

ResiPOWER RK Three Phase UPS Installation and Operation Manual

3:3&3:1 10-20kVA UPS

3:3 30-40kVA UPS

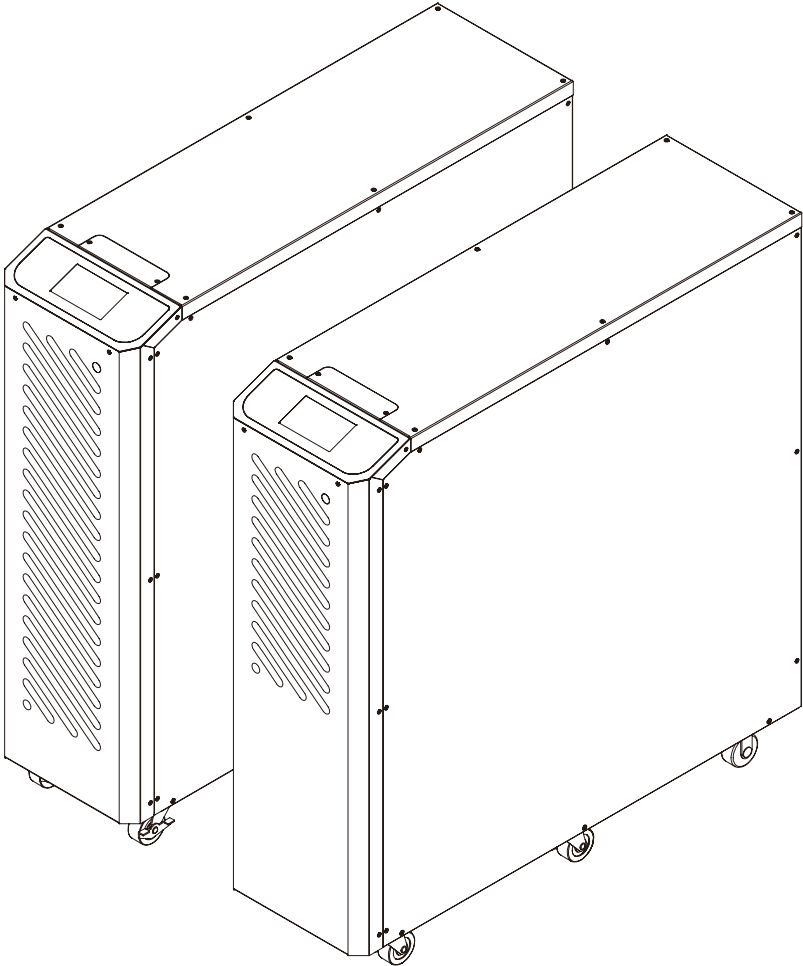


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1. Preface

We thank you for the trust in selecting our UPS.

This equipment has been tested and comply with the European Community directives for Class I electrical device and is authorized to use the CE marking.

The purpose of this manual is to introduce the operating principles of the UPS and to provide instructions for its safe operation. The manual also provides troubleshooting instructions should an abnormal message or behavior occurs. Please contact your local authorized service agent if the abnormal message is not covered in this manual.

The installation, operation, and maintenance of this UPS must be performed by authorized and qualified technicians who are familiar with the installation and operation of electrical equipment.



2. Important Safety Information

Read the instructions carefully to become familiar with the equipment before starting to install.

Notify the carrier and dealer if there is any damage.

	CAUTION indicates a hazardous situation which could result in potential injury or equipment damage, or to caution against unsafe practices.
	DANGER indicates potential electrical hazard which could result in serious injury or death, and special precautions are necessary.

- Adhere to all national and local electrical codes.
 - Always check that the supply source voltage is same as the UPS operating voltage.
 - All wiring must be performed by a qualified electrician.
 - Changes and modifications to this unit could void the warranty.
 - This UPS is intended for indoor use only with ambient temperature between 0-40°C and ≤95% non-condensing humidity.
 - * This product can not be used as a power supply for any life support devices.
 - Do not operate this UPS in direct sunlight, in contact with fluids, or where there is excessive dust or humidity.
 - Be sure the air vents on the UPS are not blocked. Allow adequate space for proper ventilation. Keep rear panel 300mm from wall or any obstructions.
 - The battery typically lasts for two to five years. Environmental factors impact battery life. Elevated ambient temperatures, poor quality utility power, and frequent short duration discharges will shorten battery life.
 - Before installing or servicing the equipment check that the Disconnecting from the AC mains and load. The UPS contains internal batteries and may present a shock hazard even when disconnected from the branch circuit (mains).
 - Doing wiring, maintenance service and batteries replacement should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
 - When replacing batteries, replace with the same type and number of batteries or battery packs.
 - CAUTION: Do not dispose of batteries by burning them. The batteries may explode.
 - CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes, and may be toxic.
 - CAUTION: A battery can present a risk of electrical shock and high short-circuit current through conductive materials could cause severe burns.
- The following precautions should be observed when working on batteries:
 Before installing or replacing the batteries, remove jewelry such as wristwatches and rings, or other metal objects.
 When working on batteries should wear rubber gloves and boots. Also, must use tools with insulated handles, and do not lay tools or metal parts on top of batteries.
 Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

● Symbols

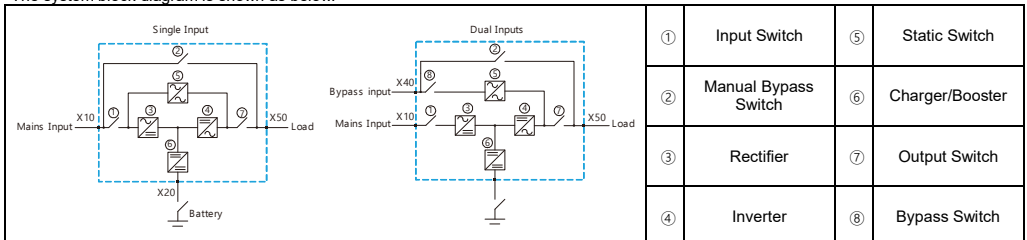
Please follow the instructions and warnings on the UPS.

	WARNING ! Refer to the operating instructions.
	WARNING ! High voltage inside.
GROUND	Ground

