), function is settable. Default: Trigger relay when disconnect with EPO connector	
J4-1	Dry Input	[ROO] (Remote On/Off) to turn the UPS on remotely when the contact is closed and turn the UPS off remotely when the contact is open [MBS] (Maintenance Bypass Switch) to do nothing when the contact is open and turn the UPS to bypass when the contact is closed	
J4-2	Dry Input (GND)	Ground terminal for for J4-1	

Output Dry Contact Port (J1, J2 and J3)

The output dry contact port diagram is as blew.

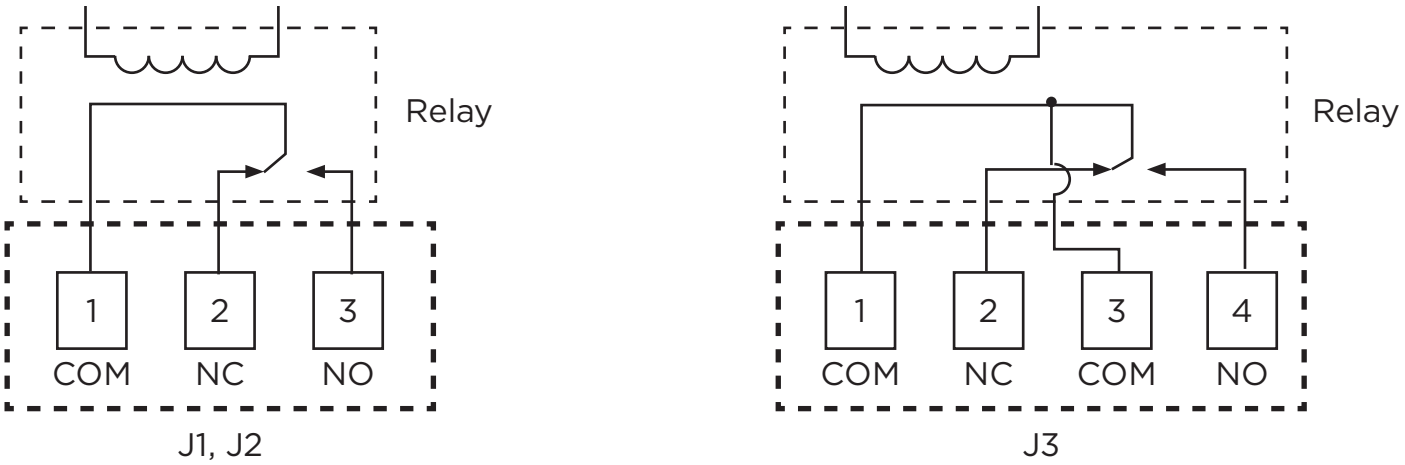


Fig.2-20 Diagram of output dry connecto

Output Dry contact	
Connector	24Vdc, 1A, 16AWG Maximum wires

Input Dry Contact Port (J4)

The input dry contact port able to receive the ROO or MBS remote signal with outside connector.

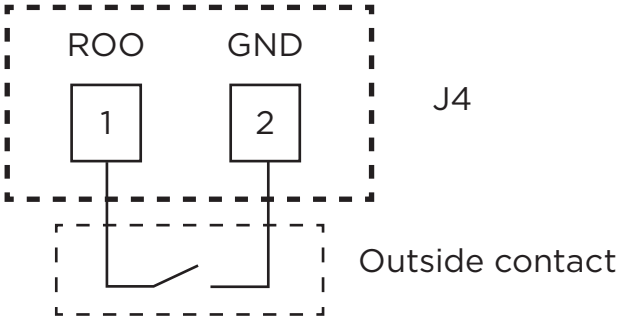


Fig.2-21 Diagram of input dry connector

EPO (Emergency Power Off) Connector Port

To shutdown the UPS remotely when the contact is open(default) or close.

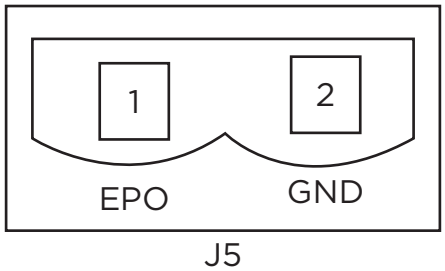


Fig.2-22 Diagram of EPO connector

Table.2-5 Description of EPO connector

No.	Function	Detail	Default Setting
J5-1	EPO	EPO function is settable. Default: Trigger EPO function when disconnect with J5-2.	Enable
J5-2	EPO (GND)	Ground terminal for EPO	

2.6.2 Communication Interface

RS485 port: Provide serial data with MODBUS protocol which can be used for local network or integrated monitoring system in the service room.

SNMP: Used on site installation for communication (Optional).

2.6.3 Maintenance service port

RS232 port: Reserved for commissioning and maintenance by authorized engineers.

Chapter 3 LCD Panel

This chapter introduces the functions and operator instructions of the operator control and display panel in detail, and provides LCD display information, including LCD display types, detailed menu information, prompt window information and UPS alarm information.

3.1 Control and Operation Panel

The operation control panel of UPS is located on the front panel of the case. By operating the LCD, the UPS can be operated, controlled, and checked for all its parameters, operating status, and alarm information. As shown in Fig.3-1

The front panel of the UPS can be divided into three parts: LED indicator, touch panel, power on/off operation key. The front panel components of the UPS are described in Table 3-1.

Fig.3-1 Front panel of UPS

Table 3.1 Description of front panel components

Number	Name	Function
1	Touch Panel	Can operate, control, and query all its parameters, running status, and alert information to the UPS.
2	Cold Start	UPS cold start button
3	LED	Status indicator light
4	Logo	Trademark

Chapter 3 LCD Panel

3.2 LCD Screen

After the monitoring system starts self-test, the system enters the home page, following the welcome window. The home page is shown in Fig.3-2. The system home page description is shown in Table 3.2:

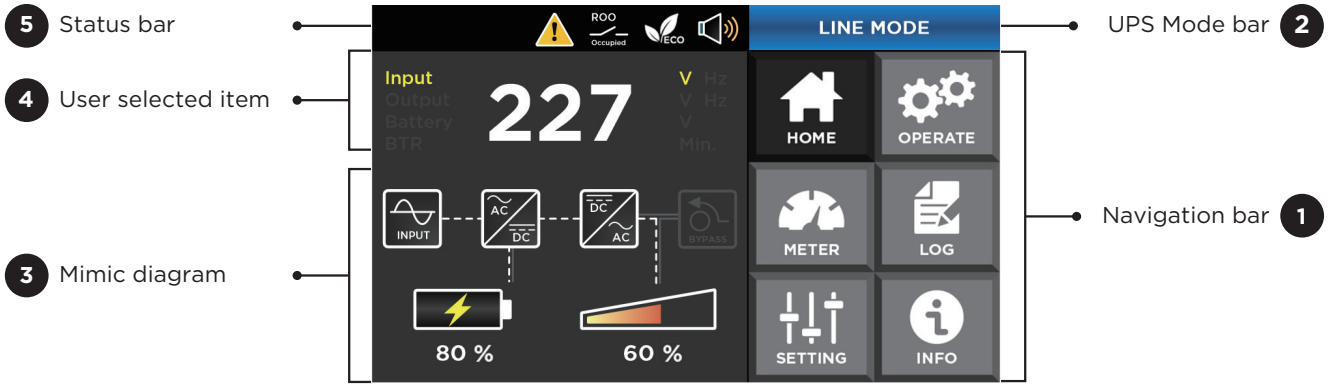


Fig.3-2 Home page

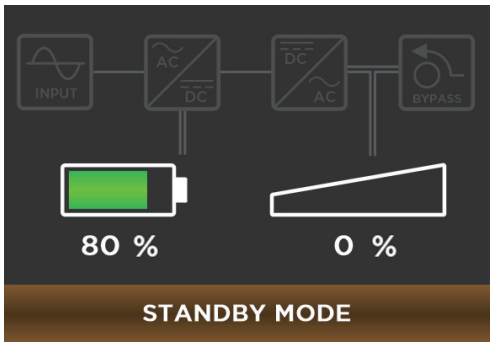
Table 3.2 Description of system home page component

Number	Name	Function
1	Navigation bar	The six buttons of the primary function.
2	Mode bar	The UPS operation mode will always show on screen to indicate the present status of UPS.
3	Mimic diagram	Indicates the current running state and power flow of the UPS.
4	User select item	Highlight the most important value by user selection.
5	Status bar	Shows the status of alarm, ECO, buzzer etc.

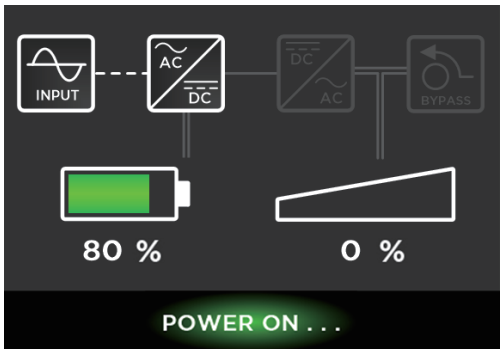
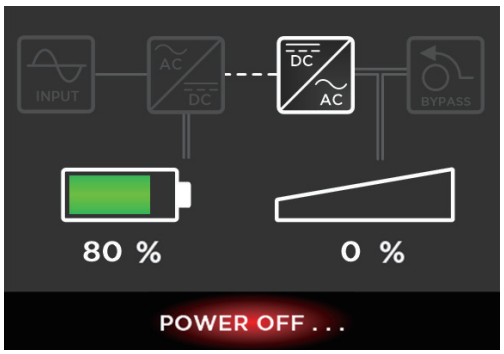
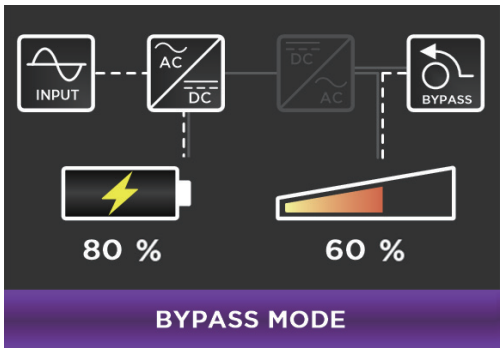
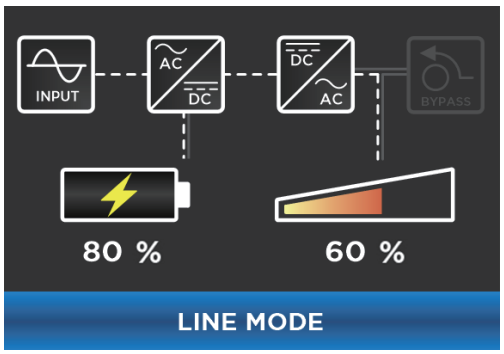
3.2.1 UPS Operation Mode

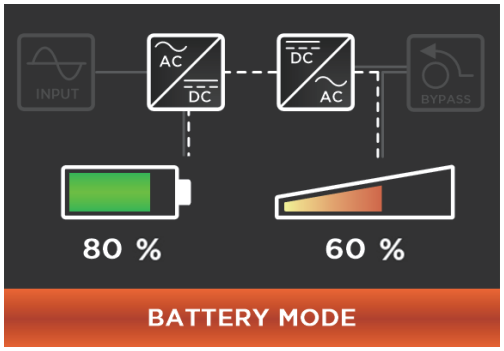
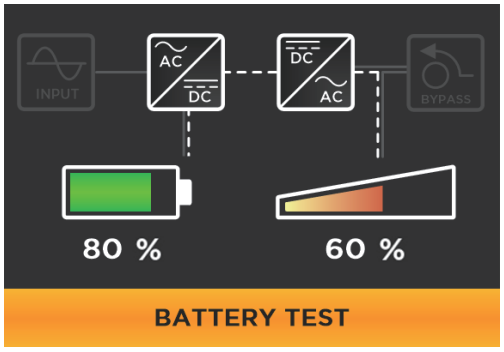
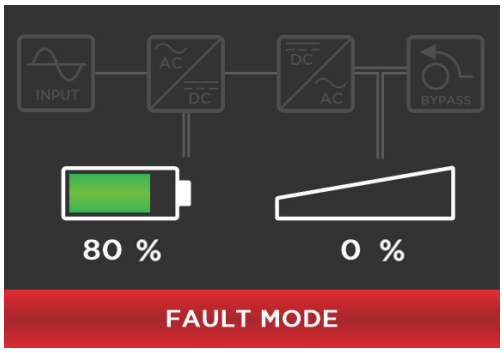
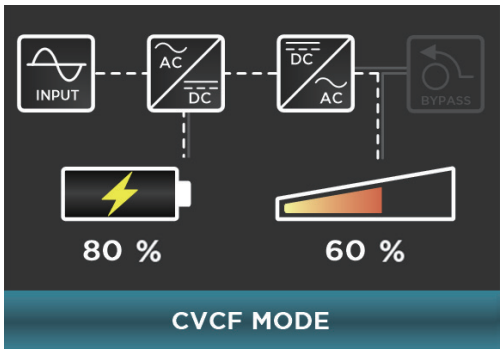
There are several operation modes in UPS. From the “HOME” page, the UPS mode bar & mimic diagram presents the current operation mode clearly.

