



3/3 Battery-Integrated UPS

within up to 12 internal 10pcs 7/9Ah battery packs

HVD33 S Series

(10-40kVA)

User Manual



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1. Safety

Important safety instructions - Save these instructions

There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.

1.1 Safety notes

1. Even no connection with utility power, 220/230/240VAC voltage may still exist at UPS terminal!
2. For the sake of human being safety, please well earth the UPS before starting it.
3. If battery cables or power cables need to be replaced, please purchase the original components to avoid overheating, sparking, or fire risks caused by insufficient current-carrying capacity.
4. Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body!
5. Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire!
6. Don't disassemble the UPS cover, or there may be an electric shock!
7. Check if there exists high voltage before touching the battery
8. Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid the UPS from working under following environment for long time
 - ◆Area where the humidity and temperature is out of the specified range(temperature 0 to 40℃, relative humidity 5%-95%)
 - ◆Direct sunlight or location nearby heat
 - ◆Vibration Area with possibility to get the UPS crashed.
 - ◆Area with erosive gas, flammable gas, excessive dust, etc
9. Keep ventilations in good conditions otherwise the components inside the UPS will be over-heated which may affect the life of the UPS.

1.2 Symbols used in this guide



Risk of electric shock



Read this information to avoid equipment damage

2. Main Features

2.1 Summarization

This UPS is a kind of three phase in/three phase out high frequency battery-integrated UPS, featuring 12 internal battery packs capable of accommodating up to 120 units of 7Ah or 9Ah batteries.

The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Functions and Features

- ◆ Integrated solution for data center

UPS can be integrated with battery cabinet, PDU external maintenance bypass, offering excellent choice for data center.

- ◆ 3Phase In/3Phase Out UPS

It is 3Phase In/3Phase Out high-density UPS system, of which input current is kept in balance. No unbalance problem might occur.

- ◆ Digital Control

This series UPS is controlled by Digital Signal Processor(DSP); enhance, it increases reliability, performance, self-protection, and self-diagnostics and so on.

- ◆ Integrated Battery System

This series of UPS can accommodate up to 12 internal battery packs, supporting a maximum of 120pcs 7AH or 9AH batteries. Users may select the desired number of batteries according to your convenience to optimize space utilization.

- ◆ Charging Current is configurable

Via setting tool, the user may set the capacity of the batteries as well as reasonable charging current as well as maximum charging current. Constant voltage mode, constant current mode or floating mode can be switched automatically and smoothly.

- ◆ Intelligent Charging Method

The series UPS adopts advanced three-stage charging method—

1st stage: high current constant current charging

to guarantee to charge back to 90%;

2nd-stage: Constant Voltage

In order to vitalize battery and make sure batteries are fully charged

3rd stage: floating mode.

With this 3-stage charging method, it extends the life of the batteries and guarantees fast charging.

- ◆ LCD Display

With LCD displays, the user may easily get UPS status and its operational parameters, such

as input/output voltage, frequency & load%, battery % and ambient temperature, etc..

◆ Intelligent Monitoring Function

Via optional SNMP Card, you may remotely control and monitor the UPS.

◆ EPO Function

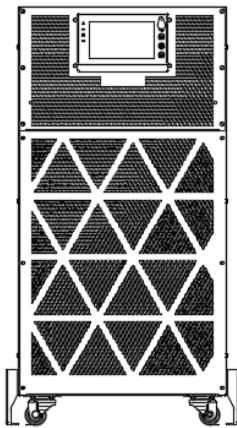
The series UPS may be completely shut off when the EPO is pressed. REPO function(Remote EPO) is also available in this series UPS.

3. Installation

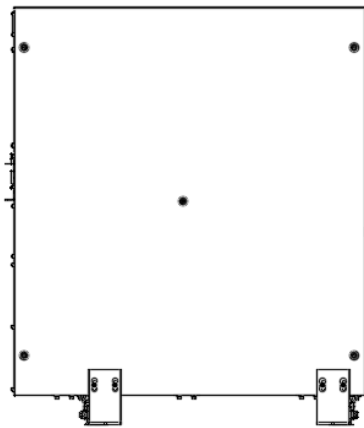
3.1 Unpacking and checking

1. Don't lean the UPS when moving it out from the packaging
2. Check the appearance to see if the UPS is damaged or not during the transportation, do not switch on the UPS if any damage found. Please contact the dealer right away.
3. Check the accessories according to the packing list and contact the dealer in case of missing parts.