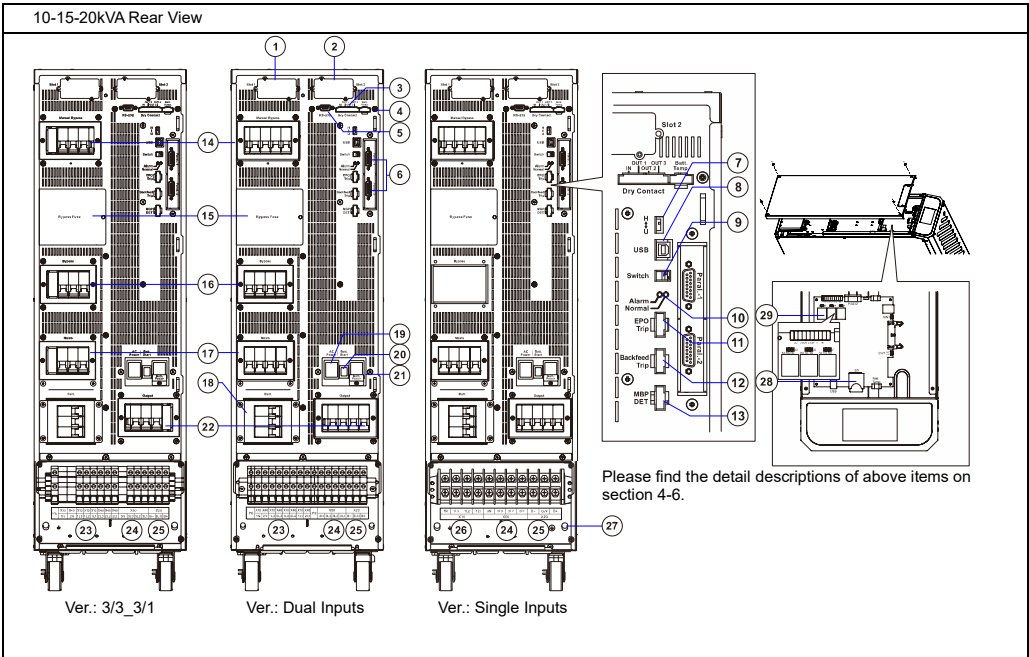
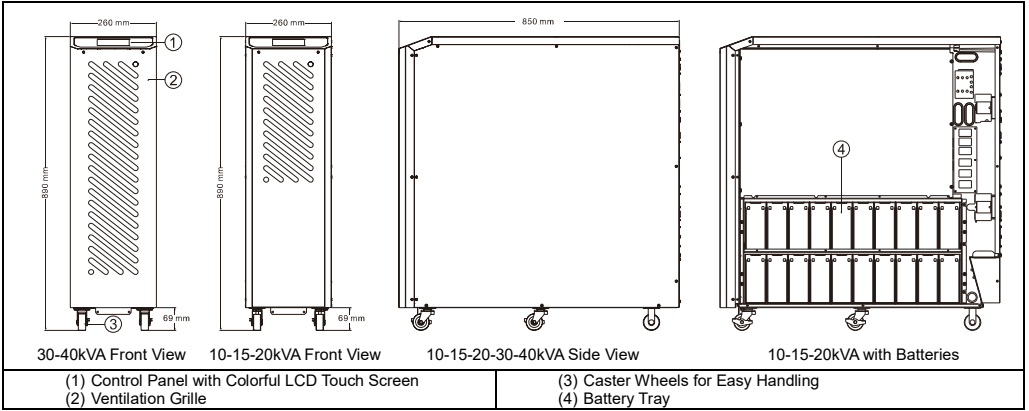
3. Function Description

3.1 UPS Block Diagram

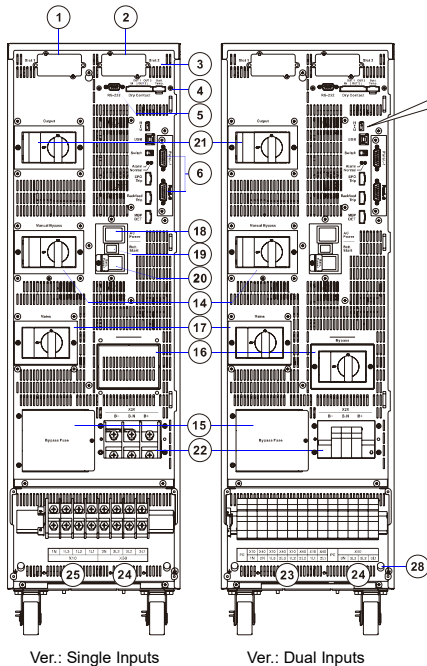
The system block diagram is shown as below.



3.2 UPS Outlook View



- | | |
|--|--|
| <ul style="list-style-type: none"> (1) Communication Slot 1 (2) Communication Slot 2 (3) Dry Contacts (4) External Battery Temperature Connector (5) RS-232 Port for Setting Software (6) Parallel Communication Ports (Option) (7) Communication Selector for Service Only (8) USB Port for Service Only (9) Terminal Resistor Setting Switch for Parallel Communication (10) Status LED Indicators (11) EPO (12) Backfeed Trip Contact (13) MBP Detector (14) Manual Bypass Breaker (15) Bypass Fuse (Option) | <ul style="list-style-type: none"> (16) Bypass Input Breaker (17) Mains Input Breaker (18) Battery Breaker (19) AC Working Power (20) Batt. Start (21) Batt. Working Power (22) Output Breaker (23) X10/X40: Mains/Bypass Input Connections Terminal (1N, 2N, 1L3, 2L3, 1L2, 2L2, 1L1, 2L1) (24) X50: Output Connection Terminals (3N, 3L3, 3L2, 3L1) (25) X20: External Battery Connection Terminals (B-, B_N, B+) (26) X10: Mains Input Connection Terminals (1N, 1L3, 1L2, 1L1) (27) Ground Connection (28) SD Card Slot (29) Jumpers (J1~J3) for each output contact |
|--|--|



- (1) Communication Slot 1
- (2) Communication Slot 2
- (3) Dry Contacts
- (4) External Battery Temperature Connector
- (5) RS-232 Port for Setting Software
- (6) Parallel Communication Ports (Option)
- (7) Communication Selector for Service Only
- (8) USB Port for Service Only
- (9) Terminal Resistor Setting Switch for Parallel Communication
- (10) Status LED Indicators
- (11) EPO
- (12) Backfeed Trip Contact
- (13) MBP Detector
- (14) Manual Bypass Switch
- (15) Bypass Fuse (Option)
- (16) Bypass Input Switch
- (17) Mains Input Switch
- (18) AC Working Power
- (19) Batt. Start
- (20) Batt. Working Power
- (21) Output Switch
- (22) X20: External Battery Connection Terminals (B-, B_N, B+)
- (23) X10/X40: Mains/Bypass Input Connections Terminal (1N, 2N, 1L3, 2L3, 1L2, 2L2, 1L1, 2L1)
- (24) X50: Output Connection Terminals (3N, 3L3, 3L2, 3L1)
- (25) X10: Mains Input Connection Terminals (1N, 1L3, 1L2, 1L1)
- (26) SD Card Slot
- (27) Jumpers (J1~J3) for each output contact
- (28) Ground Connection

Please find the detail descriptions of above items on section 4-6.

4. Installation and Wiring

4.1 Storage and Installation Environment

4.1.1 Storage Environment

- ◆ Temperature -20°C ~ 70°C
- ◆ Relative Humidity ≤ 95%

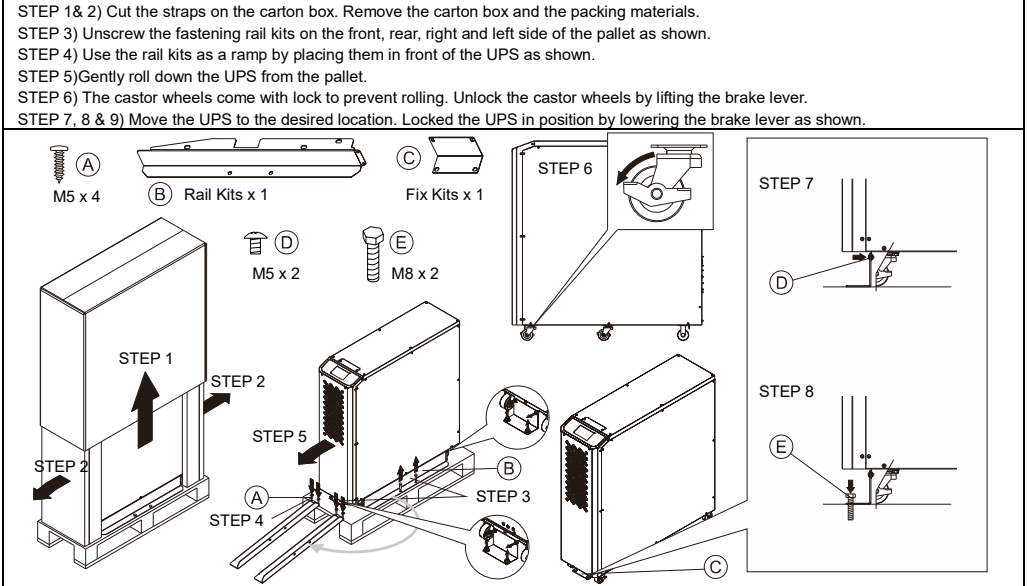
4.1.2 Installation Environment

- The installation location of the UPS should be well-ventilated with ambient temperature ranging from 0°C ~ 40°C, preferably air-conditioned with temperature within 20°C ~ 25°C for optimum battery life as recommended by battery manufacturers.
- Recommended Relative Humidity ≤ 95% (without condensation)
- At ≤ Altitude 1000m the UPS is able to provide nominal power without derating. The UPS maximum output current must be derated by 1% for every additional 100m above 1,000m.
- This product must not be used in hazardous environment.
- This UPS is not suitable for outdoors use.
- Rodents may be attracted to the heat generated by the UPS, do take precautions to prevent rodents from entering the UPS and chewing on electrical wiring.
- The UPS and Battery are heavy, always place them on structurally stable location with sufficient floor-loading.