Table 3.3 UPS Operation Mode

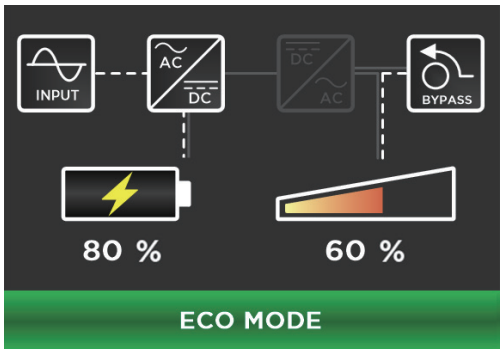
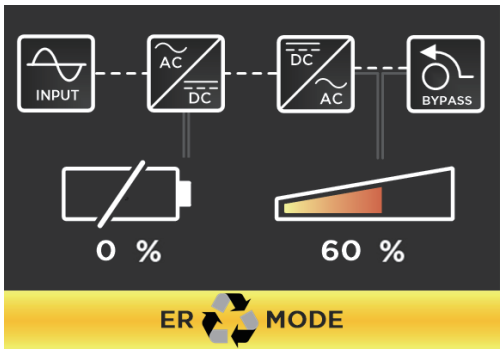
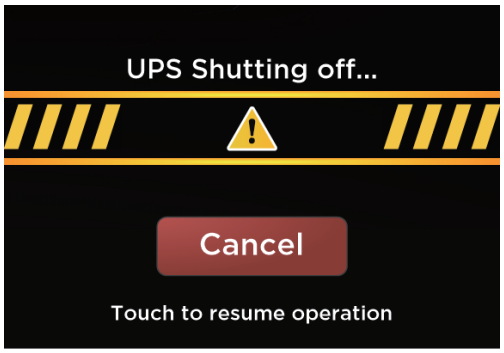
Operation Mode	Description	Load Powered	Load Protected
	The UPS has not been started. Logic is powered by AC input or DC battery. All user settings can be adjusted in this mode.	×	×

Chapter 3 LCD Panel

Operation Mode	Description	Load Powered	Load Protected
	The UPS is starting... At this stage, DC bus is charging from AC input or DC battery, then turn on inverter to go to next stage.	✕	✕
	The UPS is powering off... At this stage, DC bus is releasing by internal consuming. After that, UPS will back to standby mode.	✕	✕
	The UPS feeds power to the load. Load energy is taken from the bypass route. Battery will be charged if AC input exists. However, the load is not protected at this mode.	✔	✕
	The UPS feeds power to the load through the inverter. Load energy is taken from the utility. Battery will be charged.	✔	✔

Operation Mode	Description	Load Powered	Load Protected
	The UPS feeds power to the load through the inverter. Load energy is taken from the battery.	✔	✔
	The UPS feeds power to the load through the inverter. Load energy is taken from the battery. Battery test or battery maintenance will trip this mode	✔	✔
	The UPS is stopped due to emergency or fault event.	✕	✕
	The UPS feeds power to the load through the inverter. Load energy is taken from the utility. Battery will be charged. Bypass transfer is forbidden @ CVCF mode CVCF (Constant Voltage & Constant Frequency) mode will provide the fixed output V & F without AC input synchronizing.	✔	✔

Chapter 3 LCD Panel

Operation Mode	Description	Load Powered	Load Protected
	The UPS feeds power to the load. Load energy is taken from the bypass route. Battery will be charged if AC input exists. It is similar to Bypass mode but the load is protected.	✔	✔
	The UPS is not providing power to the load. This mode is used to functional check by the installer.	✕	✕
	The UPS is shutting down... If the AC input is not existed at standby mode, the UPS will totally shut down to prevent battery consuming.	✕	✕

3.2.2 UPS Status Bar

At the top of “HOME” page, a mode bar is present to indicate the current UPS status. There are several types of status icons during UPS operation, as shown in Table 3.4.

Table 3.4 Description of UPS Status Icon

UPS Status Icon	Description
	**Auto On: Activate** The UPS will be start-up automatically soon without remote or local operation. This might be triggered by “Auto Start”, “Auto Restart” or “Start on bypass” condition.
	**Warning alarm: Activate** The system detects the abnormal status and send the warning alarm.
	**Fault alarm: Activate** The system detects the critical status and send the fault alarm.
	**Remote On/Off: Enable** The ROO function has been selected, the power on/off command & button on front panel will be disabled.
	**Maintenance bypass switch cover: Remove** The maintenance switch cover has been removed. The system will transfer to bypass (if possible) automatically.
	**Emergency Power Off: Activate** The EPO signal has been tripped. The system will power off and transfer to fault mode immediately.
	**ECO mode: Enable** The power strategy is ECO, the system will turn into ECO mode when the power quality is good.
	**ECO mode: Running** The system is working as ECO mode currently.
	**CVCF mode: Enable** The power strategy is CVCF, the system will turn into CVCF mode when the system is powering on.
	**CVCF mode: Running** The system is working as CVCF mode currently.
	**Buzzer alarm: Enable** UPS will send audible alarm when system is in the status of power on/off, warning or fault.
	**Buzzer alarm: Disable** UPS is silent even if warning or fault occurs.

3.3 Main menu

The main menu includes Home, Operate, Meter, Log, Setting and Info and it is described in details below.

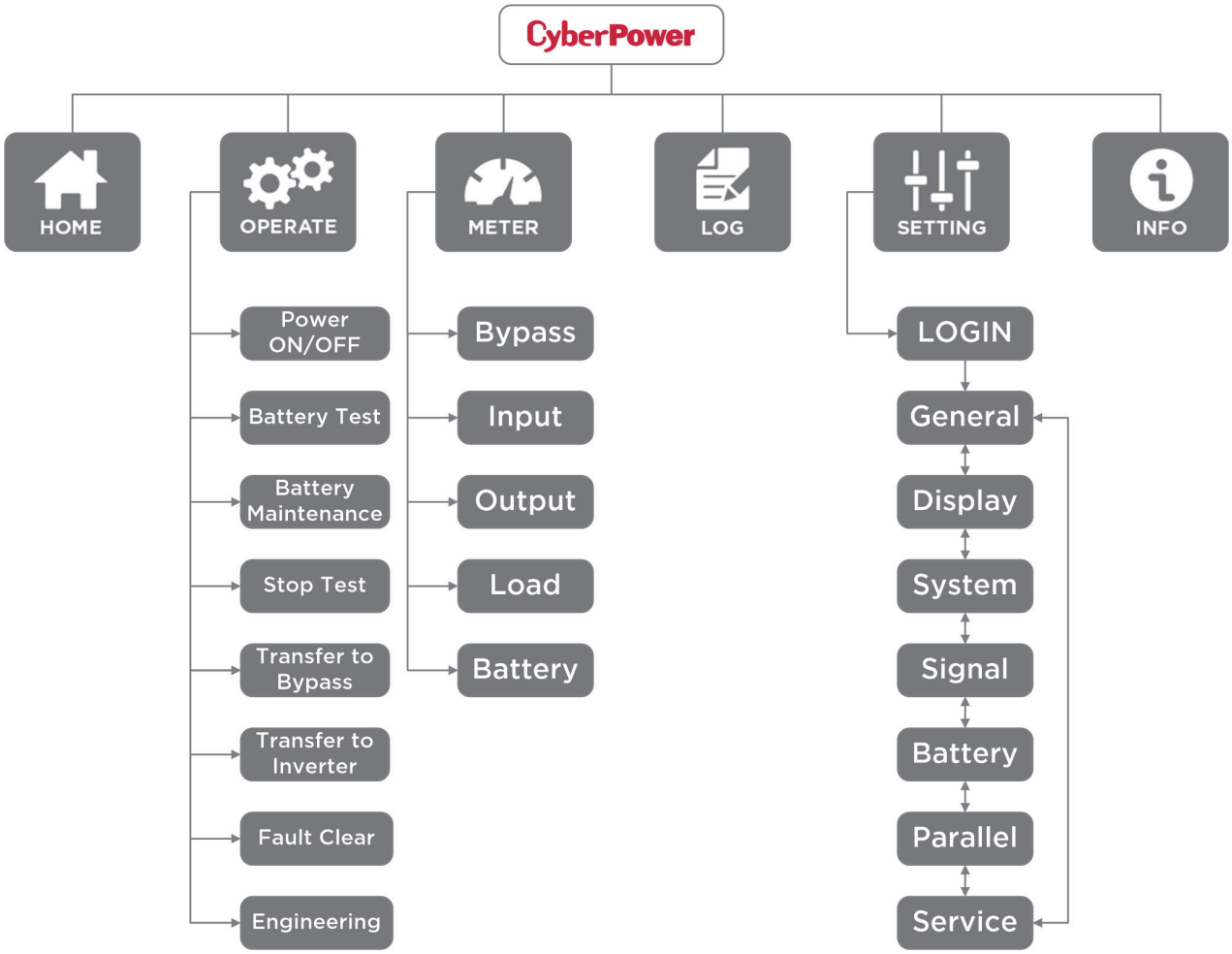


Fig.3-3 LCD Menu Structure

3.3.1 Home

Touch “HOME” button and the screen enter the page of the Home, as it is shown in Fig.3-2.

3.3.2 Meter

Touch the “METER” button, and the screen enters the meter page. The meter page includes Bypass, Input, Output, Load and Battery sub-page, as is shown in Fig.3-4.

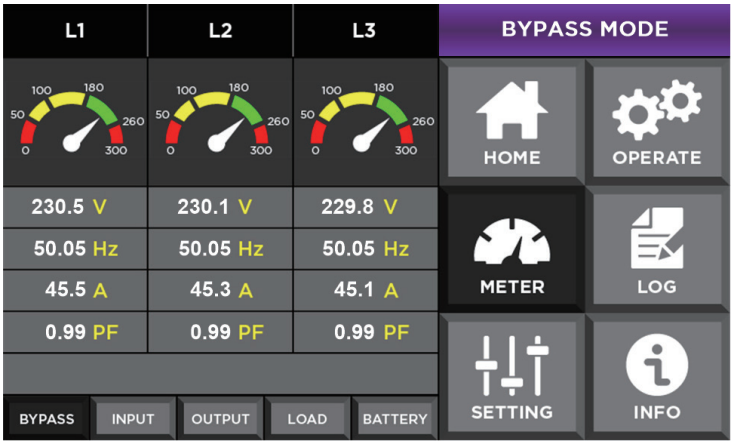


Fig.3-4 Data display page (BYPASS)

The bypass data page displays bypass voltage, frequency, current, power factor.

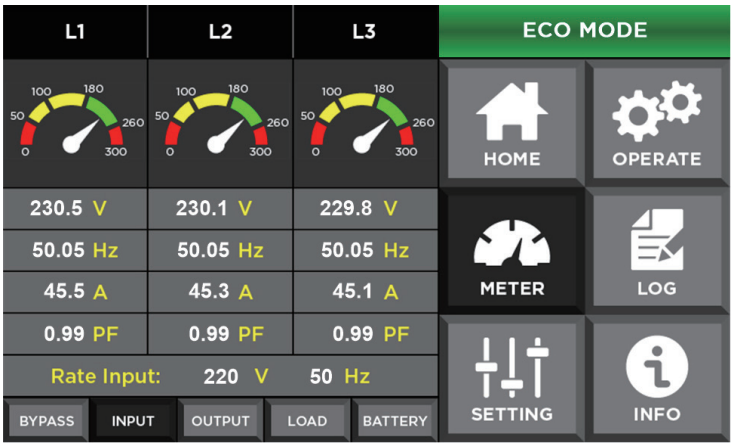


Fig.3-5 Data display page (INPUT)

The main input data page displays voltage, frequency, current, power factor, rated input voltage and frequency.

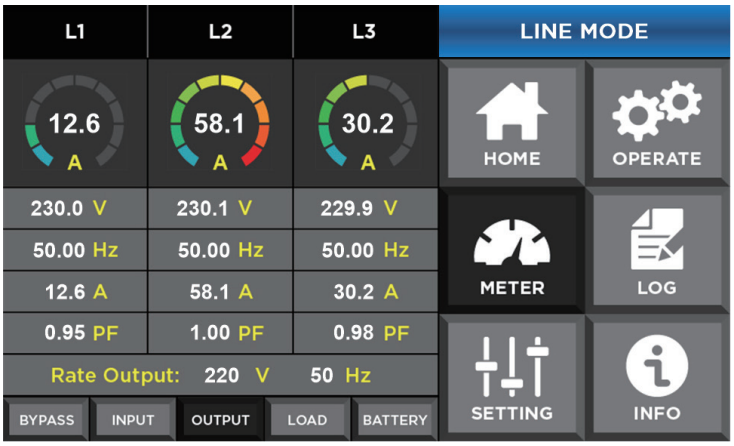


Fig.3-6 Data display page (OUTPUT)

The output data page displays the output voltage of each phase, the output frequency, the output current, the output power factor, the rated output voltage and the frequency.

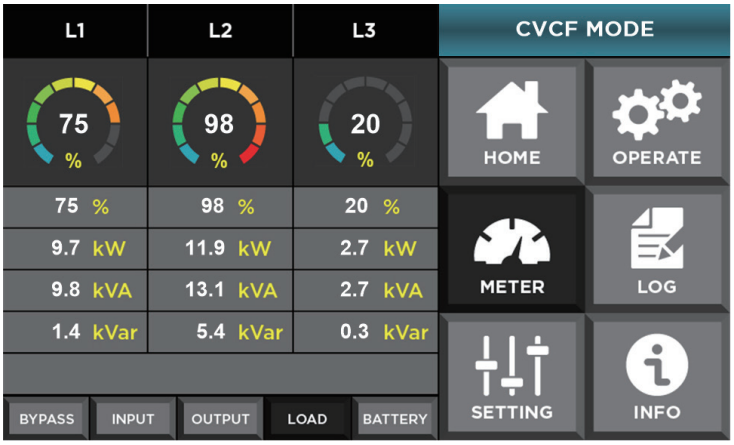


Fig.3-7 Data display page (LOAD)

The load data page displays each phase output load percentage, the load power, the load active power, and the load reactive power.