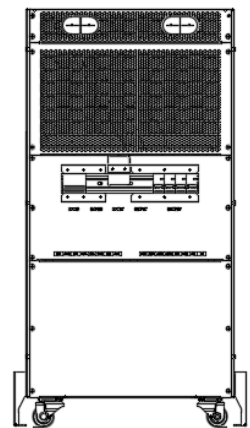
3.2 Cabinet Outlook



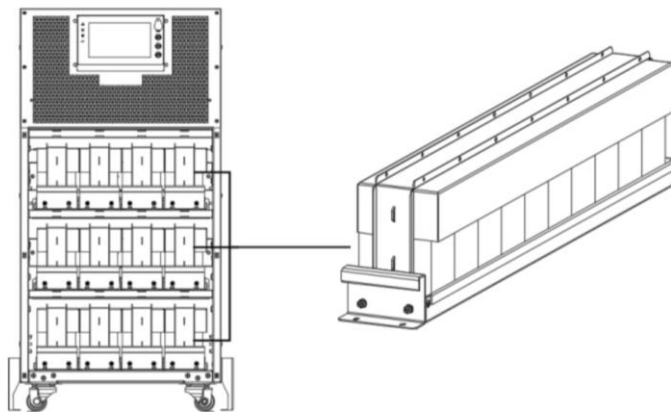
Front View



Side View

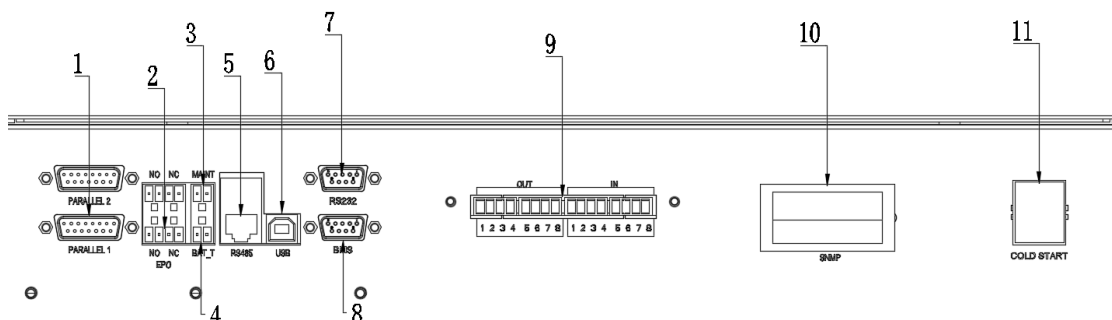


Rear View



Battery Pack Installation View

Control unit



1. PARALLEL port : when two ECU units parallel, two interfaces form a ring.

2. EPO

3. MAINT

4. BAT_T

5. RS485 : 485 communication interface

6. USB

7. RS232

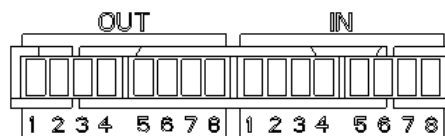
8. BMS (to be opened)

9. Dry contact card (optional)

10. Intelligent slot : SNMP (optional)

11. Cold Start button

Dry-contact unit (optional)



1. Output Dry Contacts: (1)OUT1&OUT2; (2)OUT3&OUT4; (3)OUT5&OUT6; (4)OUT7&OUT8

2. Input Dry Contacts: (1)IN1&IN2; (2)IN3&IN4; (3)IN5&IN6; (4)IN7&IN8;

3.3 Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100cm and 80cm respectively when installing the cabinet.

◆ Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.

◆ The environment temperature around UPS should keep in a range of 0°C~40°C. If the environment temperature exceeds 40°C, the rated load capacity should be reduced by 12% per 5°C. The max temperature can't be higher than 50°C.

◆ If the UPS is dismantled under low temperature, it might be in a condensing condition. The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.

◆ Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.



Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

◆ Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources.



An unused battery must be recharged every 6 months. Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

◆ The highest altitude that UPS may work normally with full load is 1500 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1500 meters, shown as the following table:

(Load coefficient equals max load in high altitude place divided by nominal power of the UPS)

Altitude(m)	1500	2000	2500	3000	3500	4000	4500	5000
Load coefficient	100%	95%	90%	85%	80%	75%	70%	65%

◆ The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any exotic obstacles.

3.4 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

◆ External Battery

The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.

◆ UPS Output

Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.

◆ Over-current

Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system.



Select a thermo magnetic circuit-breaker with an IEC 60947-2 trip curve C (normal) for 125% of the current as listed below.

3.5 Power Cables

◆ The cable design shall comply with the voltages and currents provided in this section, Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media) .



Upon starting. Please ensure that you are aware of the location and operation of the external isolators which are connected to the UPS input/bypass supply of the mains distribution panel. Check to see if these supplies are electrically isolated. And post and necessary warning signs to prevent any inadvertent operation.

3.5.1 Recommended cross-sectional areas for power cables

UPS Cabinet	Cable Dimension			
	AC Input (mm ²)	AC Output (mm ²)	DC Input (mm ²)	Grounding (mm ²)
10kVA	4	4	6	4
15kVA	8	8	15	8
20kVA	8	8	15	8
30kVA	10	10	25	10
40kVA	16	16	35	16

- ◆ When selecting, connecting, and routing power cables, follow local safety regulations and rules.
- ◆ If external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the IEC-60364-5-52 or local regulations.
- ◆ If the rated voltage is 400 V, multiply the currents by 0.95. If the rated voltage is 415 V, multiply the currents by 0.92.
- ◆ If primary loads are non-linear loads, increase the cross-sectional areas of neutral wires 1.5–1.7 times.
- ◆ When the mains input and bypass input share a power source, configure both types of input power cables as mains input power cables. The cables listed in Table are used only when the following requirements are met:
 - Routing mode: Routing the cables over the cable ladder or bracket in a single layer (IEC60364-5-52 middle E).
 - The ambient temperature is 30°C.
 - The AC voltage loss is less than 3%, and the DC voltage loss is less than 1%.
 - 90°C copper flexible cable.
 - The length of the AC power cables of a UPS is no longer than 30 m and DC power cables no longer than 50 m.