4.2 Unpacking, Removing and Fixing UPS

Inspect the UPS upon receipt. The packaging is robust, but accidents and damage may still occur during shipment. Notify the forwarder and dealer if there is damage.

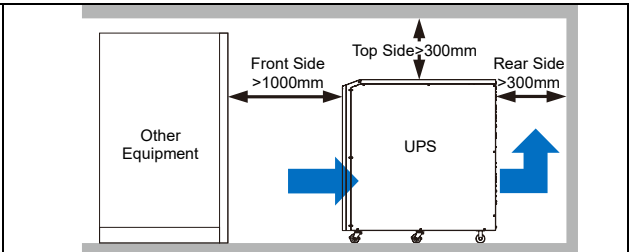
This section describes the unpacking and removing processes for wheel type.



4.3 General Requirement for Ventilation and Maintenance (does not apply when fitting inside a ResiPOWER Sprinkler Proof Enclosure)

During installation ensure that the following conditions are met.

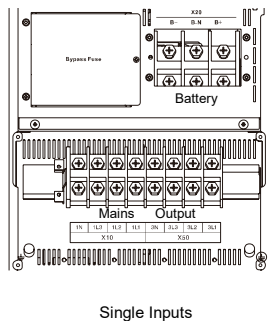
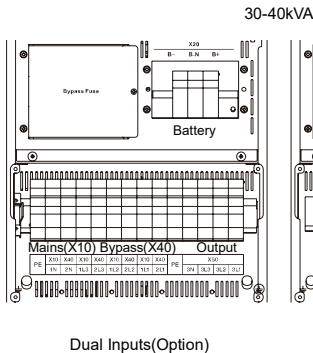
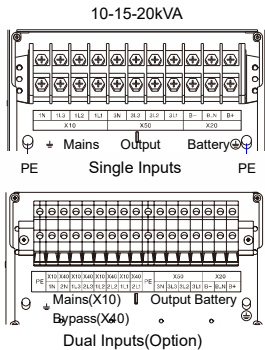
- Keep at least 1000 mm of front clearance for air flow and future maintenance purposes.
- Keep at least 300mm of topside and rear clearance away from walls or any obstruction.
- Ensure that the installation site is free from excessive dust and the ambient temperature and humidity are within the specified limits.
- Do not place the UPS in a dusty or corrosive environment or near any flammable objects.
- This UPS is not designed for outdoor use.



4.4 Power Cables Connections

4.4.1 Power Connection Positions

The drawing below shows the positions of power terminals.

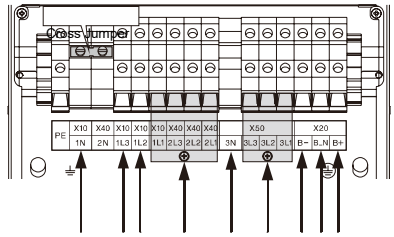


4.4.2 3:1 UPS Power Cables Connection

The drawing below shows the cables connections specifically for 3:1 UPS (3 phase input and 1 phase output) only.

Only specific 10kVA & 20kVA UPS model are allows converting from 3: 3 to 3:1 UPS.

Please contact your local agent if in doubt.



4.4.3 Maximum Current

Input / Output Voltage	Output Power	Mains Input Output Battery				
		Maximum Input Current ⁽¹⁾		Max. Output/Bypass Input Current ⁽²⁾		Max. Battery Discharge Current ⁽³⁾
		PF 1.0	PF 0.9	Three Phase Output	Single Phase Output	
380 V	10KVA	19.2 A	17.4 A	15.2 A	45.6 A	35 A
	15KVA	28.8 A	25.6 A	22.8 A	68.4 A	52 A
	20KVA	38.4 A	34.4 A	30.4 A	91.2 A	69 A
	30KVA	56.6 A	50.9 A	45.6 A	N/A	103 A
	40KVA	75.2 A	67.7 A	60.8 A	N/A	137 A
400 V	10KVA	18.2 A	16.5 A	14.4 A	43.3 A	35 A
	15KVA	27.2 A	24.3 A	21.7 A	65.0 A	52 A
	20KVA	36.3 A	32.7 A	28.9 A	86.6 A	69 A
	30KVA	53.8 A	48.4 A	43.3 A	N/A	103 A
	40KVA	71.4 A	64.3 A	57.7 A	N/A	137 A
415 V	10KVA	17.5 A	15.9 A	13.9 A	41.7 A	35 A
	15KVA	26.3 A	23.5 A	20.9 A	62.6 A	52 A
	20KVA	35.0 A	31.5 A	27.8 A	83.5 A	69 A
	30KVA	51.8 A	46.6 A	41.7 A	N/A	103 A
	40KVA	68.9 A	62.0 A	55.6 A	N/A	137 A

(1)The UPS is operating at rated voltage, rated power and batteries are charging normally.

(2)The UPS is operating at rated voltage and rated power.

(3)12V/battery blocks × 32pcs. The UPS is operating at rated voltage and rated power PF1.0.

4.4.4 Minimum Recommended Cable Size

Capacity	Mains Input ⁽¹⁾	Output/Bypass Input ⁽¹⁾		External Battery ⁽¹⁾
	R/S/T/N/PE	Three Phase Output R/S/T/N/PE ⁽²⁾	Single Phase Output R/N/PE	B+/N/B-/PE
10KVA	4 mm ²	4 mm ²	16 mm ²	10 mm ²
15KVA	6 mm ²	6 mm ²	25 mm ²	16mm ²
20KVA	10mm ²	6 mm ²	35 mm ²	16mm ²
30KVA	16 mm ²	16 mm ²	N/A	35 mm ²
40KVA	25 mm ²	25 mm ²	N/A	50 mm ²

(1)The recommended maximum cable length is 10meters or less.

(2)Please oversized the Neutral line N by 1.7 times of the phase line for non-linear loads.