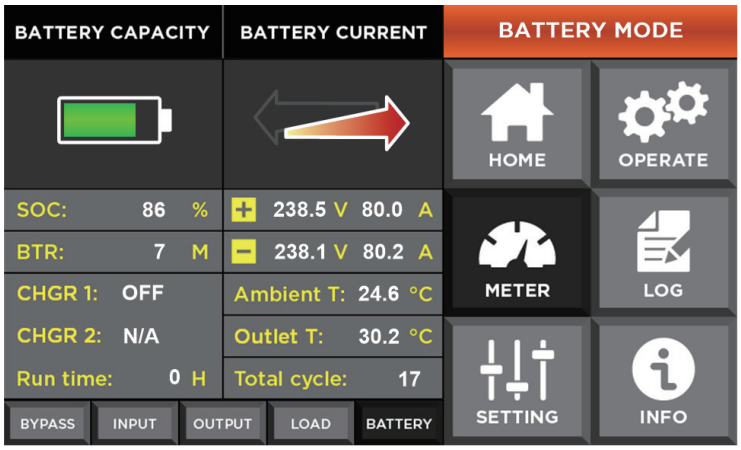


Fig.3-8 Data display page (BATTERY)

The battery data display page displays key parameters of battery, such as battery voltage, battery current, battery capacity, etc.

3.3.3 Log

Touch the “LOG” icon, and the screen enters the interface of the Log, as it is shown in Fig.3-9. The log is listed in reverse chronological order (i.e. the first on the screen with #1 is the most new), which displays the events, warnings and faults information and the data and time they occur and disappear.

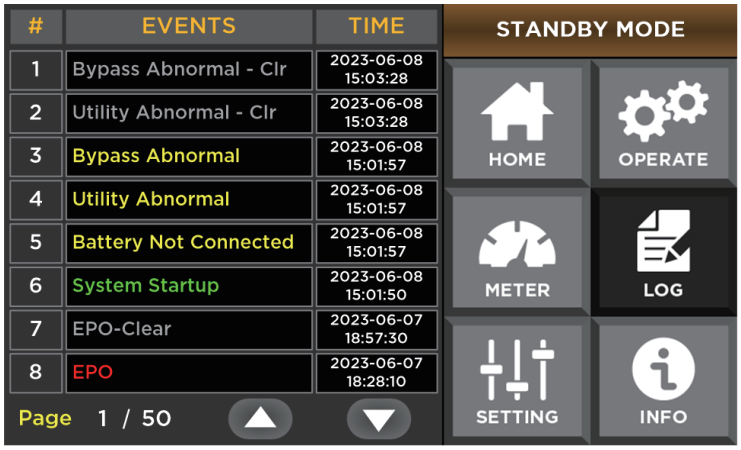


Fig.3-9 Log page

The following Table3.5 gives events of UPS History Log.

Table 3.5 List of History Log

Index	LCD Display	Explanation
1	System Startup	UPS startup from AC or DC
2	Bypass Abnormal	Bypass is abnormal
3	Bypass Abnormal-Clr	Incident above disappears
4	Load On UPS	Output power from UPS inverter
5	Load On Bypass	Output power from bypass route
6	No Load	Output power is lost

Index	LCD Display	Explanation
7	Battery Charge - Boost	Charger is boosting battery voltage
8	Battery Charge - Float	Charger is floating battery voltage
9	Battery Discharge	Battery is discharging
10	Battery Connected	Battery cables are connected
11	Battery Not Connected	Battery cables are disconnected
12	Maintenance CB Closed	Maintenance circuit breaker is closed
13	Maintenance CB Open	Maintenance circuit breaker is opened
14	EPO	Emergency Power Off
15	EPO-Clear	Incident above disappears
16	Utility Abnormal	Utility (Grid) is abnormal
17	Utility Abnormal-Clr	Incident above disappears
18	Bypass Sequence Error	Bypass voltage sequence is reversed
19	Bypass Sequence-Clr	Incident above disappears
20	Bypass Volt Abnormal	Bypass voltage is abnormal
21	Byp Volt Abnormal-Clr	Incident above disappears
22	Bypass Module Fail	Bypass module FAIL
23	Bypass Module Fail-Clr	Incident above disappears
24	Bypass Overload	Bypass is overload
25	Bypass Overload-Clr	Incident above disappears
26	Bypass Ovload Tout	Bypass overload timeout
27	Bypass Ovload Tout-Clr	Incident above disappears
28	Byp Freq Over Track	Bypass frequency is over the tracking range
29	Byp Freq Over Track-Clr	Incident above disappears
30	Exceed Tx Times	Transfer time (from inverter to bypass) in 10 minutes exceed the limit.
31	Exceed Tx Times-Clr	Incident above disappears automatically after 20 minutes.
32	O/P Short Circuit	Output shorted circuit
33	O/P Short Circuit-Clr	Incident above disappears
34	Battery EOD	Battery end of discharge
35	Battery EOD-Clear	Incident above disappears
36	Battery Test	Battery test starts
37	Battery Test OK	Battery test PASS
38	Battery Test Fail	Battery test FAIL

Index	LCD Display	Explanation
39	Batt. Maintenance	Battery maintenance starts
40	Batt. Maintenance OK	Battery maintenance PASS
41	Batt. Maintenance Fail	Battery maintenance FAIL
42	Stop Test	Battery test or maintenance stop
43	Fault Clear	Clear the fault lock status
44	Log Clear	Clear the event logs
45	Rectifier Fail	Rectifier FAIL
46	Rectifier Fail-Clr	Incident above disappears
47	Inverter Fail	Inverter FAIL
48	Inverter Fail-Clr	Incident above disappears
49	Rectifier OvTemp.	Rectifier temperature is too high
50	Rectifier OvTemp.-Clr	Incident above disappears
51	Fan Fail	Main fan FAIL
52	Fan Fail-Clr	Incident above disappears
53	Output Overload	Output is overload
54	Output Overload-Clr	Incident above disappears
55	Output Ovload Tout	Output overload timeout
56	Output Ovload Tout-Clr	Incident above disappears
57	Inverter OvTemp.	Inverter temperature is too high
58	Inverter OvTemp.-Clr	Incident above disappears
59	On UPS Inhibited	Inhibit system transfer from bypass to inverter
60	On UPS Inhibited-Clr	Incident above disappears
61	Manual Transfer to Byp	Transfer to bypass manually
62	Esc Manual Transfer Byp	Cancel to bypass manually
63	Battery Volt Low	Battery voltage is low
64	Battery Volt Low-Clr	Incident above disappears
65	Batt. Wiring Error	Battery pole (positive and negative are reversed)
66	Batt. Wiring Error-Clr	Incident above disappears
67	Inverter Protect	Inverter protect (Inverter voltage abnormal or power back feed to DC Bus)
68	Inverter Protect-Clr	Incident above disappears
69	Input Neutral Lost	Input grid neutral lost

Index	LCD Display	Explanation
70	Charger Fan Fail	Charger fan FAIL
71	Charger Fan Fail-Clr	Incident above disappears
72	Manual Shutdown	Shutdown UPS output power manually
73	Parallel Cable Err	Parallel cable in error
74	Parallel Cable Err-Clr	Incident above disappears
75	Charger Fail	Charger test FAIL
76	Charger Fail-Clr	Incident above disappears
77	Ambient Over Temp.	Ambient temperature is too high
78	Ambient Over Temp.-Clr	Incident above disappears
79	Sync Pulse Fail	Line sync pulse is abnormal
80	Sync Pulse Fail-Clr	Incident above disappears
81	Battery Volt Over	Battery voltage is over-charged
82	Battery Volt Over-Clr	Incident above disappears
83	Output Sequence Err	Output voltage sequence is reversed
84	Output Sequence-Clr	Incident above disappears
85	PFC Over Temp.	PFC temperature is too high
86	PFC Over Temp.-Clr	Incident above disappears
87	Outlet Over Temp.	Outlet temperature is too high
88	Outlet Over Temp.-Clr	Incident above disappears
89	Input Curr Unbalance	Input current is not balance
90	Input Curr Unbalance-Clr	Incident above disappears
91	DC Bus Over Volt	DC bus voltage is too high
92	DC Bus Over Volt-Clr	Incident above disappears
93	REC Soft Start Fail	Rectifier soft start fails
94	REC Soft Start Fail-Clr	Incident above disappears
95	Relay Connect Fail	Inverter relay in open circuit
96	Relay Connect Fail-Clr	Incident above disappears
97	Relay Short Circuit	Inverter relay in short circuit
98	Relay Short Circuit-Clr	Incident above disappears
99	PWM Sync Fail	PWM sync signal is abnormal
100	PWM Sync Fail-Clr	Incident above disappears
101	Manual Transfer to INV	Transfer to inverter manually

Index	LCD Display	Explanation
102	Input Over Curr Tout	Input over current timeout
103	Input Over Curr Tout-Clr	Incident above disappears
104	No Inlet Temp. Sensor	The inlet temperature sensor is not connected
105	No PFC Temp. Sensor	The PFC temperature sensor is not connected
106	No Outlet Temp. Sensor	The outlet temperature sensor is not connected
107	No REC Temp. Sensor	The REC temperature sensor is not connected
108	Inlet Over Temp.	Inlet temperature is too high
109	Inlet Over Temp.-Clr	Incident above disappears
110	No INV Temp. Sensor	The INV temperature sensor is not connected
111	Charger Fan Expired	Charger fan is expired and suggest to replacement
112	Charger Fan Expired-Clr	Incident above disappears
113	Fan Expired	Main fan is expired and suggest to replacement
114	Fan Expired-Clr	Incident above disappears
115	ECO Volt out of range	The bypass voltage is out of ECO range
116	ECO Volt in range	The bypass voltage is back to ECO range
117	ECO Freq out of range	The bypass frequency is out of ECO range
118	ECO Freq in range	The bypass frequency is back to ECO range
119	Battery Expired	Battery is expired and suggest to replacement
120	Battery Expired-Clr	Incident above disappears
121	Firmware Ver. Error	Firmware version are incompatible
122	Firmware Ver. Error-Clr	Incident above disappears
123	Utility Sequence Err	Utility voltage sequence is reversed
124	Utility Sequence Err-Clr	Incident above disappears
125	DC Bus Under Volt	DC bus voltage is too low
126	DC Bus Under Volt-Clr	Incident above disappears
127	DC Bus Unbalance	DC bus voltage is unbalanced
128	DC Bus Unbalance-Clr	Incident above disappears

3.3.4 Setting

Touch the “SETTING” button, and the screen enters the page of the Setting-LOGIN, as it is shown in Fig.3-10.

ADMIN: Full authority, provide all parameters setting for installer.

USER: Limited authority, only GENERAL & DISPLAY items can be set.

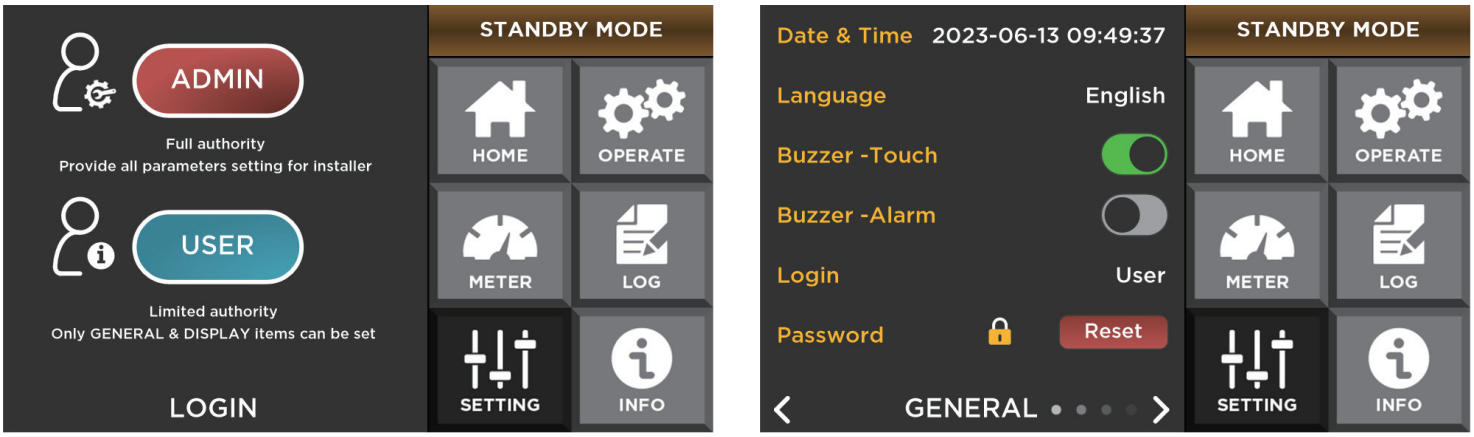


Fig.3-10 Setting page

There are several icons to indicate the setting available status:

: The lock icon means this item need the ADMIN authority

: The forbidden icon means this item need to be set @ Bypass or no output mode

The submenus are listed on the bottom side of the “Setting” page. Users can enter each of the setting interfaces by touching the relevant icon. The submenus are described in details below in Table 3.6.