3.5.2 Power cable connector requirements

Model	Connector	Connection Mode	Bolt Type	Bolt Hole Diameter	Torque
10-40kVA	Mains input connector	Crimped OT terminals	M6	6.4mm	4.5N•m
	Bypass input connector	Crimped OT terminals	M6	6.4mm	4.5N•m

	Battery input connector	Crimped OT terminals	M6	6.4mm	4.5N•m
	Output connector	Crimped OT terminals	M6	6.4mm	4.5N•m
	Grounding connector	Crimped OT terminals	M6	6.4mm	4.5N•m

3.5.3 Recommended input front-end and output back-end circuit breakers

UPS capacity	Component	Specifications
10-15kVA	Mains input circuit breaker	32A 3P
	Bypass input circuit breaker	32A 3P
	Output branch circuit breaker	32A 3P
20kVA	Mains input circuit breaker	50A 3P
	Bypass input circuit breaker	50A 3P
	Output branch circuit breaker	50A 3P
30kVA	Mains input circuit breaker	63A 3P
	Bypass input circuit breaker	63A 3P
	Output branch circuit breaker	63A 3P
40kVA	Mains input circuit breaker	80A 3P
	Bypass input circuit breaker	63A 3P
	Output branch circuit breaker	63A 3P



Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.



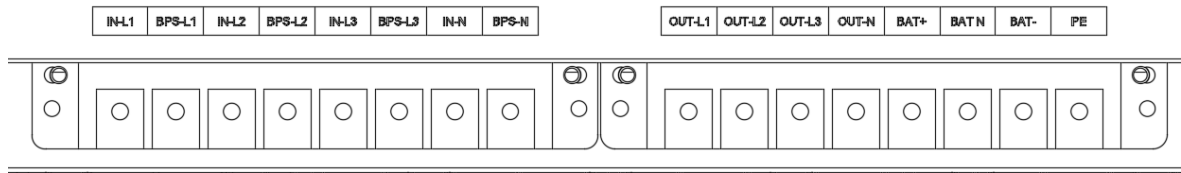
Failure to follow adequate earthing procedures may result in electromagnetic interference or in hazards involving electric shock and fire.

3.6 Power cable connect

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

Verify the UPS is totally isolated from its external power source and also all power isolators of the UPS are open. Check to see if they are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation.

Open the UPS rear panel; Remove the cover of terminals for wiring easily.



The wiring sequence on the terminal strip from left to right is: Main input L1 phase, Bypass input L1 phase, Main input L2 phase, Bypass input L2 phase, Main input L3 phase, Bypass input L3 phase, Main input N phase, Bypass input N phase, Output L1 phase, Output L2 phase, Output L3 phase, Output N phase, Battery positive terminal, Battery N terminal, Battery negative terminal, and Ground.



WARNING!

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends

Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.

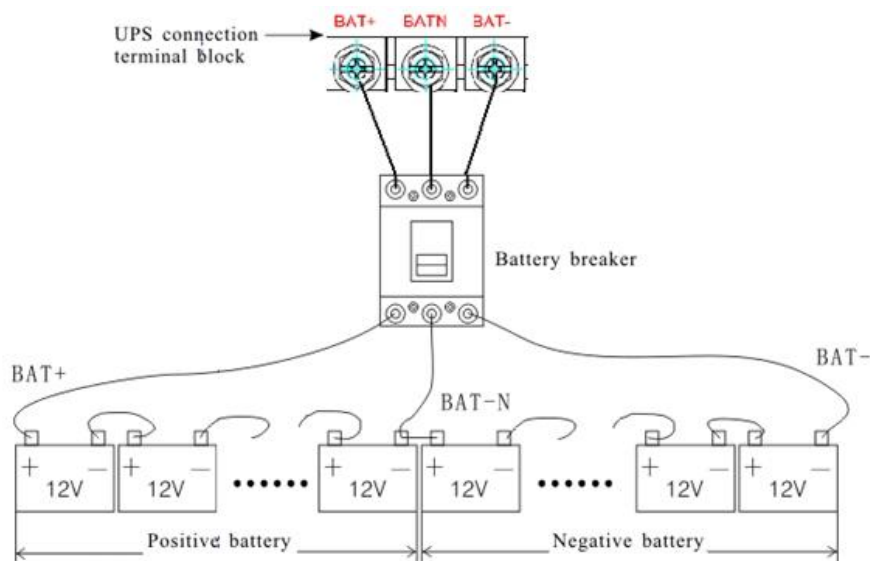


CAUTION!

The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.7 Battery connection

The UPS adopts positive and negative double battery framework. Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire.



Note:

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery.

This UPS supports up to 12 battery packs, with each pack containing 10pcs 12V 7AH or 9AH capacity, totaling a maximum of 120pcs 7AH or 9AH batteries. Please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted manually according to battery capacity selected. All related settings can be done through LCD panel or monitoring software.



Ensure correct polarity battery string series connection. I.e. inter-tier and inter block connections are from (+) to (-) terminals.

Don' t mix batteries with different capacity or different brands, or even mix up new and old batteries, either.