4.4.5 Minimum Recommended Circuit Breaker Size

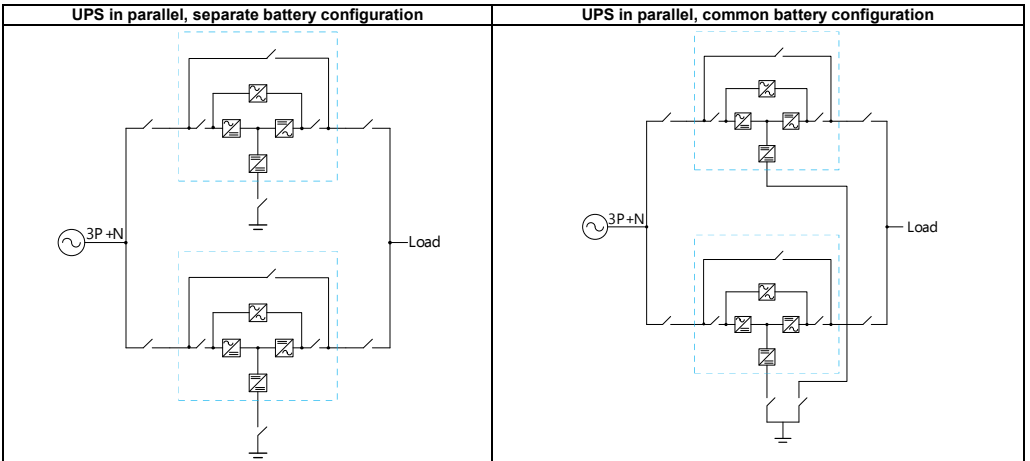
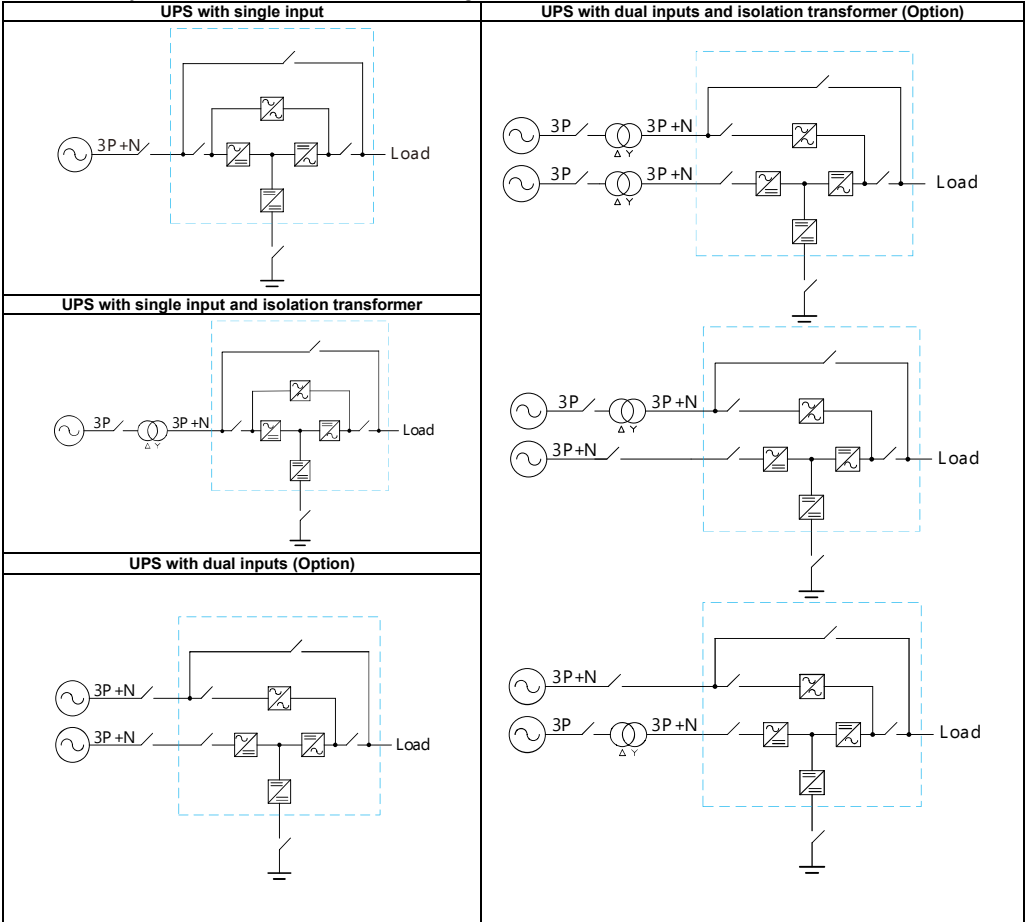
Input / Output Voltage	Output Power	Mains Input	Output/Bypass Input	
			Three Phase Output	Single Phase Output
380 V	10KVA	20 A	20 A	50 A
	15KVA	32 A	25 A	80 A
	20KVA	40 A	40 A	100A
	30KVA	63 A	50 A	N/A
	40KVA	80 A	80 A	N/A
400 V	10KVA	20 A	16 A	50 A
	15KVA	32A	25 A	80 A
	20KVA	40 A	32 A	100A
	30KVA	63 A	50 A	N/A
	40KVA	80 A	80 A	N/A
415 V	10KVA	20 A	16 A	50 A
	15KVA	32A	25A	80 A
	20KVA	40 A	32 A	100A
	30KVA	63 A	50 A	N/A
	40KVA	80 A	80 A	N/A

(1)Tripping curve C breaker is recommended.

(2)The sizing takes into account 150% overload capacity.

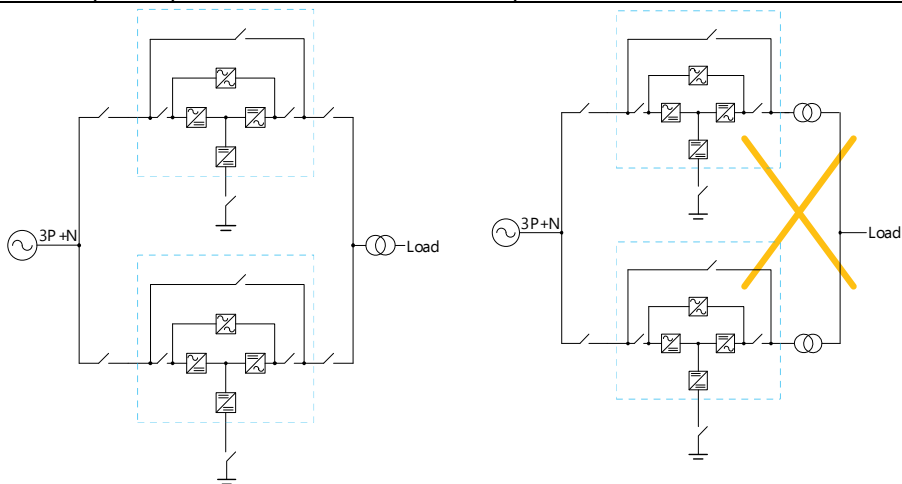
(3)Please consider curve D breaker for motor loads with high starting currents.

4.4.6 Electrical System Connections with various UPS configurations



UPS in parallel with output transformer

Please do not use separate output transformer for each UPS. A common output transformer is recommended.



4.5 Auxiliary Power Supply Control Switch and Button

● AC Power

This is auxiliary power switch for the working power.

Please ensure this power switch is On before turning on the UPS. Do not turn this switch off when UPS is working.

● Batt. Start

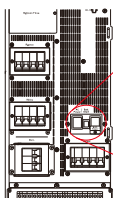
User can start-up UPS by battery when main input power is not available.

Please ensure the Batt. Power switch is turn On before pressing this button. Please find the detail descriptions of above items on section 5.4.2.

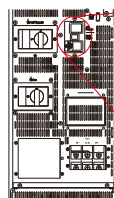
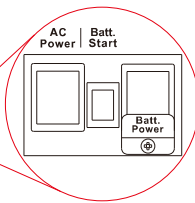
● Batt. Power

This is only for Batt. Start

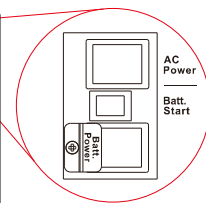
Please find the detail descriptions of above items on section 5.4.2.



10-15-20k VA



30-40k VA



4.6 Communication Cables Connections

● Dry Contacts

The UPS provides 3 output dry contacts and 1 input contact.

Specification of Output dry contact : 250 VAC/ 2

A; 30 VDC/2 A

There are 3 jumpers (J1~J3) to set NC/NO for each output contact.

To short the input contact for sending a command to UPS.

The user can change the definition for each contact, please contact the local authorized service agent to change the setting.

Jumper (J1~J3) are displayed in Internal Top View (Please check section 3.2. UPS Outlook View).

● Communication Slot1

This slot can install Relay card or RS-485 MODBUS card.

● Communication Slot2

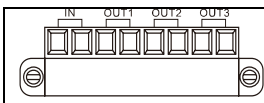
This slot can install Relay card or SNMP card. Please ensure the SW2 switch to correct position when this slot is used.

● Batt. Temp.--External battery temperature connector

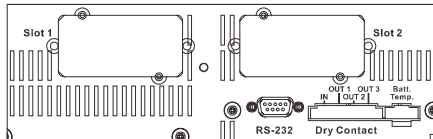
Connect to external battery temperature sensor. Please refer to section 7.2.

● RS-232

Pin Assignment:



Default Definition	
General alarm	OUT-1
Load on inverter	OUT-2
Load on Bypass	OUT-3
Normal mode	IN



	2→TX (OUT)	Baud Rate	57600bps
	3→RX (IN)	Data Length	8 bits
	5→Ground	Stop Bit	1 bit
		Parity	None

This port is available for change the setting of UPS by setting software.

