CONSNANT®
Constant Electric Power

Uninterruptible Power Supply
CNG310/CNG330

user's manual

CNG330 10-100kva(3/1)
CNG330 10-400kva(3/3)

CONTENTS

SAFETY

ATTENTION

This manual contains instructions for installing and operating the UPS. Please have professionally trained personnel carefully read this manual before installation, as it contains essential instructions for use. Please keep it properly!

SAFETY REGULATIONS

- The product must not be used unless it is connected to earth.
- The first connection to make is the connection between the grounding leas and the terminal indicated with the symbol： 
- All maintenance operations inside the product must be carried out by trained personnel.
- High voltages are present inside the equipment even when the input and battery switch are off.
- If it is necessary to replace the fuses, they must be replaced with other fuses of the same type. (Please refer to the "SETTING INPUTI/OUTPUT WIRING" chapter)
- If it is necessary to cut off the mains power supply to the UPS, please disconnect all the switches located behind the front door, or switch on the “SYSTEM OFF” command on the control panel of the UPS.

BATTERY REPLACEMENT MUST BE CARRIED OUT BY PROFESSIONAL PERSONNEL.
FOR THE REPLACED BATTERIES, PLEASE SUBMIT TO A PROFESSIONAL WASTE BATTERY DISPOSAL COMPANY FOR PROPER DISPOSAL. BECAUSE THE BATTERY MAY CONTAIN THE SUBSTANCES TAHT MAY POLLUTE THE ENVIRONMENT.

Due to the continuous improvement and development of this product, the contents of this manual are subject to change without prior notice. Please feel free to contact us for the latest information.

EMC REQUIREMENTS

This product, "Uninterruptible Power Supply" (UPS) models, is CE marked and complies with the basic electromagnetic interference requirements: EMC Directive 89/336 e 92/31 a 93/68 ECC.

USAGE INSTRUCTIONS:
This product is designed for use in industrial and commercial environments. All communication cables (remote and RS232) must be shielded cable to ensure that the signal is not interfered.

WARNING:
The product is a class A UPS.
In a residential environment, this product may cause radio interference, in this case the user may be required to take appropriate measures.
Example: When the TV or radio is interfered, this product can be moved to a suitable distance to reduce the interference situation.

STORAGE

The storage conditions for this product are as follows:
Temperature: 0°-40°C (32°-104°F)
Relative humidity: <95% max.

UPS with internal BATTERIES:
The batteries inside the UPS are self-discharging due to chemical changes.

If you are not going to use the product immediately, please pay attention to the recharging date on the outer box (this is indicated only if the UPS contains batteries), and recharge it within the time limit!
To recharge batteries, just power up the UPS and leave it on NORMAL OPERATION for at least 24 hours.

INSTALLATION ROOM

When choosing a suitable installation room, take note of the following:

- Avoid excessive dust or other dusty substances in the air.
- Confirm that the floor is strong enough to support the weight of the UPS and the battery cabinet
- Confirm that the installation room has enough space and will not make normal maintenance operations difficult.
- Check the ambient temperature when the UPS is running. It should be between 0 and 40℃.

  The UPS is able to function in an ambient temperature of between 0 and 40℃. The recommended operating temperature for the UPS and the batteries is between 20 and 25℃. In fact, the average lifespan of a battery at 20℃ is 4 years. If the operating temperature is increased to 30℃, the battery life is halved.
- Avoid direct sunlight and heat sources

In order to maintain the temperature of the installation room as described above, please install an appropriate heat exhaust system.

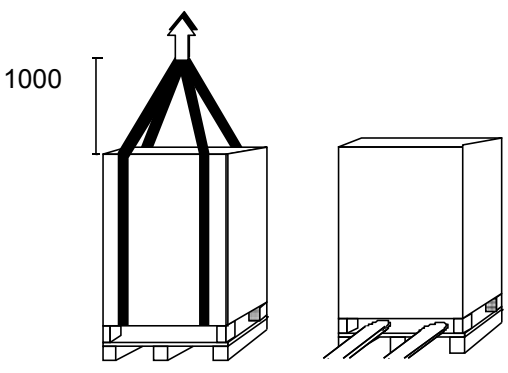
The following methods can be used:
- Natural ventilation;
- Forced ventilation, recommended if the exterior temperature (e.g. 20℃) is lower than the temperature at which you wish to run the UPS (e.g. 25℃);
- Air conditioning system, recommended if the exterior temperature (e.g.30℃) is higher than the temperature at which you wish to run the UPS (e.g. 25℃);