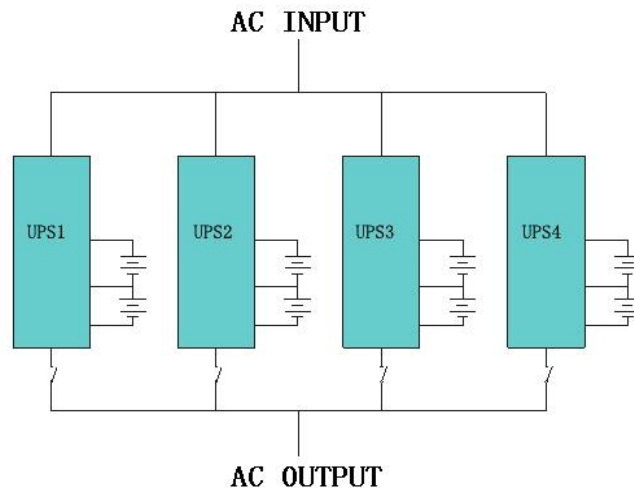
Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

3.8 UPS parallel Installation

The following sections introduce the installation procedures specified to the parallel system.

3.8.1 Cabinet installation

Connect all the UPS needed to be put into parallel system as below picture.



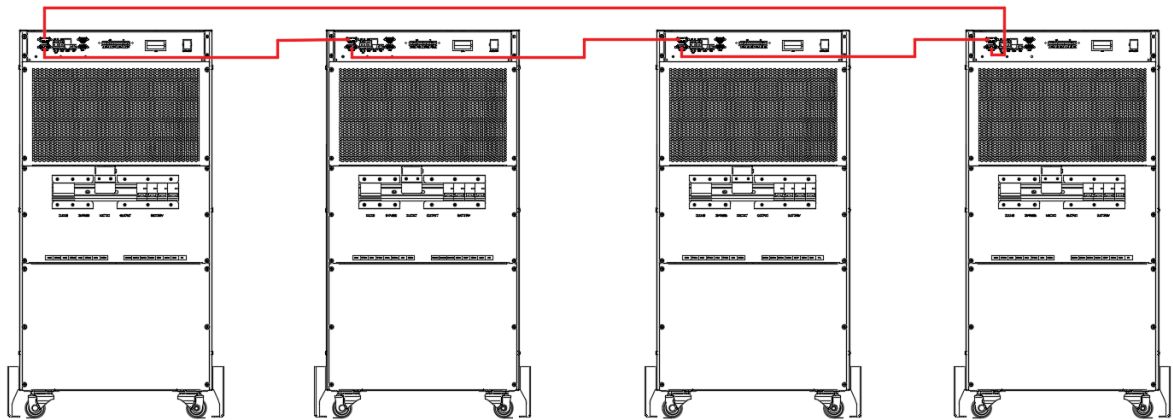
Make sure each UPS input breaker is in "off" position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and common battery.



Make sure the N, A(L1), B(L2), C(L3) lines are correct, and grounding is well connected.

3.8.2 Parallel cable installation

Shielded and double insulated control cables available must be interconnected in a ring configuration between UPS units as shown below. The ring configuration ensures high reliability of the control.



3.8.3 Requirement for the parallel system

A group of paralleled UPS behaves as one large UPS system but with the advantage of presenting higher reliability. In order to assure that all UPS are equally utilized and comply with relevant wiring rules, please follow the requirements below:

- 1) All UPS must be of the same rating and be connected to the same bypass source.
- 2) The outputs of all the UPS must be connected to a common output bus.
- 3) The length and specification of power cables including the bypass input cables and the UPS output cables should be the same. This facilitates load sharing when operating in bypass mode.

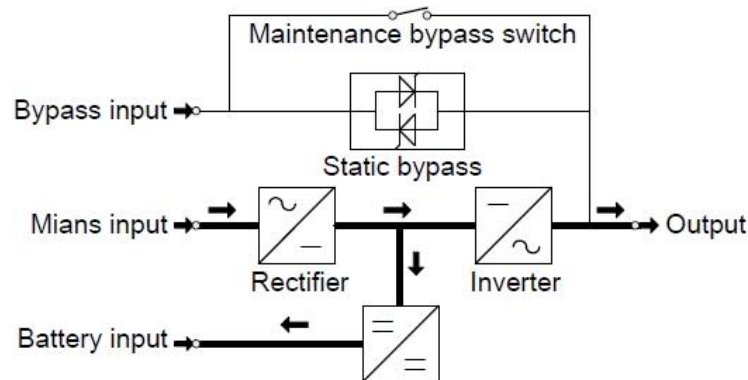
4. Operation

4.1 Operation Modes

The UPS is a double-conversion on-line UPS that may operate in the following alternative modes :

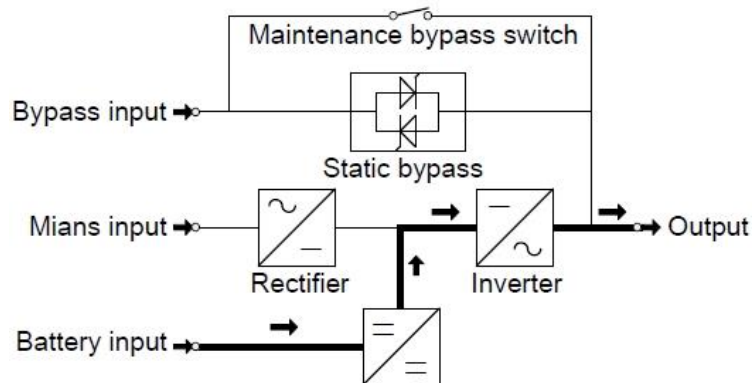
◆ Normal mode

The rectifier/charger derives power from the AC Mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies to the load.