● **Paral-1&Paral-2—parallel communication port**

Parallel communication cables are required to connect UPS each other when UPSs operation in parallel. Please refer to section 4.7for detail connections.

● **H→U—communication selector**

This switch is to select HMI or USB port. Please ensure this switch on "H" position for ensure HMI port is workable.

● **USB**

This port is for service only.

● **Switch—the switch for terminal resistor of parallel communication**

To ensure good parallel communication quality, please set the switch of the two farthest UPS to the "ON" position. Please refer to section 4.7 for detail.

● **LED Status Indicators**

Normal:The UPS is normal.

Alarm:The UPS has some abnormal conditions.

● **EPO-- Emergence Power Off**

This EPO contact allows you to turn off the UPS in case of emergency. Short this contact to turn off the UPS immediately.

● **Backfeed Trip**

The UPS provide a backfeed protection contact to trip the external electromechanical device for isolation from the power circuit. The backfeed protection is for ensuring personnel safety against any risk of accidental energy return to the input circuit. It imposes the automatic opening of a switching device in case of a malfunction of the static switch.

● **MBP Det.**

In case of external manual bypass switch has been installed with UPS system, this detector should be connected to auxiliary of external manual bypass switch.

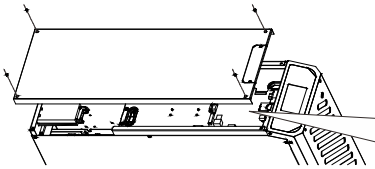
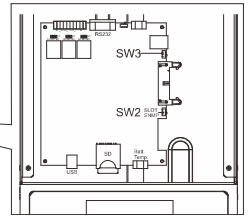
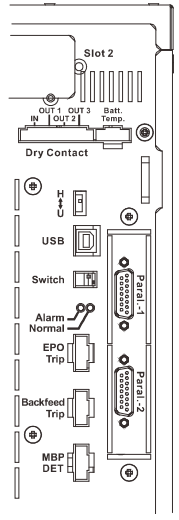
● **SW2**

When Relay card is installed in Slot2, please switch to "Slot" position.

When SNMP card is installed in Slot2, please switch to "SNMP" position.

● **SW3—the switch for terminal resistor of parallel communication**

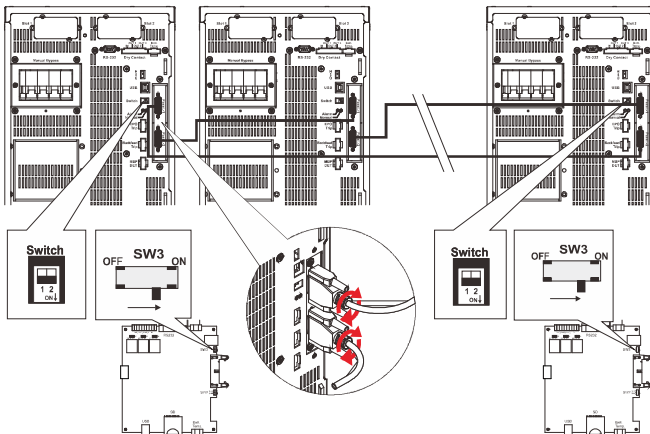
To ensure good parallel communication quality, please set the switch of the two farthest UPS to the "ON" position. Please refer to section 4.7 for detail.



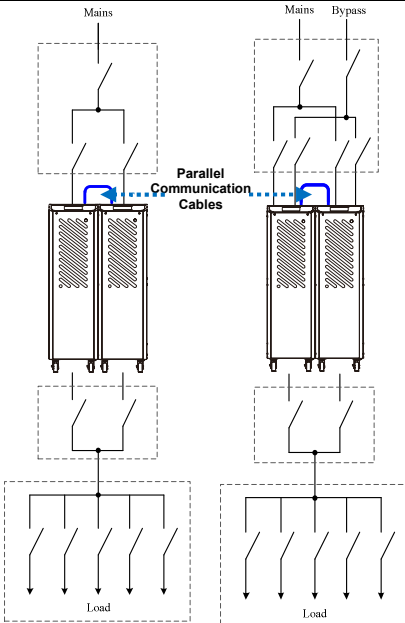
4.7 UPS Parallel Connections (Option)

The UPS can be operated in parallel for extend the capacity and enhances system reliability.

- Up to 6 UPS units can be operated in parallel.
- To make sure each UPS is equipped with parallel card (Option).
- The size and length of the input and output cables must be identical for all UPS units.
- The phase rotation must be the same for each UPS unit.
- It is recommended to use an external bypass cabinet to facilitate maintenance and system testing for parallel operation system.
- Parallel configuration must be performed by authorized and qualified technicians who are familiar with this UPS.
- Parallel communication cables are requested to connect to UPS each other.
- Please only use the parallel communication cables which are supplied with UPS manufacturer for ensure UPS can operate correctly in a parallel configuration.
- The parallel communication cables must be connected in a ring topology, and the maximum total length of the parallel communication cables must be less than 38 meters. To ensure good communication quality you must set the Switch & SW3 of the two farthest UPS to the "ON" position as shown in below. (Please reference to section 4.6 for SW3)
- When UPS operation in Parallel, please plug into parallel communication cables, as shown below.



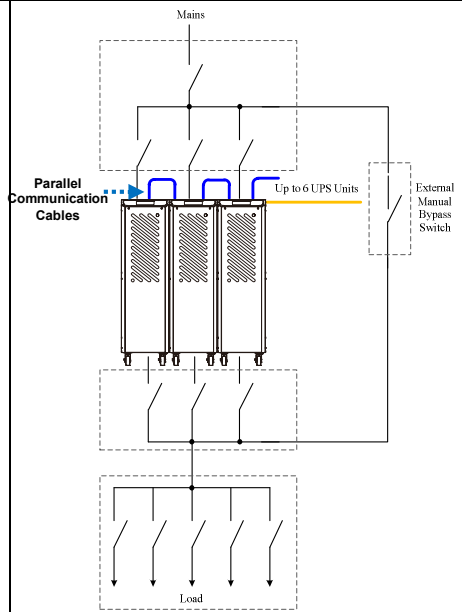
Recommended 1+1 parallel system configuration



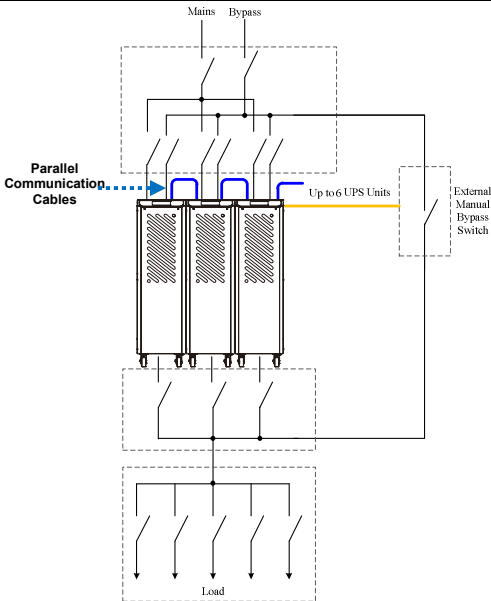
1+1 parallel, Single Input

1+1 parallel, Dual Inputs (Option)

Recommended N+1 parallel for single input system configuration



Recommended N+1 parallel for dual inputs system configuration



5. Operation Descriptions

5.1 Operating Mode

The UPS provides the following operating modes:

- **Normal Mode(Online Mode)**

In Normal mode, grid power is passed through Rectifier then used to charge the battery and provide power through the Inverter simultaneously. Different output voltages settings can be set in VFI mode. The three options are 380/220V, 400/230V and 415/240V. These can be fine-tuned by $\pm 8V$.