Table 3.6 Description of each submenu of Setting

CAT.	SET UP ITEMS	AVAILABLE SETTINGS	DEFAULT
GENERAL	Date & Time setting	Setting date & time with YY/DD/TT format	--
	Language selection	[English] [繁體中文] [Русский] [Deutsch] The setting taking action immediately after touching the language icon	English
	Buzzer Touch	[Enable] [Disable] Buzzer sound when panel has been touched	Enable
	Buzzer Alarm	[Enable] [Disable] Buzzer sound when UPS sounds the alarm	Enable
	Login	[Admin] [User] Display the current roles	User
	Password	Change the password of ADMIN (Original ADMIN password is required)	--
	Modbus ID	[1] [2] [3] ..... [255] Setting the Modbus address	1
	Modbus Mode	[RTU] [ASCII] Setting protocol mode for Modbus	RTU
	Modbus Speed	[1200] [2400] [4800] [9600] [19200] [38400] bps Setting the baud rate of RS485 for Modbus	38400
	RS232 Speed	[1200] [2400] [4800] [9600] [19200] [125k] bps Setting the baud rate of RS232	125k
	Restore Defaults	Restore the following setting to default (ADMIN password is required)	--

Chapter 3 LCD Panel

CAT.	SET UP ITEMS	AVAILABLE SETTINGS	DEFAULT
GENERAL	Event Log Data	Clear the event log data	--
DISPLAY	LCD Tower Mode	[Enable] [Disable] Enable the LCD screen with tower mode	Enable
	LCD Backlight Saving	[Enable] [Disable] Enable to turn off LCD after idle for backlight time	Disable
	LCD Backlight Time	[10] ..... [250] seconds	10
	LCD Brightness	[1] [2] [3] ..... [64] LCD Brightness level	64
SYSTEM	Power Strategy	[Normal] [ECO] [CVCF] Set [ECO] to run energy conserving mode if the utility is stable Set [CVCF] to run frequency converter mode	Normal
	Output Voltage Set	[220] [230] [240] V Setting the Output Voltage	230
	Output Frequency Set	[50] [60] Hz Setting the Output Frequency Only available at CVCF mode	60
	Bypass Voltage Range	[±5%] [±10%] [+10, -15%] Setting the Bypass working voltage range	+10, -15%
	Bypass Frequency Range	[±10%] [±20%] Setting the Bypass working frequency range	±10%
	Cold Start	[Enable] [Disable] Allow UPS startup at battery mode	Enable
	Auto Restart	[Enable] [Disable] Allow UPS auto-restart to Line mode when AC comes back in tolerance after UPS has been shut down due to end of discharge	Enable
	Auto Start	[Enable] [Disable] Allow UPS automatic start to Line mode when AC is in tolerance after UPS has been shut down	Enable
	Start On Bypass	[Enable] [Disable] Startup UPS with Bypass mode first, then turn to Line mode Used to start “aggressive” loads through bypass	Enable
	Startup Delay	[30] [60] [150] [300] seconds Setting the startup countdown delay when the “Auto Start” or “Auto Restart” is activated	30
	Shutdown Delay	[30] [60] [150] [300] seconds Setting the shutdown countdown delay after end of discharge	300

Chapter 3 LCD Panel

CAT.	SET UP ITEMS	AVAILABLE SETTINGS	DEFAULT
SIGNAL	Dry Out (J1)	[Disable] [Battery Low] Enable the dry output signal for “Battery Low”	Disable
	Dry Out (J2)	[Disable] [UPS Fault] Enable the dry output signal for “UPS Fault”	Disable
	Dry Out (J3)	[Disable] [UPS Alarm] [On Battery] [On Bypass] [EPO Trip] Enable the dry output signal for the specific situation	Disable
	Dry In (J4)	[Disable] [ROO][MBS] Set [ROO] to enable the remote on/off function Power on by shorting the terminal Power off by opening the terminal The power on/off command & button on front panel will be disabled when set to [ROO] Set [MBS] to receive the external maintenance bypass switch signal, which is normally open	Disable
	EPO	[Disable] [NO] [NC] Set [NO] to trip EPO by shorting the terminal Set [NC] to trip EPO by opening the terminal	NC
BATTERY	Battery Type	[20pcs x 12V] [18pcs x 12V] [16pcs x 12V] Setting the battery module composition	20pcs x 12V
	Battery Capacity	[8] [9] ..... [100] Ah Setting of the Ah of the battery module	9
	Battery Quantity	[1] [2] [3] ..... [10] sets Setting the quantity of the battery module	2
	Float Charge Voltage	[2.25] [2.26] ..... [2.30] V Setting the floating Voltage per cell	2.30
	Max. Charge Current	[1.0] [1.1]..... [12.0] A Setting the maximum charge current	3.6

CAT.	SET UP ITEMS	AVAILABLE SETTINGS	DEFAULT
PARALLEL	Parallel Mode	[Enable] [Disable] Enable the UPS parallel operation	Disable
	Parallel ID	[UPS1] [UPS2] [UPS3] [UPS4] Setting the role of the parallel system	UPS1
	Parallel Quantity	[1] [2] [3] [4] Qty. Setting the total units of the parallel system	1
SERVICE	UPS installation	Time-stamp of the first on-site installation	--
	UPS maintenance	Time-stamp of the last maintenance bypass switch triggered	--
	Battery replacement	Time-stamp of the last battery replacement	--

Table 3.7 Setting allowable list for each operation mode

CAT.	SET UP ITEMS	No Output	Bypass	Line	ECO	CVCF	Battery
GENERAL	Date & Time setting	Y	Y	Y	Y	Y	Y
	Language selection	Y	Y	Y	Y	Y	Y
	Buzzer Touch	Y	Y	Y	Y	Y	Y
	Buzzer Alarm	Y	Y	Y	Y	Y	Y
	Login	Y	Y	Y	Y	Y	Y
	Password	Y	Y	Y	Y	Y	Y
	Modbus ID	Y	Y	Y	Y	Y	Y
	Modbus Mode	Y	Y	Y	Y	Y	Y
	Modbus Speed	Y	Y	Y	Y	Y	Y
	RS232 Speed	Y	Y	Y	Y	Y	Y
	Restore Defaults	Y					
	Event Log Data	Y	Y	Y	Y	Y	Y
DISPLAY	LCD Tower Mode	Y	Y	Y	Y	Y	Y
	LCD Backlight Saving	Y	Y	Y	Y	Y	Y
	LCD Backlight Time	Y	Y	Y	Y	Y	Y
	LCD Brightness	Y	Y	Y	Y	Y	Y
SYSTEM	Power Strategy	Y					
	Output Voltage Set	Y					
	Output Frequency Set	Y					
	Bypass Voltage Range	Y					
	Bypass Frequency Range	Y					
	Cold Start	Y					
	Auto Restart	Y					
	Auto Start	Y					
	Start On Bypass	Y					
	Startup Delay	Y					
	Shutdown Delay	Y					
SIGNAL	Dry Out (J1)	Y					
	Dry Out (J2)	Y					
	Dry Out (J3)	Y					
	Dry In (J4)	Y					
	EPO	Y					

Chapter 3 LCD Panel

CAT.	SET UP ITEMS	No Output	Bypass	Line	ECO	CVCF	Battery
BATTERY	Battery Type	Y					
	Battery Capacity	Y					
	Battery Quantity	Y					
	Float Charge Voltage	Y					
	Max. Charge Current	Y					
PARALLEL	Parallel Mode	Y					
	Parallel ID	Y					
	Parallel Quantity	Y					
SERVICE	UPS installation	Y					
	UPS maintenance	Y					
	Battery replacement	Y					

3.3.5 Info

System “INFO” window displays the S/N, Model Name, Firmware version, and so on, as is shown in the following Fig.3-11.

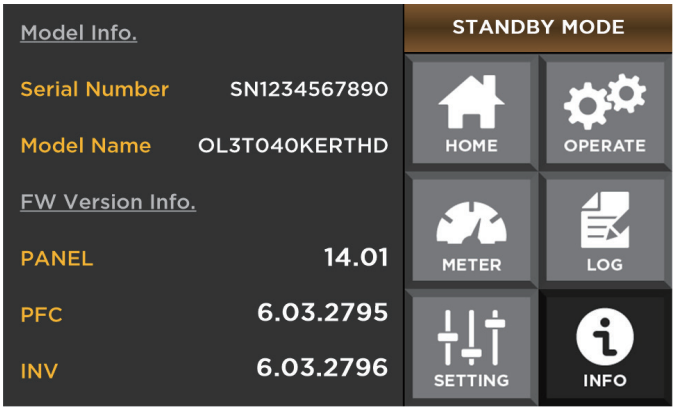


Fig.3-11 Info page

3.3.6 Operate

Touch the “OPERATE” button, and the screen enters the page of the “Operate”, as it is shown in Fig.3-12.

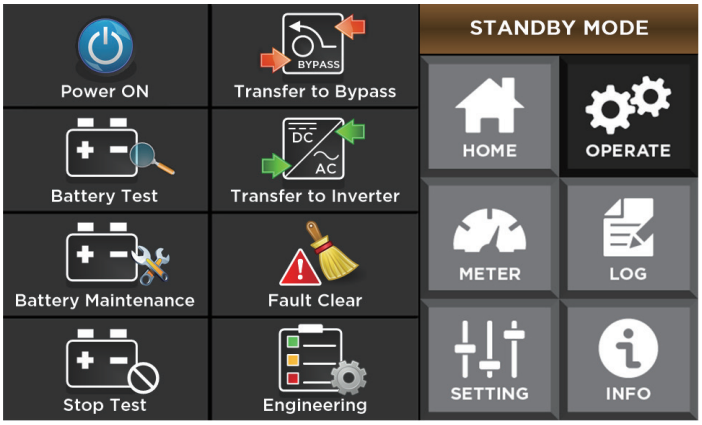


Fig.3-12 Operate page

OPERATE COMMAND

- **Power ON**
  Manual turn ON UPS @ No output mode
- **Power OFF**
  Manual turn OFF UPS @ output mode (ex: Bypass, Line, ECO, CVCF, Battery)

⚠	**Attention:** Executing "Power OFF" will cause the UPS to lose power.

- **Transfer to Bypass**
  Transfer to bypass mode by touching the button
- **Transfer to Inverter**
  Transfer the bypass mode to Inverter Mode by touching the button
- **Battery Test**
  The system transfers to the battery mode to test the condition of the battery.
  The following condition are required to execute the battery test
  1. UPS mode: Must be @ Line or ECO or CVCF mode
  2. Battery SOC > 80%
  3. Load > 10%
  4. No other warning alarms

- **Battery Maintenance**
  The system transfers to the battery mode. This function is used for maintaining the battery.
  The following condition are required to execute the battery test
  1. UPS mode: Must be @ Line or ECO or CVCF mode
  2. Battery SOC > 80%
  3. Load > 10%
  4. No other warning alarms
- **Stop Test**
  By touching the button, the system stops battery test or battery maintenance.
- **Fault Clear**
  After remove the fault condition, press this button to back to Standby mode
- **Engineering**
  Reserve for the installer used

CONFIRMATION MESSAGE BOX

The above operation request button will pop-out the corresponding message box.

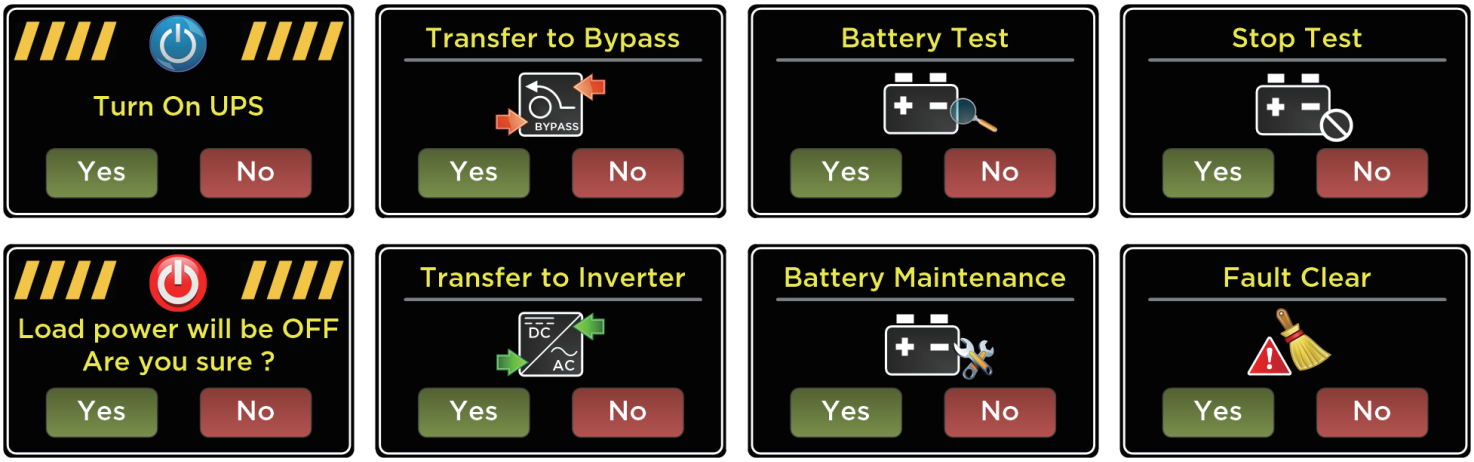


Fig.3-13 Confirmation message box

OPERATION DENIED

If the operation cannot be executed for some reason, the following pop-out window will be shown on the display.

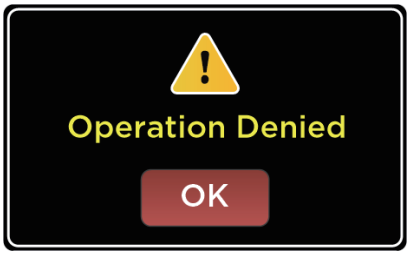


Fig.3-14 Operation Denied

3.4 Alarm

There are two different types of audible alarm during UPS operation, as shown in Table Table 3.8.