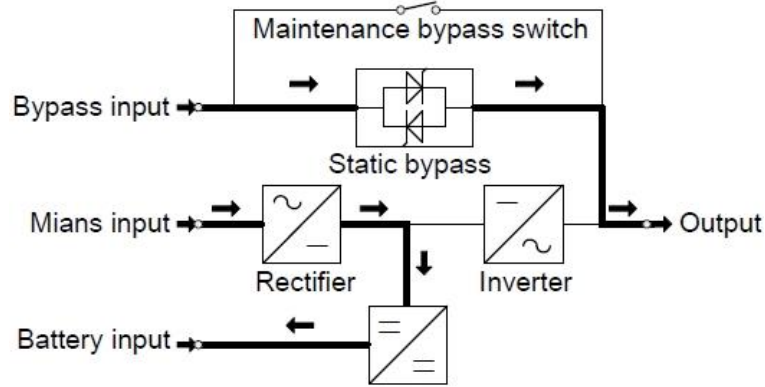
◆ Battery mode (Stored Energy Mode)

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC recovers.



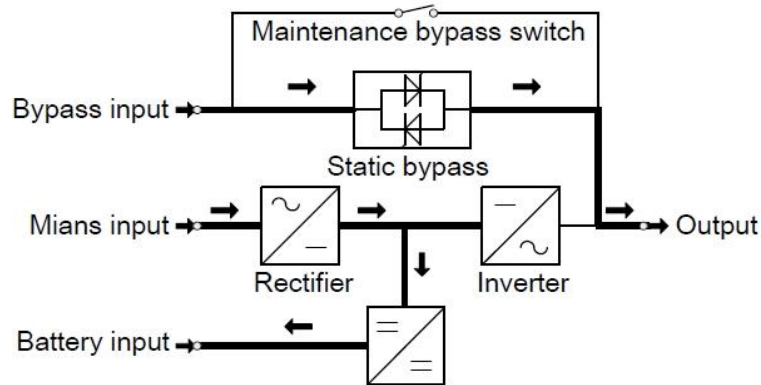
◆ Bypass mode

If the inverter is out of order, or if overload occurs, the static transfer switch will be activated to transfer the load from the inverter supply to bypass supply to the critical load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources.



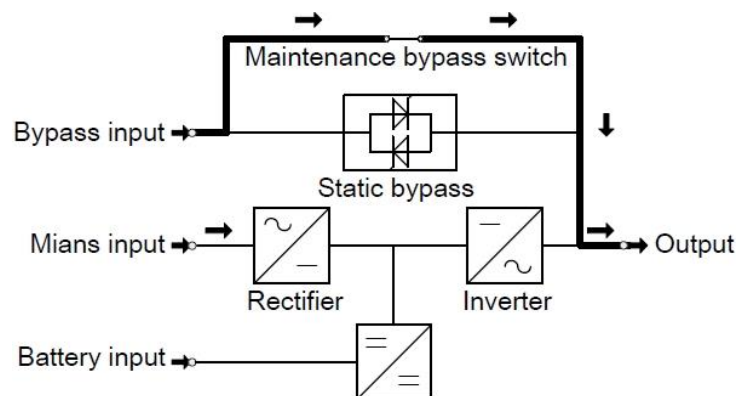
◆ ECO Mode

When the UPS is at AC Mode and the requirement to the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency of the power supplied. At ECO mode, the UPS works at Line-interactive mode, so the UPS will transfer to bypass supply. When the AC is out of set window, the UPS will transfer from bypass to Inverter and supplies power from the battery, and then the LCD shows all related information on the screen.



◆ Maintenance mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair and this manual bypass switch bears for equivalent rated load.



4.2 Turn on/off UPS

4.2.1 Starting procedure



MAKE SURE GROUNDING IS PROPERLY DONE BEFORE POWERING ON!

- ◆ Set the Battery Breaker to the “ON” position according to the user’s manual.



Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals.

- ◆ Turn ON MAINS breaker and BYPASS breaker.

If the rectifier input is within voltage range, the rectifier will start up about 1 minute then the inverter will start up after then.

- ◆ Turn ON OUTPUT breaker.

If the rectifier fails at startup, the bypass LED will light up. When the inverter starts up, the UPS will transfer from bypass mode to inverter mode, then the bypass LED extinguishes and the inverter LED lights up.

No matter whether the UPS can work normally or not, all the status will be shown on the LCD display.

4.2.2 Test procedure



The UPS is operating normally. It may take about 60 seconds to boost up the system and perform self-test completely.

- ◆ Switch off the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption. At this time, the LEDs of battery should be turned on.

- ◆ Switch on the MAINS to simulate utility recovery, the rectifier will restart automatically and the inverter will supply to the load. If using dummy loads for testing, the UPS can be loaded up to its maximum capacity during load test.