- **Economy Mode (ECO)**

Economy Mode effectively improves overall efficiency. In ECO Mode grid power is routed through the Static Switch to the load. At the same time, grid power continues to charge the battery in DC/DC mode through Rectifier following the same setup as VFI Mode. Inverter is also kept ready to supply power supply modes at any time. If VFI mode is set then power can be quickly routed from Bypass to Inverter.

Attention: In ECO Mode, the power supply frequency and voltage will be less stable. Please check the load requirements and use ECO Mode with care.

- **Converter Mode**

Converter Mode allows the user to provide a power supply with constant voltage and constant frequency based on their power requirements. The frequency can be set to 50HZ or 60HZ. The voltage options are 380/220V, 400/230V and 415/240V. These can be fine-tuned by $\pm 8V$. When Converter mode is used, in the event of grid power failure then power is provided from the battery in Back-up mode. In the event of the battery running low, UPS overload, Inverter failure or module overheating, the entire system will shut down.

5.2 Online Operations

An online UPS provides stable power that is not affected by an unstable main power supply (ex. grid power). Through the online UPS, grid power can provide a clean, noise-free power supply environment.

The online architecture offers three types of power supply methods depending on the power environment.

- **Normal Mode**

When grid power is normal, once Rectifier has been turned on at the main power supply then the battery is charged in DC/DC mode while the required power is supplied via Inverter at the same time.

- **Bypass Mode**

In the event of UPS overload, Inverter failure or module overheating, the power supply circuit switches from Inverter to the bypass output.

- **Battery Mode**

When the UPS detects a failure in the main power supply then power is provided from the battery instead. The touch screen at the front of the module will also display current battery level to remind the user.

5.3 Manual Bypass Operation

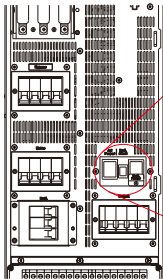
When the manual bypass switch is activated, the load is powered directly from the bypass input. This operation is useful when maintenance needs to be carried out on UPS since service personnel can work on the installation without having to cut off the power to the load.

Attention:

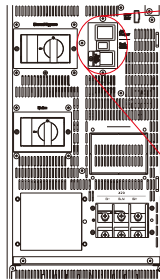
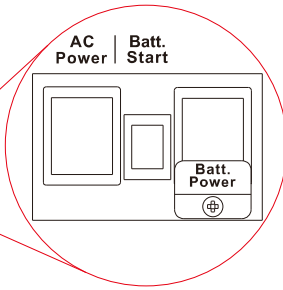
UPS maintenance can only be performed by authorized and qualified technicians who are familiar with this UPS.

If the UPS is in battery mode, turn on the manual bypass switch may cut off power to the load.

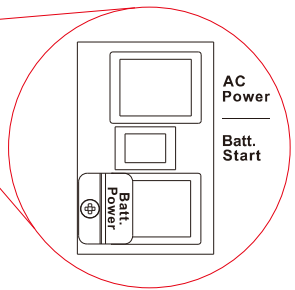
5.4 Operation Processes



10-15-20k VA



30-40k VA



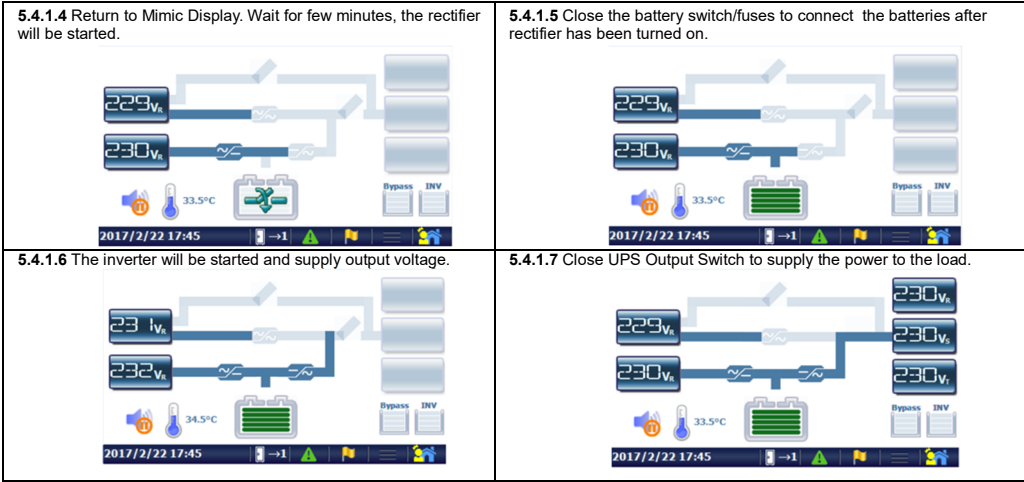
5.4.1 Normal Mode Start-up

5.4.1.1 In the rear of UPS, switch ON the AC Power switch.


5.4.1.2 Close UPS Mains Input and Bypass Input Switches if equipped.




5.4.1.3 Select → Command → Operation → NormalMode on LCD display.



5.4.2 Cold Start

- 5.4.2.1 User can start-up UPS by battery when main input power is not available.
- 5.4.2.2 If the UPS with external batteries configuration, it must to make sure the batteries are connected.
- 5.4.2.3 Switch ON the **Batt. Power** switch in the rear of UPS.
- 5.4.2.4 In the rear of UPS, push button and hold down the button that indicated "**Batt. Start**" for 7 seconds at least.
- 5.4.2.5 Select  → **Command** → **Operation** → **ColdStartPrechargeReady** on LCD display.
- 5.4.2.6 Select **Normal Mode** to start UPS.
- 5.4.2.7 Once UPS working in Normal Mode, switch OFF the **Batt. Power** switch in the rear of UPS.


5.4.3 Shutdown

- 5.4.3.1 Select  → **Command** → **Operation** → **Shutdown** on LCD display.



Attention:

- **IMMEDIATE LOAD OFF!**
- **For turn off the working power, switch OFF both AC Power and Batt. Power switches in the rear of UPS.**



5.4.4 Switch to bypass

- 5.4.4.1 Select  → **Command** → **Operation** → **LoadonBypass** on LCD display.
- 5.4.4.2 The Inverter will be shutdown and bypass will supply the power to the load. If the battery is disconnected, Rectifier and Charger will be shutdown as well.

5.4.5 Switch from normal mode to maintenance bypass

- 5.4.5.1 Select  → **Command** → **Operation** → **LoadonBypass** on LCD display.
- 5.4.5.2 The Inverter will be shutdown and bypass will supply the power to the load.
- 5.4.5.3 Open/disconnected the external battery Switch/fuses if equipped.
- 5.4.5.4 Close the maintenance bypass switch.
- 5.4.5.5 Select  → **Command** → **Operation** → **Shutdown** on LCD display.
- 5.4.5.6 Open Output and Mains/Bypass Input switch.
- 5.4.5.7 In the rear of UPS, switch OFF **AC Power** and **Batt. Power** switches.

5.4.6 Maintenance bypass → normal mode

- 5.4.6.1 In the rear of UPS, switch ON **AC Power** switch for start working Power.
- 5.4.6.2 Close Output and Mains /Bypass Input switch.
- 5.4.6.3 Select  → **Command** → **Operation** → **LoadonBypass** on LCD display.
- 5.4.6.4 Open maintenance bypass switch.
- 5.4.6.5 Select  → **Command** → **Operation** → **NormalMode** on LCD display.

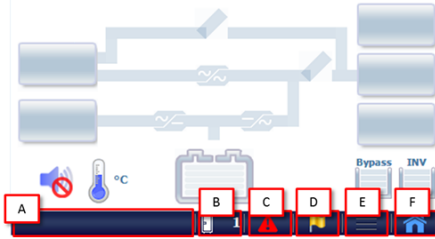


Return to **Mimic Display**. Wait for few minutes, the rectifier will be start and the icon will show you when can close the Battery line switch/fuses to connect the batteries.