Table 3.8 Description of audible alarm

Type	Description
Periodic short alarm	When system has general alarm (for example: AC fault)
Continuous alarm	When system has serious faults (for example: Hardware fault)

Chapter 4 Operations

4.1 UPS Start-up

The UPS must be started up by commissioning engineer after the completeness of installation. The steps below must be followed**:**

1. Ensure all the circuit breakers are open.
2. Ensure to plug the EPO connector.
3. Close the output circuit breaker (CB) and then the input CB and the system starts initializing. If the system has dual inputs, close both of the breakers.
4. The LCD in front of the UPS is light up.
5. If the UPS is first start-up, the LCD will enter the guidance page, as shown in Fig.4-1. Otherwise, the system will show the welcome page then enters the home page, as shown in Fig.3-2.

4.1.1 First Start-up Guidance

If the UPS is the first start-up after installation, the specific parameters have to be set before start-up to line mode.

Since the UPS systems can be installed in a rackmount or vertical/tower orientation, the first page will be shown in Fig.4-1 to guide the user to select the corresponding display orientation.

Fig.4-1 Interface of display orientation set

After that, the second page will be shown in Fig.4-2 with the proper orientation (Rack or Tower). At this page, the following parameters have to be set and confirmed.

SET UP ITEMS	AVAILABLE SETTINGS
Date & Time setting	Setting date & time with YYYY-MM-DD HH:MM:SS format
Language selection	[English] [繁體中文] [Русский] [Deutsch] The setting taking action immediately after touching the language icon
Battery Type	[20pcs x 12V] [18pcs x 12V] [16pcs x 12V] Setting the battery module composition
Battery Capacity	[8] [9] ..... [100] Setting of the Ah of the battery module
Battery Quantity	[1] [2] [3] ..... [10] sets Setting the quantity of the battery module
Start On Bypass	[Enable] [Disable] Startup UPS with Bypass mode first, then turn to Line mode Used to start “aggressive” loads through bypass
Output Voltage Set	[220] [230] [240] V Setting the Output Voltage

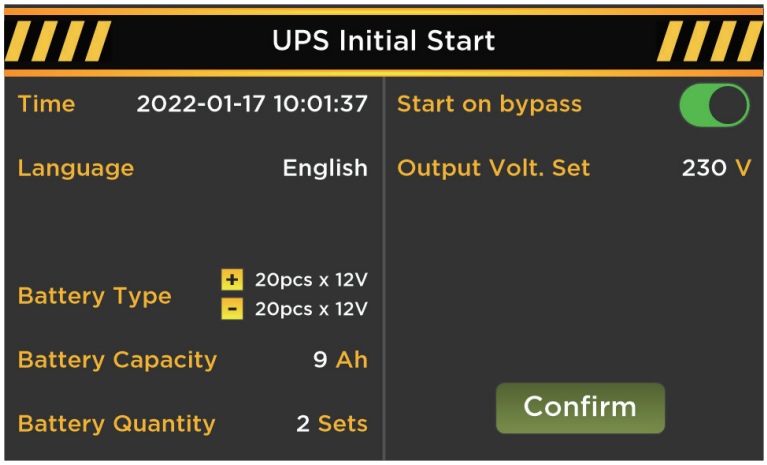


Fig.4-2 Interface of initial start-up parameters set

After finishing the parameters setting, select “Confirm” and then “Yes”, the UPS systems will restart and show the welcome page then enter to the home page.
Now, the UPS system is in standby mode and ready to start.

Note
If the UPS system is first start-up, the cold start (start from battery) is forbidden. Only start from line mode is allowable.

4.1.2 Start from Line Mode

1. To Start the UPS, enter the “OPERATE” page and push the “Power ON” command as show in Fig.4-3. After receiving the command, the UPS will proceed start-up.

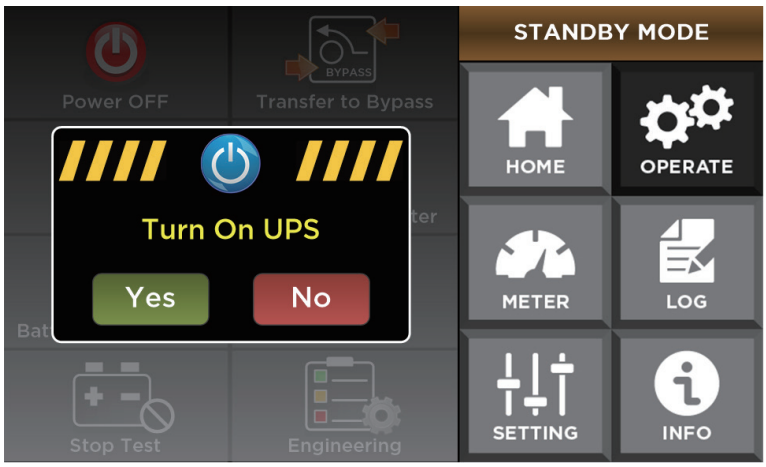


Fig.4-3 Interface of start-up operation

2. During the first 30S, the rectifier starts to charge the DC bus from AC grid. As shown in Fig.4-4

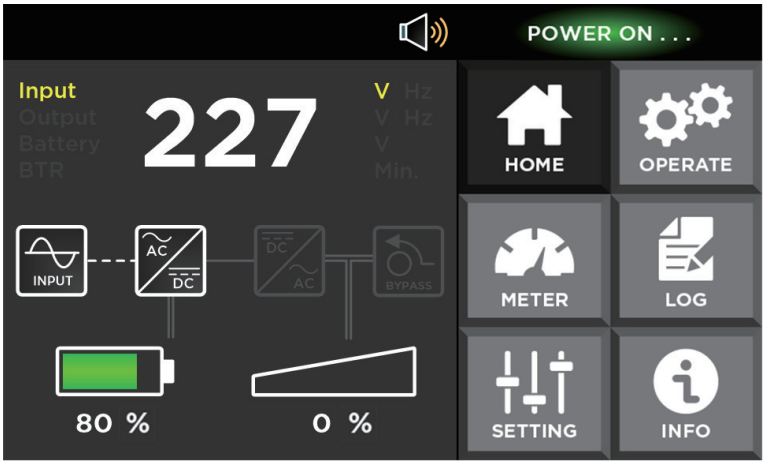


Fig.4-4 Interface of AC soft starting

3. After about 10S, when the inverter is running normally, the UPS turns on the inverter relay to output the voltage and enters to Line mode operation. As shown in Fig.4-5.

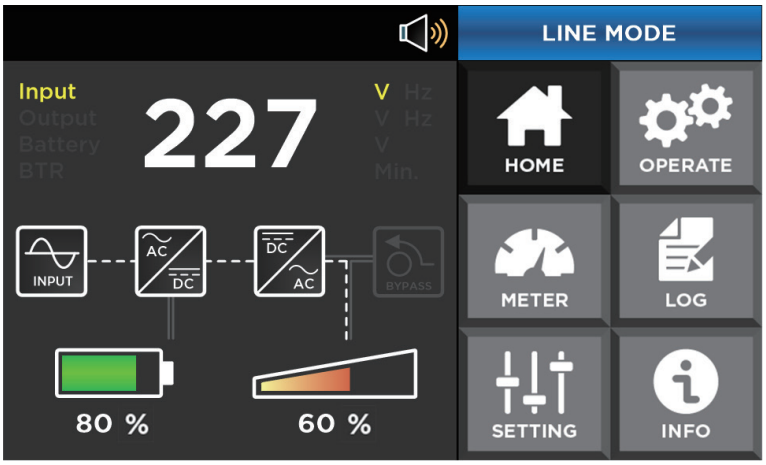


Fig.4-5 Interface of inverter starting

4. After about 20S, when the charger self-check is running normally, the UPS switches on the charger relay to charge the battery. As shown in Fig.4-6.

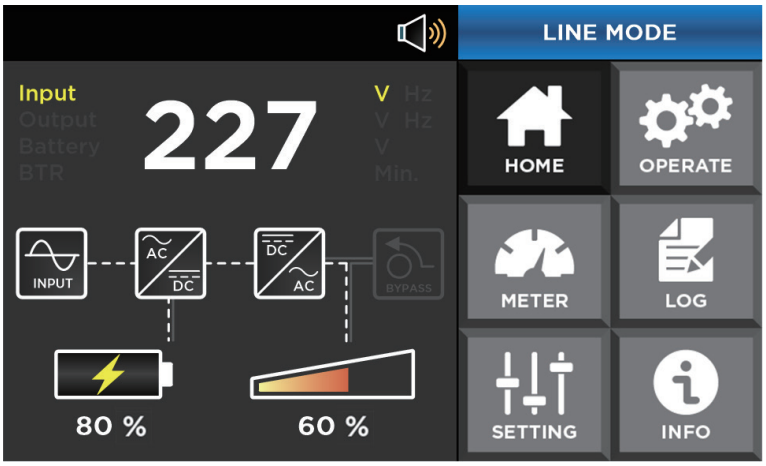


Fig.4-6 Interface of Line mode

4.1.3 Start from Battery

The start for battery model is referring to battery cold start. The steps for the start-up are list as follows**:**

1. Confirm the battery is correctly connected.
2. Press the cold start button for the battery cold start (See Fig.4-7). The system is then powered by the battery. The LCD in front of the UPS is light up

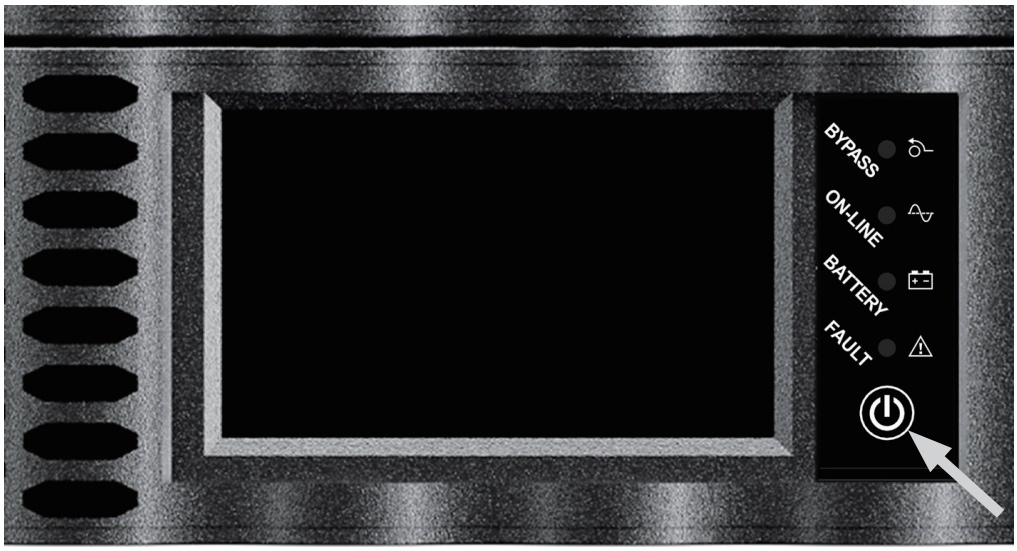


Fig.4-7 The position of the battery cold start button

3. Follow the step 1 in section 4.1.2 (See Fig.4-3), the system will enter the start-up process. After about 30S, the system transfers to battery mode.
4. Close the output isolation switch or external output isolation switch to supply the load, and the system is working on battery mode. As shown in Fig.4-8

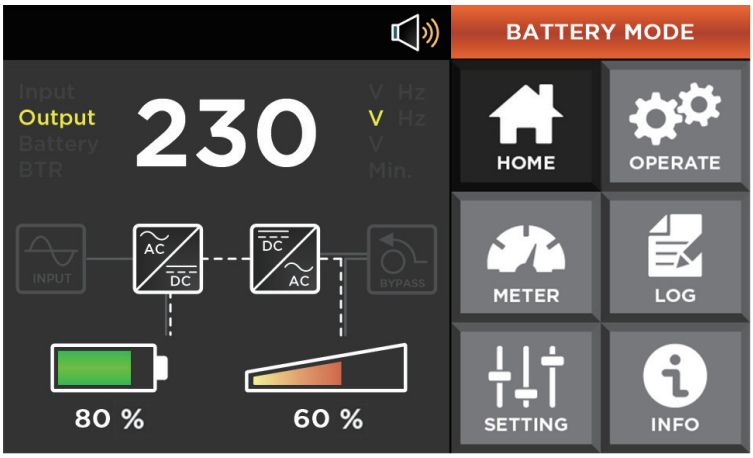


Fig.4-8 Start from Battery

Note

The cold start button also has the following function:

@ Standby mode: Press and hold 5 seconds, turn on UPS

@ Line mode: Press and hold 5 seconds, turn to bypass

@ Bypass mode: Press and hold 5 seconds, turn to inverter

4.2 Procedure for Switching between Operation Modes

4.2.1 Switching the UPS into Battery Mode from Line Mode

The UPS transfers to Battery Mode immediately when the input circuit breaker disconnects from the utility or when there are voltage drops and fluctuations in the mains supply.

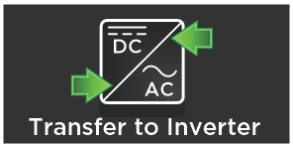
4.2.2 Switching the UPS into Bypass Mode from Line Mode

Access the "Operate" interface and select 

to transfer the system to Bypass Mode. Or, press the  icon and sustain this action for 5 seconds to switch to Bypass mode.

	**Warning:** Ensure the bypass is working normally before transferring to bypass mode. Or it may cause failure.

4.2.3 Switching the UPS into Line Mode from Bypass Mode

Access the "Operate" interface and select 

to transfer the system to Line Mode. Or, press the  icon and sustain this action for 5 seconds to switch to Line mode (Inverter Mode).

Note
Normally, the system will transfer to the Line mode automatically. This function is used when the bypass mode is switched by manual and the system needs to transfer to Line mode by manual.