4.2.3 MAINTENANCE BYPASS

For enhanced efficiency, the UPS features a manual bypass that allows maintenance bypass to directly supply the load via Main.



The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

- **Switch to mechanical bypass**

- ◆ Open the cover of maintenance switch, the UPS turns to bypass mode

automatically.

- ◆ Turn on MAINTANCE breaker;
- ◆ Switch OFF BATTERY breaker;
- ◆ Switch OFF MAINS breaker;
- ◆ Switch OFF BYPASS breaker;
- ◆ Switch OFF OUTPUT breaker;

At this time the bypass source will supply to the load through the MAINTENANCE breaker.

• Switch to normal operation (from mechanical bypass)



Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults.

- ◆ Turn ON OUTPUT breaker.
- ◆ Turn ON BYPASS breaker.
- ◆ Turn ON MAINS breaker.

Now the UPS powers from the static bypass and the maintenance bypass, then the bypass LED will light up.

- ◆ Switch OFF the maintenance bypass breaker, then the output is supplied by the static bypass of the UPS.
- ◆ Put on the maintenance switch cover.

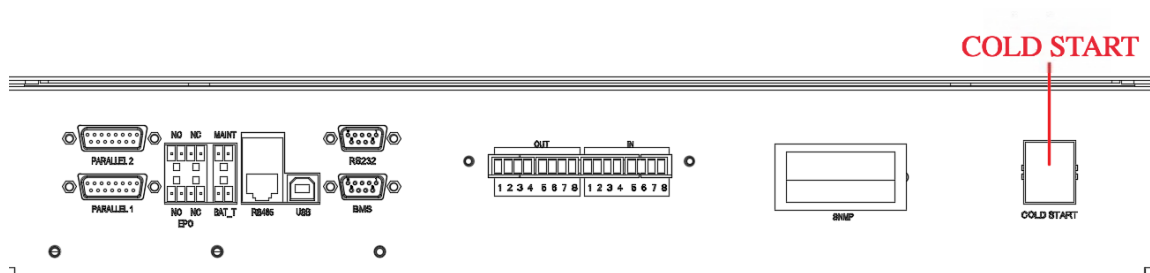
The rectifier will operate normally after a few ten seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.4 Cold start procedure



Follow these procedures when the input AC Utility Failure, but battery is normal.

- ◆ Ensure the UPS battery wiring is correct.
- ◆ Turn on the BATTERY breaker. The battery will feed the Auxiliary power board.
- ◆ Turn on the OUTPUT breaker.
- ◆ Trigger the COLD START button about 3s as the position 11 of the below drawing.



When battery normal, rectifier starts operation, a few moment later, inverter starts and operates and battery LED on, Cold start procedure completed.



Please press the cold start button 30 seconds after closing the battery switch.

4.2.5 Shut down procedure



This procedure can completely shut down the UPS and the LOAD. After all power switches, isolators and circuit breakers are opened, there will be no output.

- ◆ Operate the LCD screen to turn off the inverter and select UPS-shutdown.
- ◆ Switch OFF the BATTERY breaker;
- ◆ Switch OFF the MAINS breaker.
- ◆ Switch OFF the BYPASS breaker.
- ◆ Switch OFF the OUTPUT breaker. The UPS shuts down;
- ◆ To completely isolate the UPS from AC Mains, all input switches of Utility shall be completely off, which includes the ones for rectifier and bypass.
- ◆ The primary input distribution box, which is often located far away from the UPS area, so a label should be posted to advise service personnel that the UPS circuit is under maintenance.



Wait for about 5 minutes for the internal D.C. bus bar capacitors to be completely discharged.