6. Control Panel Operation and Function Description

Each UPS is equipped with a LCD touch panel to provide the user with a simple and intuitive user interface that is easy to learn. Please refer to below section for learn more detail information and functions of the LCD touch panel.

6.1 Screen Introduction



[A] Display current time, status and information of UPS.

[B] Indicate Single or Parallel system, and select the desire UPS unit to check the information.



Single Unit

Parallel System

[C] Click here to see the alarm message.



The green pattern indicates that UPS is normal.

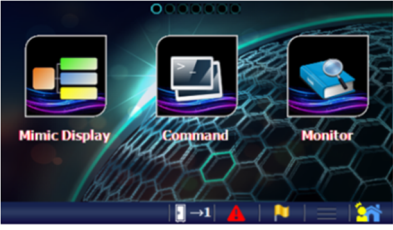
The red pattern indicates that UPS abnormal conditions occurred.


[D] Click here to see the status.

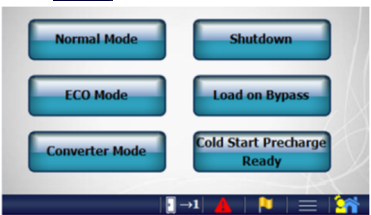
[E] Enter to Sub-Menu, please refer to section 6.2 for more detail.


[F] Enter to Menu, please refer to section 6.2 for more detail.


6.2 Menu






Click  to hide/show the sub-menu.



Click  to enter to Menu screen as shown in above picture. Slide the screen to switch to other menu page and click the menu icon to enter to the desire function.



The button below will appear on some function pages.

Button	Function
	Click it to save the new setting
	Click it to reload the data
	Click it to go to Mimic Display

• All menu functions are showing as below table.

Menu	Sub-Menu	Functions
Mimic Display		Display the UPS status · alarm · operating mode and measurements. Please refer to section 6.3 for more detail.
Command ⁽¹⁾	Operation	◆ Normal Mode ◆ ECO Mode ◆ Converter Mode ◆ Shutdown ◆ Load on Bypass ◆ Cold Start Precharge Ready
	Buzzer & Alarm	Enable/Disable buzzer Clear Latch Alarm and Buzzer

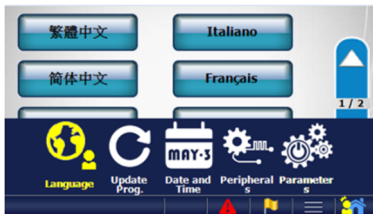
Command⁽¹⁾	Other	Force Charger on Recovery Backfeed Protection Signal Clear UPS Maintenance Alarm
	Battery Test	Battery Test. Turn off The Battery Test.
Monitor	Identification	Display UPS information
	Real Time Information	Display real time measurements of input, output, bypass and battery.
	Maintenance Code	Display the maintenance code for technician to check the status of the UPS.
	Version	Display the control MCU software and firmware version.
Configuration	Alarm	Set alarm latch function. ◆General Alarm◆MainsAlarm◆BypassAlarm◆Over Temperature ◆Vbatt. Low◆InverterOverload◆BypassOverload◆EPO Activated
	Main	Select the measurements on Mimic Display.
	Bypass	
	Output	
Management	Schedule	Display the schedule.
	Schedule Setting ⁽¹⁾	To define the schedule for ECO mode.
	Battery Test Schedule ⁽¹⁾	To define the schedule for battery test.
Setting	Language	Select the display language
	Update Prog.	Upgrade the software of LCD touch display.
	Date and Time	Set date and time.
	Peripherals ⁽¹⁾	Set communication card.
	Parameters ⁽¹⁾	UPS parameters which can be modified.
Event Log		Display the event log list of UPS.
Permission Setting	Login/Logout	Login with the password ⁽²⁾

(1)This function menu only appears after login; please refer to "Permission Setting".

(2)Default password is "3366".

● Enter in the Parameters Page

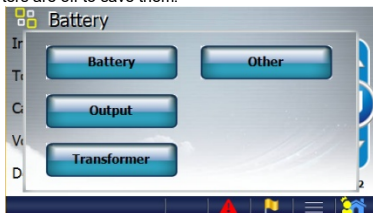
From the menu enter in the Setting Icon then click Parameters.



Use the login password then press enter.



Now you are able to modify the UPS parameters be sure that the converters are off to save them.



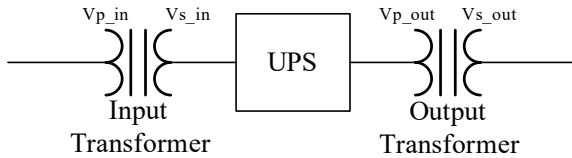
● UPS parameters which can be modified by the user from the control panel are listed in the table below.

Parameters	Content	Range	Default
Battery	Independent/Common	Ind. / Common	Common
	Total cell number	192 ~ 240 ⁽¹⁾	240
	Capacity	1~1000	18
	Voltage Temperature compensation	Yes / No	No
	Detect the Battery connecting	Yes / No	Yes
	Charger current	0.0~1.0	0.1
	CV Charger voltage [V/cell]	2.000~2.550	2.300

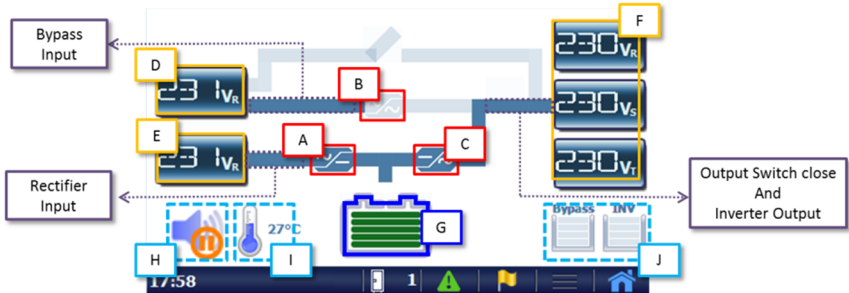
Battery	FV Charger voltage [V/cell]	2.000~2.550	2.250
	Vbatt. Low [V/cell]	1.850 ~ 1.900	1.850
	Vbatt. Min [V/cell]	1.600 ~ 1.850	1.670
	Battery test 2 minutes	Yes / No	Yes
Output	Output voltage	220 · 230 · 240	230
	Output frequency	50 · 60	50
	Fine adjustment voltage	-8 ~ 8	0
Transformer	Input transformer	No / Mains & Bypass	No
	Input transformer ratio ⁽²⁾	0.00~10.00	0
	Output transformer	No / Yes	No
	Output transformer ratio ⁽²⁾	0.00~10.00	0
Other	Unit number	1 ~ 6	1
	Number of units in parallel system	1 ~ 6	1
	Set EPO logic	NO/NC	NO

(1)The Range setting for 10kVA is 156 ~ 240 and 15-40kVA is 192 ~ 240.

(2)Transformer ratios can be calculated as following, Input transformer ratio = V_{p_in}/V_{s_in} ; Output transformer ratio = V_{p_out}/V_{s_out}



6.3 Mimic Display



【A】 is Rectifier · 【B】 is Static Switch and 【C】 is Inverter.

The red pattern indicates this part isn't activated.

The blue pattern indicates this part is activated.

The red pattern indicates this part is occurred abnormal condition.

【D】 Display the bypass input measurements.

【E】 Display the mains input measurements.

【F】 Display the output measurements.

The abnormal measurements will have red background

Click 【D】 【E】 【F】 to change the measure parameter and press for 3 seconds to enter to Real Time Information.

【G】 Display the status of battery.

Press it for 3 second to enter to Real Time Information.

The battery isn't connected.

The green pattern indicates the battery is charging.

The yellow pattern indicates the battery is discharging.

【H】 Alarm silence button. Click it to silence the alarm and press for 3 seconds to enable/disable the buzzer.

Buzzer is enabled and Buzzer is disabled.

【I】 Display UPS internal temperature.

Press for 3 seconds to enter to Real Time Information.