4.2.4 Switching the UPS into Maintenance Bypass Mode from Line Mode

When the UPS fault and must replace the boards, following this procedure to make sure the power uninterrupted.

1. Transfer the UPS into Bypass mode following chapter 4.2.2.
   The bypass will supply power to the load, and the inverter will stop supplying power.
2. Turn off (Open) the external battery breaker.
   a. Turn on (Closed) the external maintenance bypass breaker then Turn off (Open) UPS O/P breaker for dual input model.
   b. Switch internal manual bypass to Bypass for single input model.
   The load is powered that would from static switch bypass to maintenance bypass.
3. Turn off (Open) the external I/P NFB for dual input mode or internal I/P NFB for single input model.
   The load is powered from maintenance bypass, and the UPS into the shutdown mode.

4.2.5 Switching the UPS into Line Mode from Maintenance Bypass Mode

After the maintenance is done, following this procedure to make sure the power uninterrupted.

1. Turn on (Close) the external I/P NFB for dual input mode or internal I/P NFB for single input model. The UPS is into standby mode. Transfer the UPS into Bypass mode following chapter 4.2.2
2. Turn on (Close) the external battery breaker.
   a. Turn on (Close) UPS O/P breaker then turn off (Open) the external maintenance bypass breaker for dual input model.
   b. Switch internal manual bypass to UPS for single input model.
      The load is powered that would from maintenance bypass to static switch bypass.
3. Transfer the UPS into Inverter mode following chapter 4.2.3.
   The Inverter will supply power to the load, and the Bypass will stop supplying power.

Chapter 4 Operations

4.3 Battery Maintenance

If the battery is not discharged for a long time, it is necessary to test the condition of the battery.

Enter the menu “Operate” and select the icon 

the system transfers into the Battery mode for discharging. The system will discharge the batteries until the alarm of “Battery low voltage” is given.

With the icon of 

, batteries will be discharged for about 10 seconds, and then re-transfer to Line mode.

Users can stop the discharging by the 

icon.

4.4 Installation of Parallel Operation System

4.4.1 Parallel system diagram

Up to four UPS could be paralleled**,** with a diagram as shown in Fig.4-9a & Fig.4-9b.

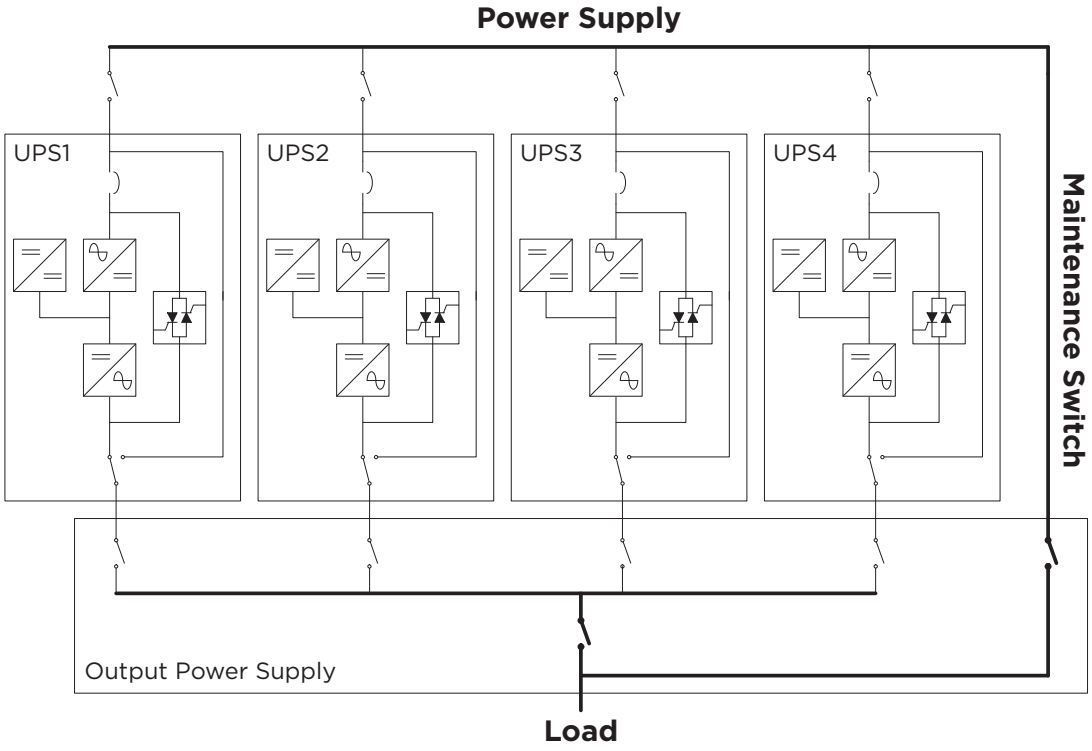


Fig. 4-9a Parallel diagram (Stand-alone Tower _ Single input)

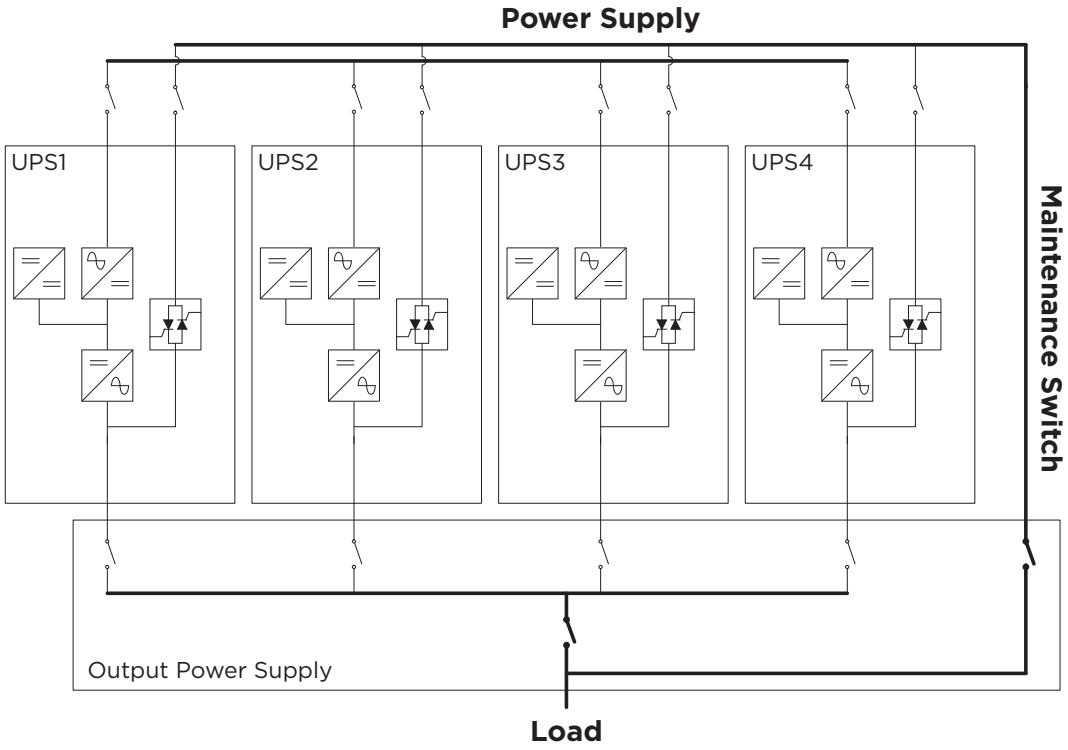


Fig. 4-9b Parallel diagram (Rack-mountable _ Dual input)

Attention:
When replacing the UPS, please switch to Maintenance Switch loop. This is to ensure load stability and safe replacement.

The parallel board is located at the back of the UPS cabinet, as is shown in Fig.4-10.

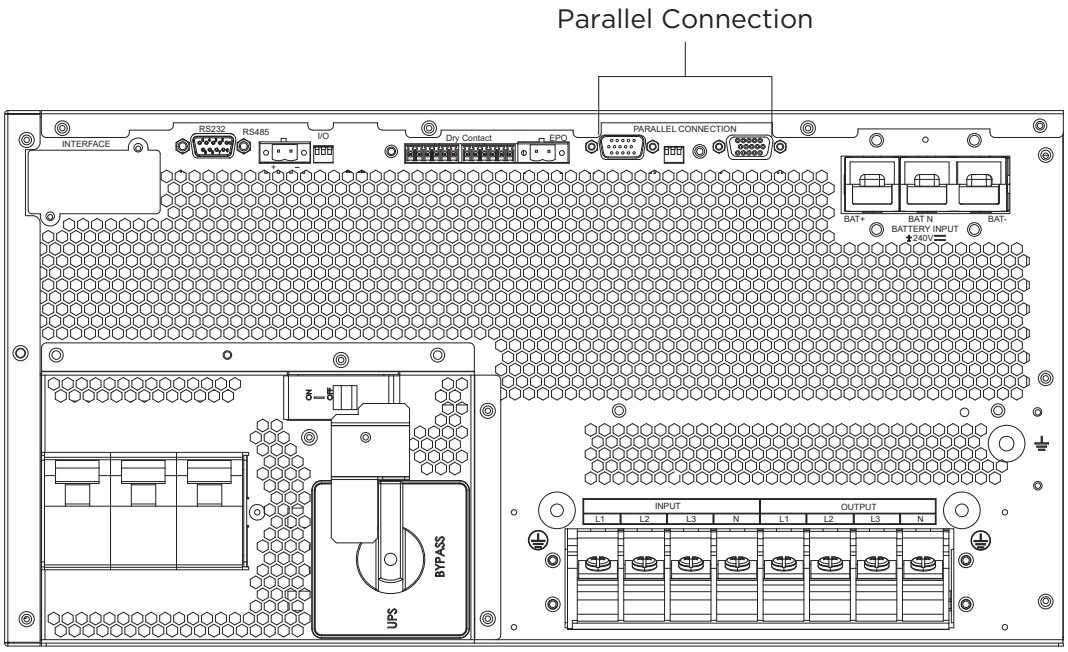


Fig.4-10a Location of the Parallel board (Stand-alone Tower _ Single input)

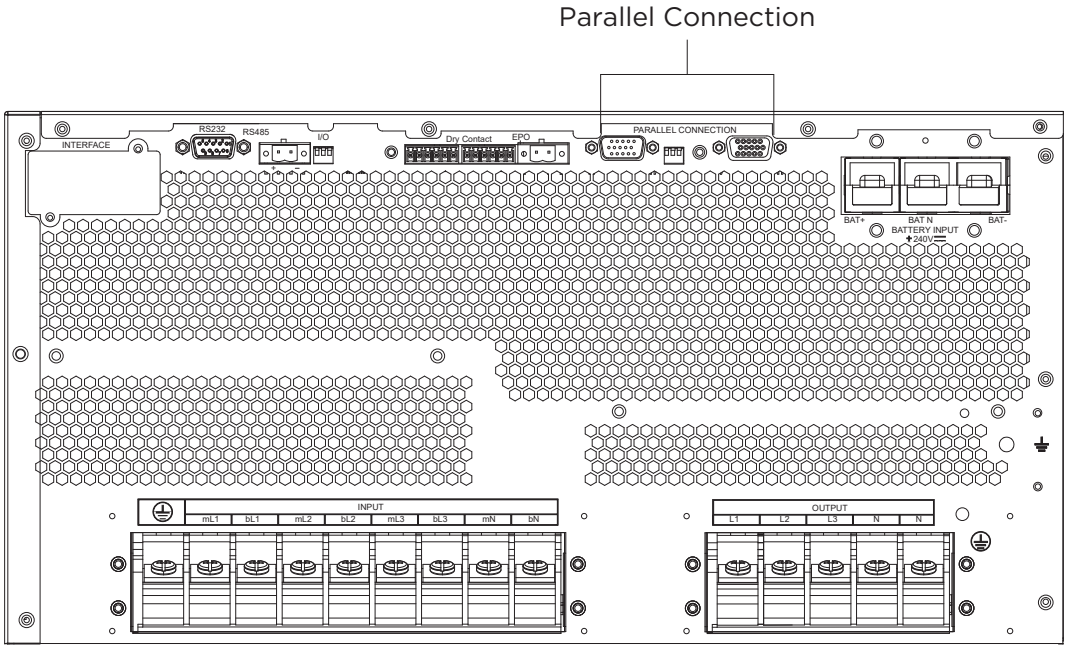


Fig.4-10b Location of the Parallel board (Rack-mountable_Dual input)

All the parallel cables are designed to be shielded and double insulated, and are connected between the UPS to form a loop as shown below in Fig.4-11.

@ Parallel cables is Optional kit.