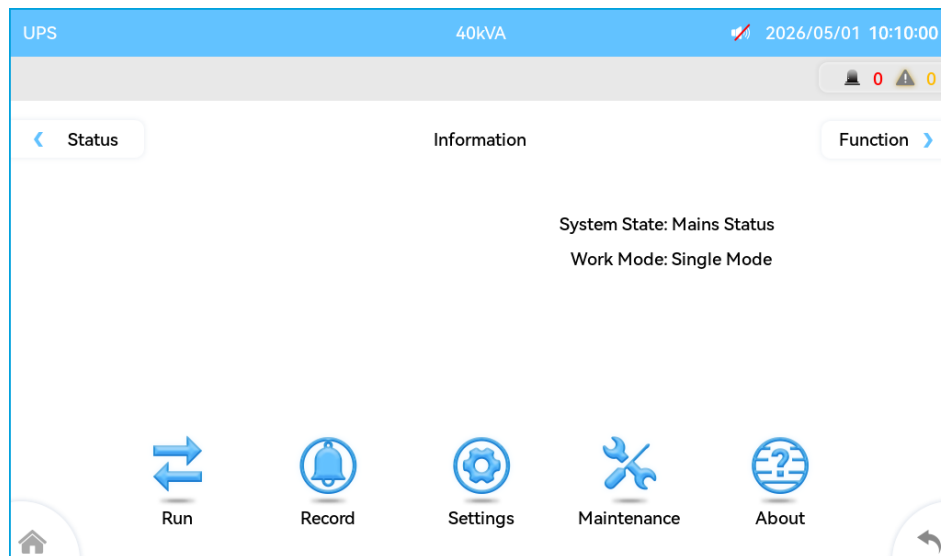
4.2.6 Parallel setting

- ◆ Connect parallel cable, input/output cable, and battery cable well;
- ◆ Measure the positive and negative battery pack voltage. Battery switch is opened temporarily.
- ◆ Switch ON the output switch.
- ◆ According to the startup procedure for single unit, set the operation mode of each UPS: single mode is changed to parallel mode; set the parallel number for each UPS; up to 4 units can be parallel; set the ID of each UPS, the ID of each unit must be different.
- ◆ Switch ON the input and bypass switch. Close the external input switch and start from mains.
- ◆ After start from mains, check the LCD interface of each UPS to see if the ID, VA is the same with the actual values.
- ◆ Switch ON the external battery switch of each UPS. Check if the charging current displayed in LCD is normal.



The UPS cannot be parallel until each single unit is normal.

4.3 The LCD Display



LCD panel

4.4 Options

4.4.1 SNMP card

The SNMP card slot is pre-installed in the UPS. Here are the installation and removal steps:

- ◆ Loosen the 2 torque screws (on each side of the card).
- ◆ Carefully pull out the card. Reverse the procedure for re-installation

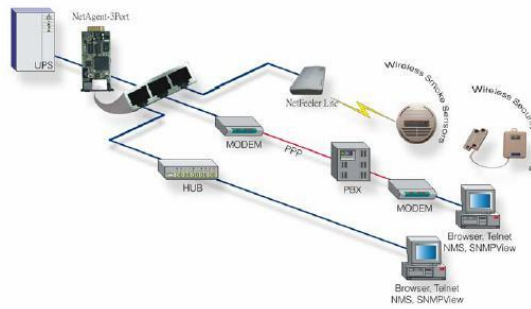


SNMP

The slot called SNMP supports the MEGAtec protocol. We advise that NetAgent II-3 port is also a tool to remotely monitor and manage any UPS system

NetAgent II-3Ports supports the Modem Dial-in (PPP) function to enable the remote control via the internet when the network is unavailable.

In addition to the features of a standard NetAgent Mini, NetAgent II has the option to add NetFeeler Lite to detect temperature, humidity, smoke and security sensors. Thus, making NetAgent II a versatile management tool. NetAgent II also supports multiple languages and is setup for web-based auto language detection.



Typical topology of the UPS Network Management

4.4.2 Dry contact card

The card is used for providing the interface for UPS peripheral monitoring. The contact signals can reflect UPS running status. The card is connected to peripheral monitoring devices via DB9 female to facilitate the effective monitoring of the real-time status of UPS and timely feedback the status to monitor when abnormal situation occurs (such as UJPS failure, mains interruption, UPS bypass and etc.). It is installed in the intelligent slot of the UPS.



10-40kVA

Appendix 1 Specifications

Capacity		10kVA	15kVA	20kVA	30kVA	40kVA
Input	Phase	3 Phase 4 Wires and Ground				
	Rated Voltage	380/400/415Vac				
	Operating voltage range	138~485Vac ; linear derating 138V~305Vac, no derating 305~485Vac				
	Operating frequency range	40Hz-70Hz				
	Power factor	≥0.99				
	THDi	≤3% (100% linear load) ; ≤5% (100% non-linear load)				
	Bypass voltage range	Max.voltage: 220Vac +25%(optional +10%,+15%,+20%); 230Vac: +20%(optional +10%,+15%); 240Vac: +15%(optional +10%)				
		Min. voltage:-45 %(optional -20%,-30%)				
		Frequency protection range: ±10%				
Generator input	Support					
Output	Phase	3 Phase 4 Wires and Ground				
	Output voltage	380/400/415Vac				
	Power factor	1.0				
	Voltage regulation	±1%				
	Output frequency	Utility Mode: ±1%/±2%/±4%/±5%±10% optional; Battery Mode:(50/60±0.1%)Hz				
	Crest factor	3:1				
	THDv	≤2% with linear load; ≤4% with non linear load				
	Efficiency	95.0%				
	Overload	Load≤110%, last 60min; ≤125%, last 10min; ≤150%, last 1min; >150% change to bypass				
Battery	Battery Number	120pcs 12V 7AH or 9AH Max.				
	Charge Current	5A Max.			10A Max.	
Transfer Time		Utility to Battery : 0ms; Utility to bypass: 0ms				
Environment	Operating temperature	0℃~40℃				
	Storage temperature	-25℃~55℃(no battery)				
	Humidity range	0~95% (non condensing)				
	Altitude	< 1500m				
	Noise level	<55dB				
Protection	Alarm	overload, utility abnormal, UPS fault, battery low, etc				
	Protection	short circuit, overload, over temperature, battery low, fan fault alarm				
	Communication	USB, RS485, Parallel card, Dry contact card(optional), SNMP card(optional), temperature sensor (optional)				
Physical	Dimensions D*W*H(mm)	850*500*1005				
	Net Weight (kg)	126	126	126	128	130
Standards		EN62040-1, EN62040-2, EN62040-3				

Appendix 2 Problems and Solution

In case the UPS cannot work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If all these aspects are checked without any problem, please consult with local agent right away and provide below information.