【J】 Overload counter

7. Options

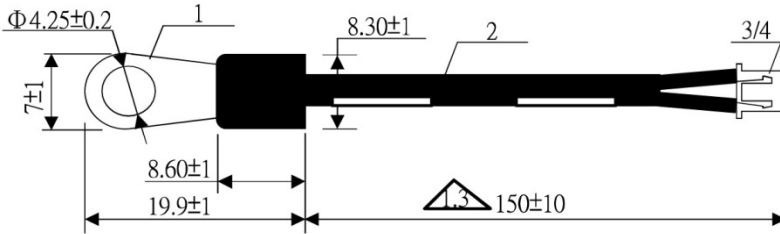
7.1 Hardware Setup

1. Connect to either RS-232 communication or USB communication.

2. Connect a male RS-232 connector or a USB cable* to the UPS communication port. Connect the female RS-232 connector or the other end of the USB cable to the computer.

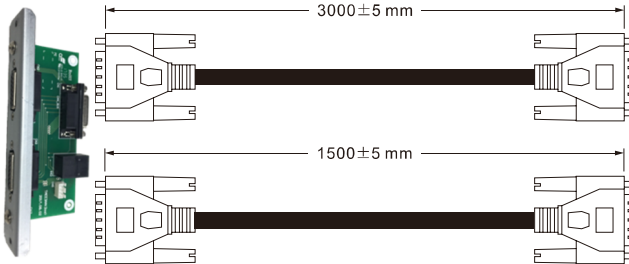
*Note: RS-232 and USB cables are optional.

7.2 Temperature Sensor





Measure the battery temperature.

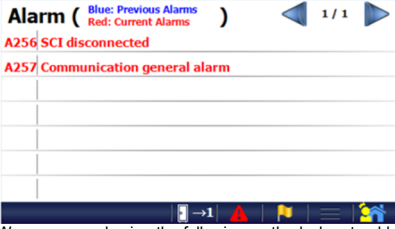
7.3 Parallel Communication Card



The parallel communication cards are required when UPS in parallel and it comes with 1.5 meters parallel communication cable. A longer parallel communication cable is available for more UPS in parallel.

8. Troubleshooting

In the event of failure, the display area on the control panel will highlight the problem area in red. The "Alarm" symbol  will also blink to warn that there is a problem with the UPS. Click  to have an alarm list as below picture.

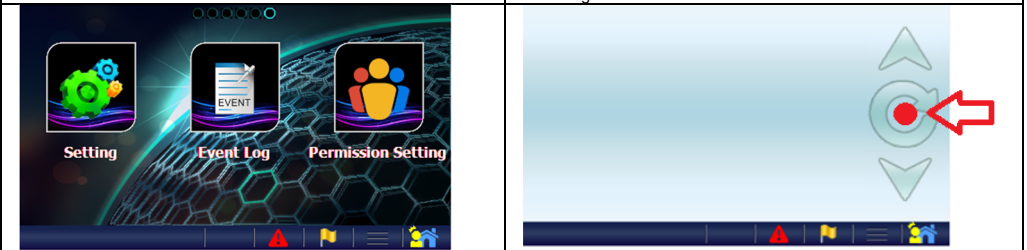


We recommend using the following method when troubleshooting to export **the event log and machine information** from LCD panel to the SD card.

1. Make sure the SD card has been inserted on LCD panel.

2. On LCD, select  → **Event Log**.

3. Before export, you need to refresh the log on LCD. Touch here for refreshing.

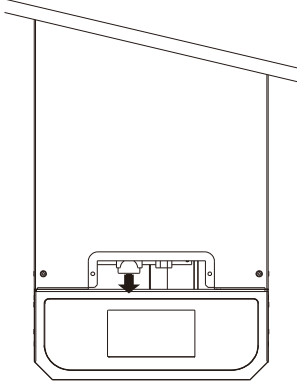
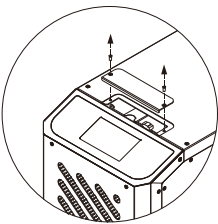


4. After all log has been showed on LCD, touch again for 2 seconds.

5. LCD will show " Export ? ". Then select " Enter ".

6. The event log and machine information will be saved on SD card named

xxxx_KN_xx_IDx_XXXXXX_Log.txt and xxxx_KN_xx_IDx_XXXXXX_Inf.mch, please send it to your technical support.



9. Technical Specification

Capacity		3:1 10 kVA	3:1 15kVA	3:1 20 kVA	3:3 10 kVA	3:3 15kVA	3:3 20 kVA	3:3 30 kVA	3:3 40 kVA
Input									
Voltage		400V 3 Phase + N							
Voltage Tolerance		±20% @100% load, -40% @50% load -20%~-40% Output capacity decrease linearly according to the input voltage							
Frequency		40 ~ 70Hz							
Power Factor		≥ 0.99							
THDi		≤5%@100% load				≤3%@100% load			
Output									
Voltage		220/230/240V 1 Phase + N				380/400/415V 3 Phase + N			
Voltage Tolerance		±1% (Static Load)							
Frequency		50/60Hz							
Frequency Tolerance		±0.01% (free running)							
Power Factor		0.9				1.0			
Crest Factor		3:1							
Voltage Harmonic Distortion		≤2% with linear load; ≤5% with distorting load							
Overload		110% for 60 minutes, 125% for 10 minutes, 150% for 1minutes (<105% overload continuously without alarm, >= 105% <110% continuously with alarm)							
Bypass									
Voltage		220/230/240V 1 Phase + N				380/400/415V 3 Phase + N			
Voltage Tolerance		Preventive range ±10% (Adjustable ±5% ~ ±15%) Critical range ±25% (Adjustable ±16% ~ ±30%)							
Frequency		50/60Hz							
Frequency Tolerance		±1Hz / ±3Hz (Selectable)							
Battery									
Number of batteries (Configurable)		12V, 32/34/36/38/40pcs ⁽¹⁾			12V, 26/28/30/32 /34/36/38/4 0pcs	12V, 32 ⁽²⁾ /34/36/38/40pcs			
Charging Current	100% Load	3.5A	5.0A	7.0A	3.5A	5.0A	7.0A	10A	13A
	Max. ⁽³⁾ <60% Load	10A	15A	21A	10A	15A	21A	30A	39A
Common Battery for Parallel Configuration		Yes							
Internal Battery		Available for housing 12V 7/9Ah 40pcs							N.A.
Maximum Efficiency									
VFI Mode		>92.5%	>93.5%	>93.5%	>94%	>94.5%	>94.5%	>95%	>95.5%
ECO Mode		>98%							
Backup		>91%	>92%	>92%	>93%	>93.5%	>93.5%	>94%	>94.5%
HMI & Communication									
Display and MMI		4.3" Colorful LCD Touch Screen							
Built-in CommunicationPort		RS-232, EPO, Dry Contacts							
Optional Communication		2 Communication Slots for SNMP Card, RS-485 MODBUS Card, Dry Contact Card							
Mechanical Characteristic									
Dimensions (W x D x H) mm		260 x 850 x 890							
Weight (w/o battery)		74 kg	76 kg	76 kg	74 kg	76 kg	76 kg	85 kg	88 kg
Protection Grade		IP20							
Color		RAL 9005							
Environment									
Storage Temperature		-20℃ ~ 70℃							
Storage Humidity		≤ 95%							
Operation Temperature		0 ~ 40℃							
Operation Humidity		0 ~ 95% (w/o condensation)							
Operating Altitude		<1000 m without derating ⁽⁴⁾							
Tested to standards		LVD: EN62040-1, EMC requirements: EN62040-2							
Mark		CE							
Noise (at 1 meter)		<52dBA							<55dBA

⁽¹⁾20kVA 3/1 model available with 32/34/36/38pcs if load is less than 80%.

⁽²⁾15-40kVA with 32pcs batteries less than 30min. backup time.

⁽³⁾To increase the charging current please refer to your sales contact.

⁽⁴⁾Over 1000m above sea level, the maximum output capacity must be derated by 1% every additional 100m.