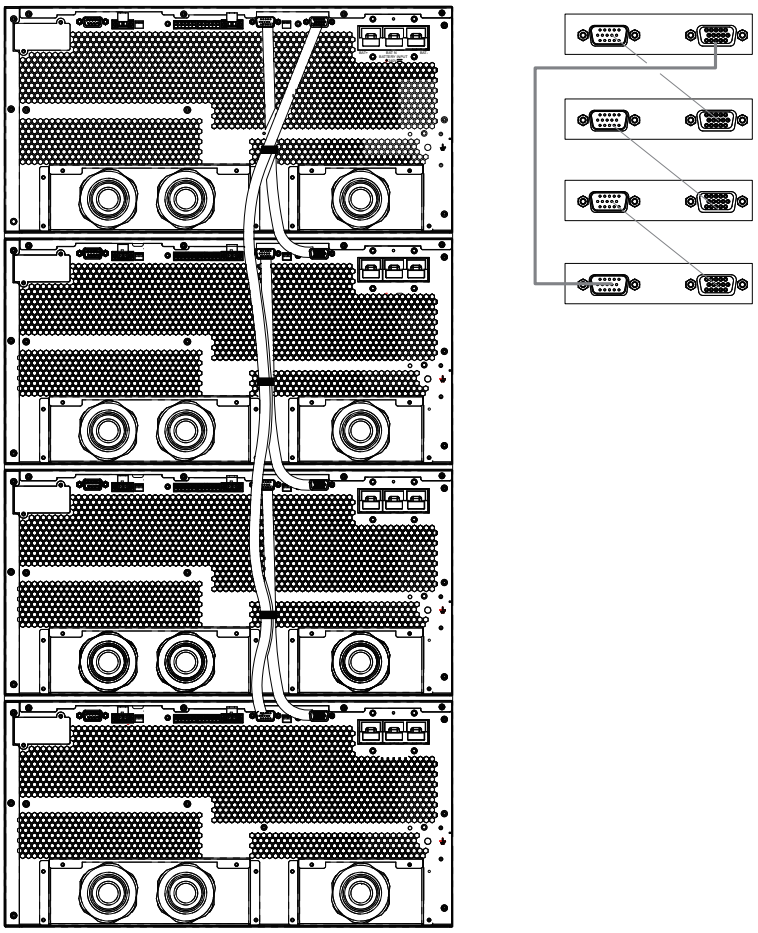


Fig.4-11 Parallel connection

4.4.2 Parallel system setting

Parallel system connection

For field installation, please connect the cables according to Fig.4-9 and Fig.4-11.

In order to assure that all units are equally utilized and to comply with relevant wiring rules, the following requirements apply:

1. All units shall be of the same rating.
2. The main input sources must be referenced to the same neutral potential.
3. Any RCD (Residual Current detecting device), if installed, must be of an appropriate setting and located upstream of the common neutral bonding point. Alternatively, the device must monitor the protective earth currents of the system. Refer to the High Leakage Current Warning in the first part of this manual.
4. The outputs of all UPS must be connected to a common output bus.

Parallel system setting of Parallel board

There is different setting of the DIP Switch on the parallel board for different parallel system.

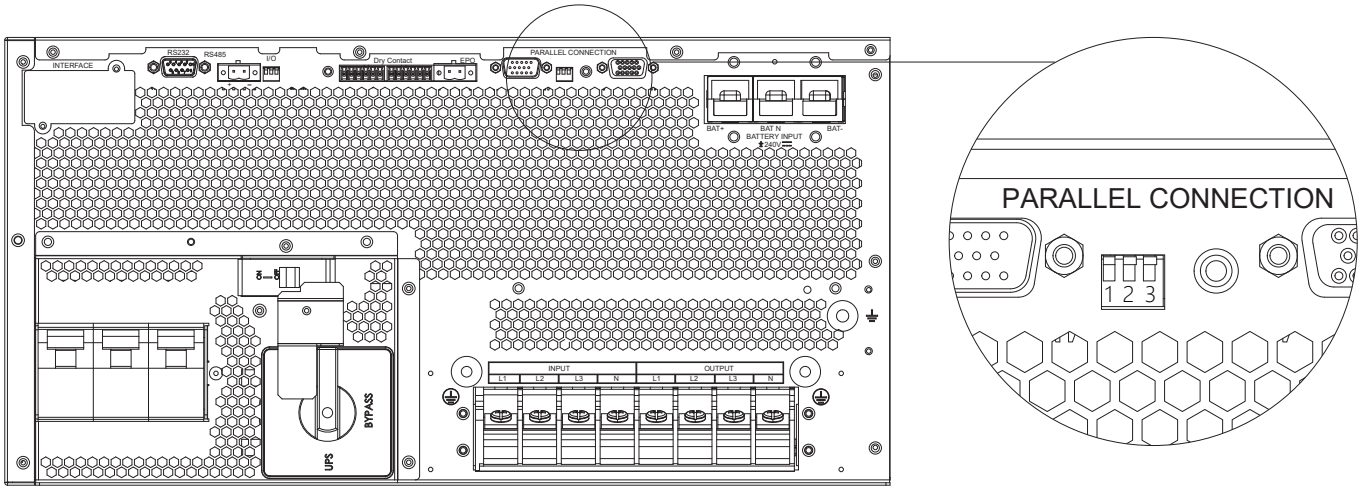


Fig.4-12a Connectors on Parallel board (Stand-alone Tower _ Single input)

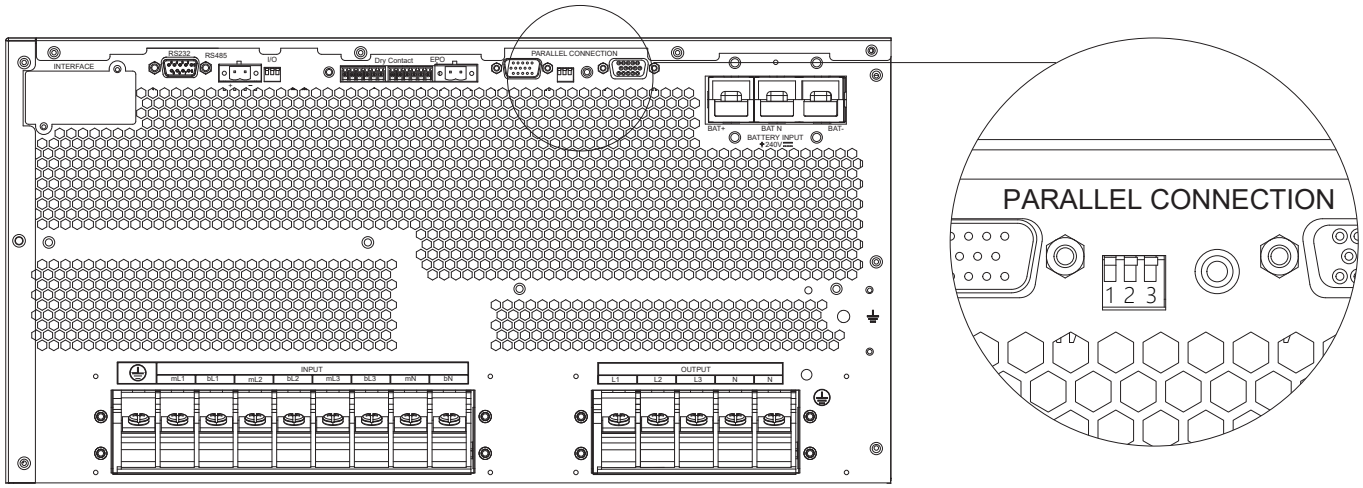


Fig.4-12b Connectors on Parallel board (Rack-mountable _ Dual input)

Chapter 4 Operations

Parallel boards settings

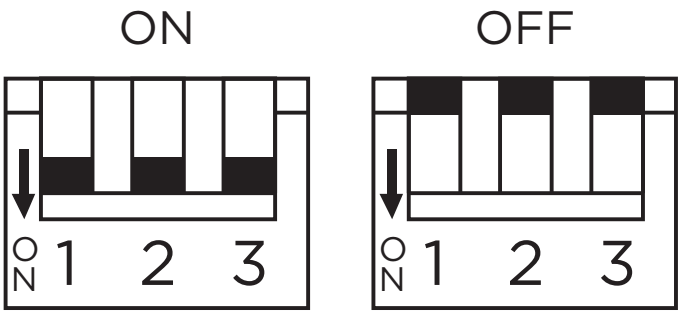


Fig.4-13 DIP Switch ON/OFF State diagram

OL3T040KERTHDS can be installed maximum 4 units in parallel to provide 160KVA capacity, before installing please check the parallel dip switch setting is following below table:

	UPS Parallel ID			
Parallel Qty.	**UPS 1**	**UPS 2**	**UPS 3**	**UPS 4**
2	ON	ON	X	X
3	ON	OFF	ON	X
4	ON	OFF	OFF	ON

Table.4-1 Parallel Dip Switch Setting

A. For Single UPS, DIP Switch ON.

B. For two UPS in parallel. UPS1 : ON & UPS2 : ON.

C. For Three UPS in parallel. UPS1 : ON & UPS2 : OFF & UPS3 : ON.

D. For Four UPS in parallel. UPS1 : ON & UPS2 : OFF & UPS3 : OFF & UPS4 : ON.

Parallel system setting of LCD Panel

To change the parallel system setting, please follow the steps below.

(The Parallel function setting needs to be run with administrator rights.)

1. LCD select the page of “SETTING” and press “ADMIN” as shown in Fig.4-14. (Login to the administrator for setting)

Fig.4-14 Login with ADMIN

2. At page of “PARALLEL”. Set “Parallel Mode” to “Parallel”, and set the “Parallel Qty” to the number of units in parallel. For the setting of system ID with a system of 2 units in parallel, for example, set the “Parallel ID” to “UPS1” and “UPS2” for each unit. Here the LCD setting is done.

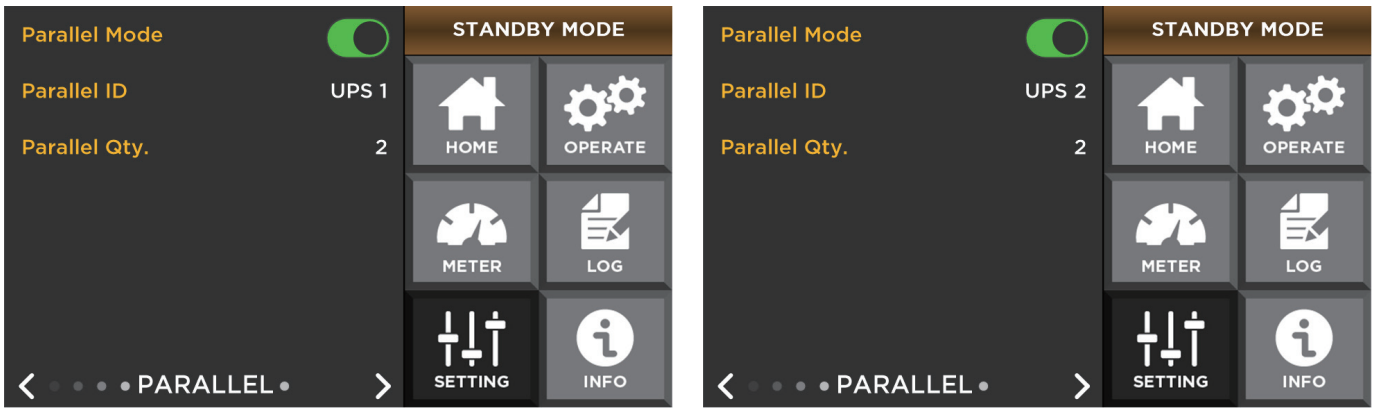


Fig.4-15 Parallel setting

3. Turn On Parallel system. At “UPS 1” Unit, select the page of “OPERATE” and press “Power On/off” as shown in Fig.4-16. And then... Other Parallel Unit will turn ON with UPS 1 together.

Fig.4-16 Parallel startup

Chapter 5 Maintenance

This chapter introduces UPS maintenance method.

5.1 Precautions

1. Only certified engineers are authorized to maintain the UPS.
2. To ensure the safety before maintaining, measure the voltage between operating parts and the earth with multi-meter to ensure the voltage is lower than hazardous voltage, i.e. DC voltage is lower than 60Vdc, and AC maximum voltage is lower than 42.4Vac.
3. Wait 10 minutes before opening the cover of UPS Unit.

5.2 Instruction for Maintaining UPS _ Single input (Standalone Tower)

1. Transfer to Bypass mode (refer to chapter 4.2.2) then remove Maintenance Cover.
2. Turn Maintenance SW to "Bypass" and Neutral SW to "Off".
3. Certified engineers can maintenance machine without interrupting the output load.
4. After maintenance machine, turn Maintenance SW to "UPS" and Neutral SW to "ON".
5. UPS into Line Mode from Maintenance Bypass mode (refer to chapter 4.2.4).