(1) Product model name and serial number.

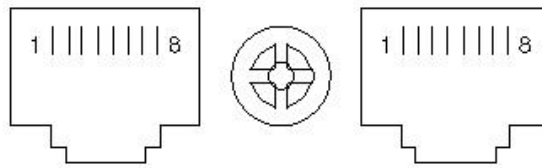
(2) Try to describe the fault with more details, such as LCD display info, LED lights status, etc.

Read the user manual carefully, it can help a lot for using this UPS in the right way. Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

No.	Problem	Possible reason	Solution
1	Utility is connected but the UPS cannot be powered ON.	Input power supply is not connected; Input voltage low; The input switch of the UPS is not switched on.	Measure if the UPS input voltage/frequency is within the window. Check if UPS input is switched on
2	Utility normal but Utility LED does not light on, and the UPS operates at battery mode	The input breakers of the UPS are not switched on; input cable is not well connected	Switch on the input breaker; Make sure the input cable is well connected.
3	The UPS does not indicate any failure, but output do not have voltage	Output cable does not well connected; Output breaker do not switch on	Make sure the output cable is well connected; Switch on the output breaker.
4	Battery LED is flashing but no charge voltage and current	Battery breaker does not switch on, or batteries are damaged, or battery is reversely connected. Battery number and capacity are not set correctly.	Switch on the battery breaker. If batteries are damaged, need to replace whole group batteries, Connect the battery cables correctly; Go to LCD setting of the battery number and capacity, set the correct data.
5	Buzzer beeps every 0.5 seconds and LCD display "output overload"	Overload	Remove some load
6	The UPS only works on bypass mode	The UPS is set to ECO mode, or the transfer times to bypass mode are limited.	Set the UPS working mode to UPS type(non-parallel) or to reset the times of transferring to bypass or re-start the UPS
7	Cannot Black start	Battery switch is not properly closed: Battery fuse is not open: Or Battery low: Battery quantity set wrong; Power breaker in the rear panel not switch ON.	Close the battery switch: Change the fuse: Recharge the battery: Power ON the UPS with AC to set the battery quantity & quantity; Switch on the power breaker.

Appendix 3 RS485 communication port definition

Definition of port:



Connection between the Device's RS485 port and UPS RS485 port.

device(RJ45)	UPS(RJ45)	Description
Pin 1/5	Pin 1/5	485+ "A"
Pin 2/4	Pin 2/4	485 - "B"

Available function of RS485

- ◆ Monitor UPS power status.
- ◆ Monitor UPS alarm info.
- ◆ Monitor UPS running parameters.
- ◆ Timing off/on setting.
- ◆ Battery environment temperature monitoring.

Communication data format

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none

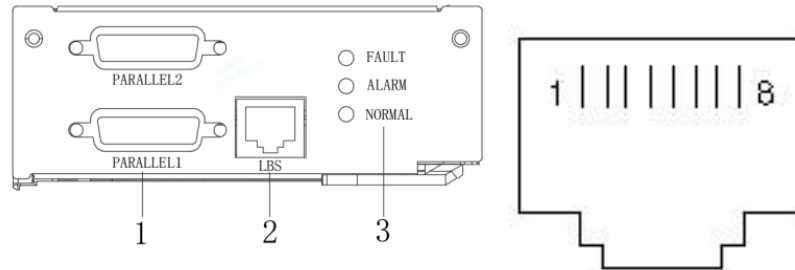


USB, RS232, and RS485 interfaces cannot be used simultaneously. Only one interface can be used!

Appendix 4 LBS communication port definition

LBS communication is compatible with 60-200kVA UPS.

Definition of Male port:



Instruction:

UPS(RJ45)	UPS(RJ45)	Instruction
Pin 1/2/3	Pin 1/2/3	LBS
Pin 5/7/8	Pin 5/7/8	GND

Function description :

- ◆ Enables two UPS units to form a dual-bus system.

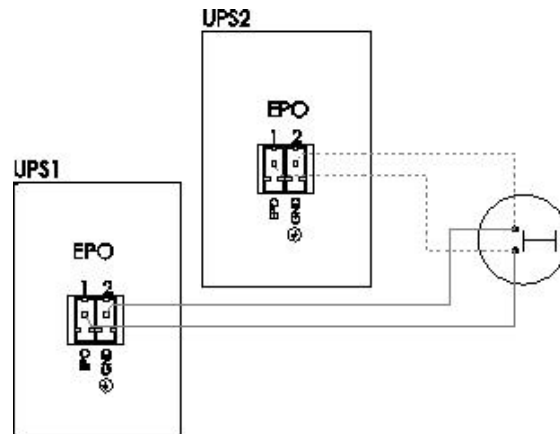


LBS communication lines must not use stranded wires; parallel wires are required.

Appendix 5 REPO instruction

Definition of port:

Connection diagram:



Connection between the button and UPS REPO port.

Button	UPS REPO	Description
Pin 1	Pin 1	EPO
Pin 2	Pin 2	GND

- ◆ A remote emergency stop switch (Photocoupler contact signal and “normally open” - not provided) can be installed in a remote location and connection through simple wires to the REPO connector.
- ◆ The remote switch can be connected to several UPS in a parallel architecture allowing the user to stops all units at once.



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