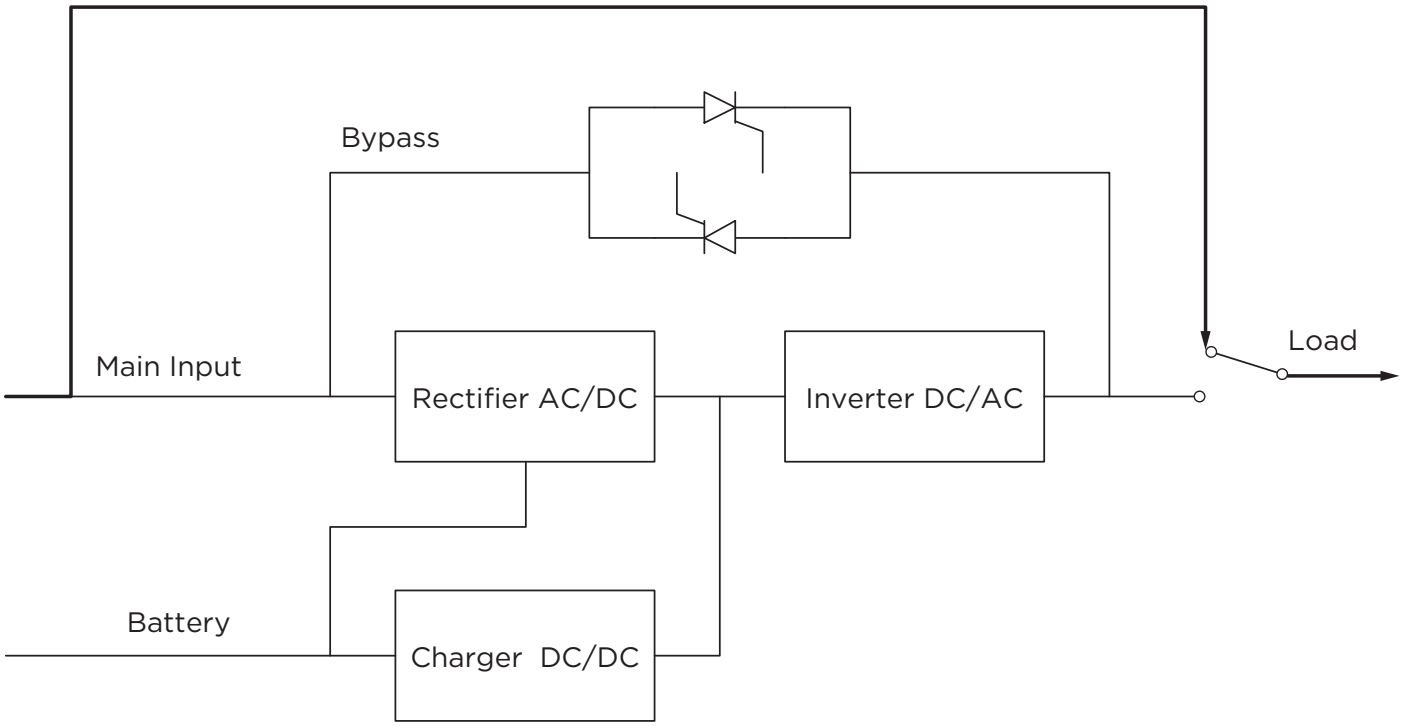


Fig.5-1 Maintenance mode operation diagram

5.3 Instruction for Maintaining Battery string

For the Lead-Acid maintenance free battery, when maintenance the battery according to requirements, battery life can be prolonged. The battery life is mainly determined by the following factors:

6. Installation. The battery should be placed in dry and cool place with good ventilation. Avoid direct sunlight and keep away from heat source. When installing, ensure the correct connection to the batteries with same specification.
7. Temperature. The most suitable storage temperature is 20 ºC to 25ºC. The battery life will be shortened if the battery is used under high temperature or in deep discharging status. Refer to product manual for details.
8. Charging/discharging current. The best charging current for the lead-acid battery is 0.1C .The maximum current for the battery can be 0.3C.The suggested discharging current is 0.05C-3C.
9. Charging voltage. In most of the time, the battery is in standby state. When the utility is normal, the system will charge the battery in boost mode (Constant voltage with maximum limited) to full and then transfers to the state of float charge.
10. Discharge depth. Avoid deep discharging; which will greatly reduce the life time of the battery. When the UPS runs in battery mode with light load or no load for a long time, it will cause the battery to deep discharge.
11. Check periodically. Observe if any abnormality of the battery, measure if the voltage of each battery are in balance. Discharge the battery periodically.

Warning:
Daily inspection is very important!
Check and confirm the battery connection is tightened regularly, and make sure there is no abnormal heat generated from the battery.

Warning:
If a battery has leakage or is damaged, it must be replaced, stored in a container resistant to sulfuric acid and disposed of in accordance with local regulations.

The following precautions should be observed when working on batteries:

a) disconnect the charging source prior to connecting or disconnecting battery terminals;

b) do not wear any metal objects including watches and rings;

c) do not lay tools or metal parts on top of batteries;

d) use tools with insulated handles;

e) wear rubber gloves and boots;

f) determine if battery is either intentionally or inadvertently grounded. Contact with any part of a grounded battery can result in electric shock and burns by high short-circuit current. The risk of such hazards can be reduced if grounds are removed during installation and maintenance by a skilled person.

g) servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and required precautions.

h) when replacing batteries, replace with the same type and number of batteries or battery packs.

Chapter 5 Maintenance

CAUTION:

- **Do not dispose of batteries in a fire. The batteries may explode.**
- **Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.**
- **A battery can present a risk of electric shock and burns by high short-circuit current.**
- **Failed batteries can reach temperatures that exceed the burn thresholds for touchable surfaces.**

The waste lead-acid battery is a kind of hazardous waste and is one of the major contaminants controlled by government.

Therefore, its storage, transportation, use and disposal must comply with the national or local regulations and laws about the disposal of hazardous waste and waste batteries or other standards.

According to the national laws, the waste lead-acid battery should be recycled and reused, and it is prohibited to dispose of the batteries in other ways except recycling. Throwing away the waste lead-acid batteries at will or other improper disposal methods will cause severe environment pollution, and the person who does this will bear the corresponding legal responsibilities.

Chapter 6 Product Specification

This chapter provides the specifications of the product, including environmental characteristics mechanical characteristics and electrical characteristics.

6.1 Applicable Standards

The UPS has been designed to conform to the following European and international standards:

Table.6-1 Compliance with European and International Standards

Item	Normative reference
General safety requirements for UPS used in operator access areas	IEC 62040-1/ EN IEC 62040-1/ AS 62040.1/ CNS 14843-1
Electromagnetic compatibility (EMC) requirements for UPSElectromagnetic compatibility (EMC) requirements for UPS	IEC 62040-2/ EN IEC62040-2/ AS IEC 62040.2/ CNS 14757-2 (C3)
Method of specifying the performance and test requirements of UPSMethod of specifying the performance and test requirements of UPS	IEC 62040-3/ EN IEC 62040-3/ AS IEC 62040.3/ CNS 62040-3 (VFI-SS-111)

Warning:
This product conforms the EMC requirements for UPS in Category C3 and it is not suitable for medical equipment.

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

6.2 Environmental Characteristics

Table.6-2 Environmental Characteristics

Item	Unit	Requirements
Acoustic noise level at 1 meter	dB	66dB @ 100% load, 56dB @ 50% load
Altitude of Operation	m	3000m
Relative Humidity	%	0-95 ,Non condensing
Operating Temperature	°C	0-40°C, No de-rating of Load. 41-50°C, De-rating to 80% of Load.
UPS Storage Temperature	°C	-40 ~ 70

Chapter 6 Product Specification

6.3 Mechanical Characteristic

Table.6-3 Mechanical Characteristics for Cabinet

Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Dimension (W×D×H)	mm	433*730*219						
Weight	kg	42.8						
Color	N/A	BLACK,RAL 7021						
Protection Level IEC(60529)	N/A	IP20						

6.4 Electrical Characteristics

6.4.1 Electrical Characteristics (Input Rectifier)

Table.6-4 Rectifier AC input Mains

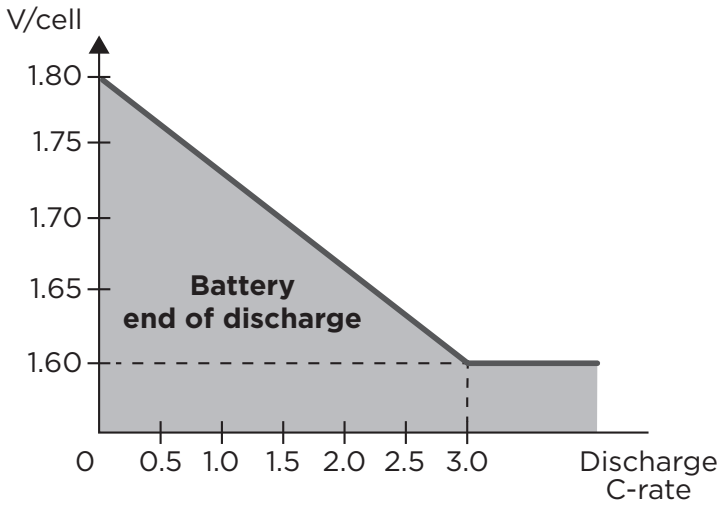
Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Grid System	\	3 Phases + Neutral + Ground						
Rated AC Input Voltage	Vac	380/400/415 (three-phase and sharing neutral with the bypass input)						
Rated Frequency	Hz	50/60Hz						
Input voltage range	Vac	304~478Vac (Line-Line), full load						
Input voltage range	Vac	228V~304Vac (Line-Line),50% load decrease linearly according to the min phase voltage						
Input Frequency range	Hz	40~70Hz						
Input Power factor	PF	> 0.99						
THDI	%	<10%	<6.5%	<5%	<4%	<3%	<2%	

6.4.2 Electrical Characteristics (Intermediate DC Link)

Table.6-5 Battery

Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Battery bus voltage	Vdc	Rated: ±240V						
Quantity of lead-acid cells	Nominal	40 = [1 battery(12V)], 240 = [1 battery(2V)]						
Float charge voltage	V/cell (VRLA)	2.30V/cell (Selectable from: 2.25V/cell ~ 2.30V/cell)						

Chapter 6 Product Specification

Item	Unit	Parameter
Final discharging voltage	V/cell (VRLA)	1.80 VPC at 0.0 Discharge C-rate 1.60 VPC at 3.0 Discharge C-rate
		Linear decrease VPC within 0~3 Discharge C-rate 
Battery Charge	V/cell	2.35V/cell
Battery Charging Power Max Current	Amp	12A User configurable 0.1C~0.3C (Suggest 0.2C)

6.4.3 Electrical Characteristics (Inverter Output)

Table.6-6 Inverter Output (To critical load)

Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Rated AC voltage	Vac	380/400/415Vac (Line-Line)						
Rated Frequency	Hz	50/60Hz						
Frequency Regulation	Hz	50/60Hz±0.1Hz						
Overload	%	102%~110%, 60min; 110%~125%,10min; 125%~150%,1min; >150%,200ms						102%~110% Load: 60 min 110%~115% Load: 10 min 115%~135% Load: 1 min > 135% Load: 200 ms
Synchronized Range	Hz	46 – 54 Hz +/- 0.05 Hz for 50 Hz nominal operation 56 – 64 Hz +/- 0.05 Hz for 60 Hz nominal operation						
Synchronized Slew Rate	Hz/sec	1 Hz per second maximum						

Chapter 6 Product Specification

Item	Unit	Parameter	
Output Power Factor	PF	1	0.88
Transient Response	\	IEC62040-3 Dynamic output performance classification 1	
Output Voltage THDu	%	< 1% THD for linear load < 3% THD for non-linear load	

6.4.4 Electrical Characteristics (Bypass Mains Input)

Table.6-7 Bypass Mains Input

Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Rated AC voltage	Vac	380/400/415Vac (three-phase four-wire and sharing neutral with the bypass)						
Overload	%	Continuous > 100...125% load 10 min > 125...150% load 5 ms, 1000% load Note! Bypass current breaker may limit the overload capability.						Continuous > 100...115% load 10 min > 115...135% load 5 ms, 1000% load Note! Bypass current breaker may limit the overload capability.
Rated frequency	Hz	50/60Hz						
Switch time (between bypass and inverter)	ms	Synchronized transfer: 0ms						
Bypass voltage range	%	If input voltage exceeds the -15%~ +10% nominal voltage						
Bypass frequency range	%	If input frequency exceeds the -10%~ +10% nominal frequency						

Chapter 6 Product Specification

6.5 Efficiency

Table.6-8 Efficiency

Item	Unit	Parameter						
Rated capacity	kVA	10	15	20	25	30	40	45
Line mode	%	95.1%	95.6%	95.6%	95.8%	95.8%		
ECO mode	%	98.3%	98.7%	98.7%	98.9%	98.9%		

6.6 Standard Battery (EBM _ BME480V55ART5U)

Table.6-9 Standard Battery

Item	Unit	Parameter
Battery PCS	PCS	40Pcs
Battery Voltage	V	12V
Battery Current	A	9AH
Battery type		Please ask the installer or CyberPower

6.7 Display and Interface

Table.6-9 Display and Interface

Display	LCD
Interface	Standard: RS232, RS485, Dry Contact Option: SNMP

Chapter 7 Contacts

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

1. Model Name
2. Serial Number
3. Detailed Issue Description

Taiwan, United Kingdom
Cyber Power Systems, Inc.
11F., No.26, Jinzhuang Rd., Neihu Dist., Taipei City 114, Taiwan
Tel: +886 2 8792 9510
Fax: +886 2 8792 9621
Email: tw.service@cyberpower.com, uk.service@cyberpower.com

Europe, Northern Ireland
Cyber Power Systems B.V.
Flight Forum 3545, 5657DW Eindhoven, The Netherlands
Tel: +31 40 2348170
Fax: +31 40 2340314
Email: eu.service@cyberpower.com

Austria, Germany, Switzerland
Cyber Power Systems GmbH
Edisonstrasse 16, 85716 Unterschleissheim, Germany
Telefon: +49 89 1 222 166 0
Fax: +49 89 1 222 166 29
Email: de.service@cyberpower.com

France
Nitram S.A.
Z.I. Saint-Séverin, 28220 CLOYES, FRANCE
Tél : +33 2 37 98 61 50
Fax: +33 2 37 98 60 04
E-mail: infos@nitram.fr

All Other Regions
Please visit our website for local contact information

Chapter 7 Contacts

設備名稱：不斷電系統 Equipment name		型號 (型式) : OL3T040KERTHDS...等，系列清單如附件 Type designation (Type)				
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr+6)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	--	O	O	○	○	○
金屬件	○	○	○	○	○	○
包裝材	○	○	○	○	○	○
外殼類	○	○	○	○	○	○

備考 1.〝超出 0.1 wt %〞及〝超出 0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。
Note 1 : "Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考 2.〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2 : "○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考 3.〝-〞係指該項限用物質為排除項目。
Note 3 : The "--" indicates that the restricted substance corresponds to the exemption.

附表 : 系列型號清單

1. OL3T030KERTHDS
2. OL3T030KERTHD
3. OL3T040KERTHDS
4. OL3T040KERTHD
5. OL3T045KERTHD

Cyber Power Systems, Inc.

www.cyberpower.com

11F., No.26, Jinzhuang Rd., Neihu Dist., Taipei City 114, Taiwan