PRELIMINARY OPERATIONS

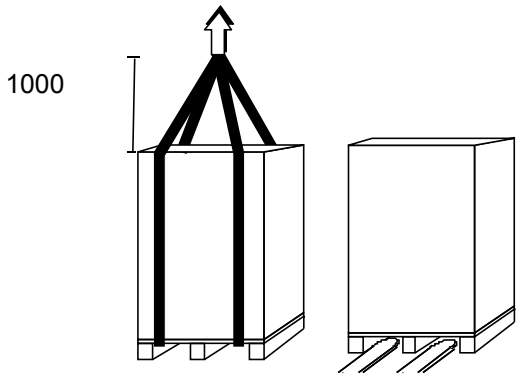
CHECKING THE PACKING CASE

When you receive the product, please check if the packing case has been damaged during transportation. And check if both the two anti-shock devices fixed to the packing case have turned red.
If so, please follow the instructions given on the packing case.
Please open the case carefully to avoid damaging the UPS cabinet.

Be careful when removing the packing case to avoid scratching or dropping the UPS.



UNLOAD FROM PALLET



SHIP BY APPROPRIATE MEANS

The UPS is delivered with :
- Warranty
- User's Manual
- Battery Fuse (if the UPS contains batteries)

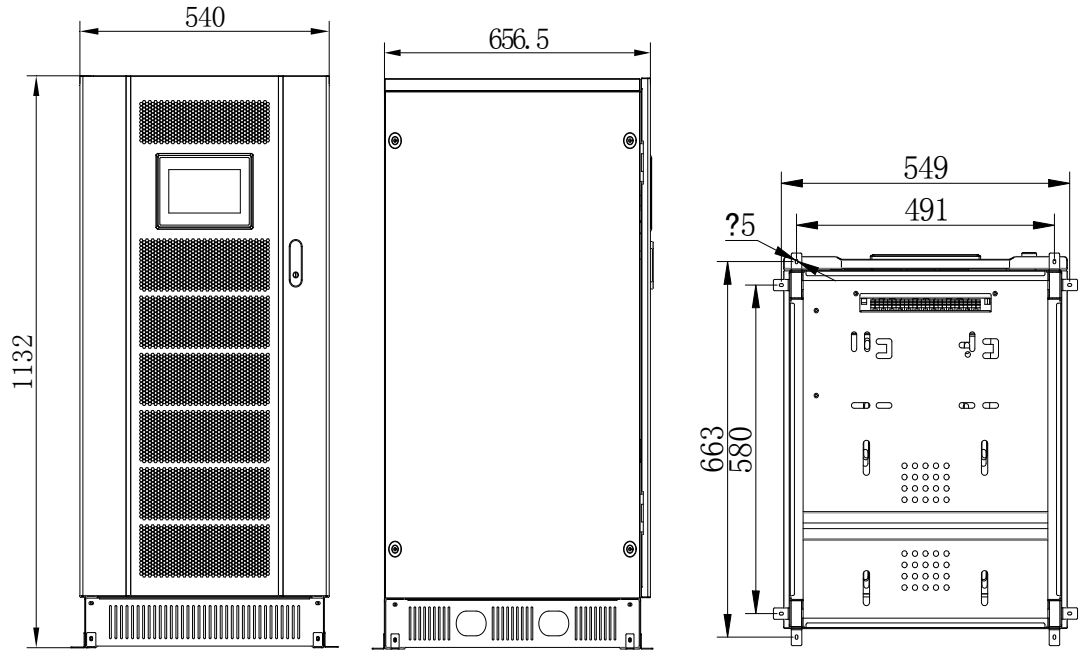
POSITIONING

You should bear in mind the following points when positioning the UPS:

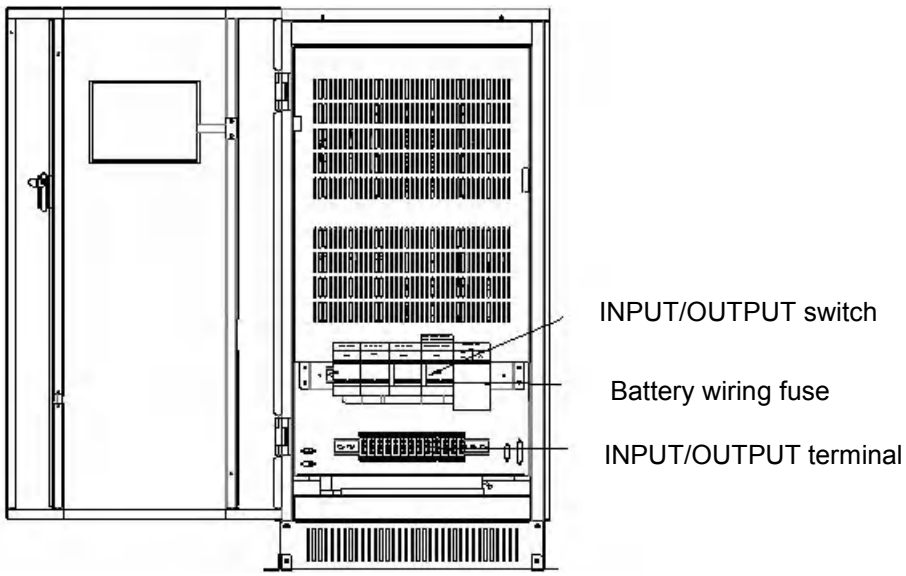
- A space of at least one metre must be kept in front of the UPS to leave plenty of room for maintenance operations.
- A space of at least 20 cm must be left between the back of the UPS and the wall to keep the cooling fan exhausting heat efficiently, and at least 40 cm for maintenance operations.
- Do not place any objects on the top of the UPS.

The AC-DC input/output cables can enter from the bottom or rear of the UPS.

- UPS 10 - 40KVA

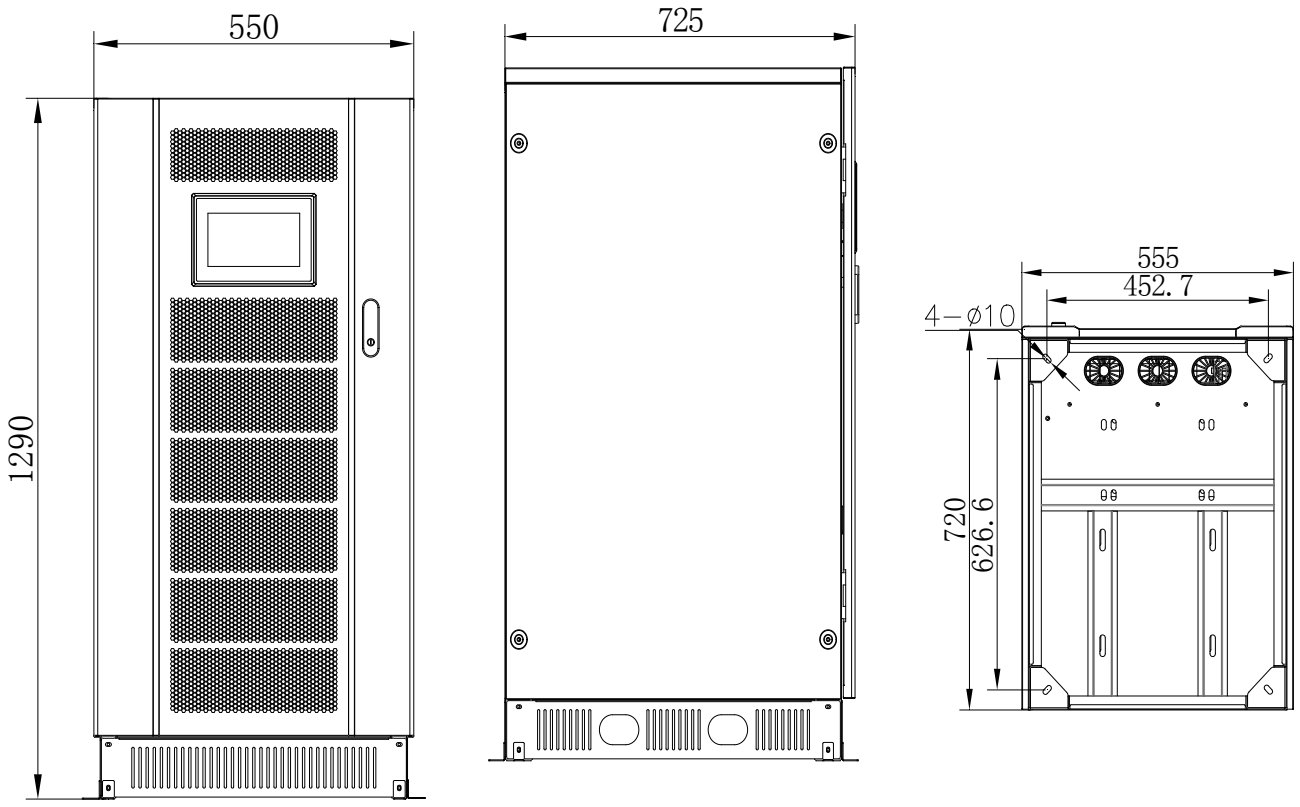


FRONT SIDE BOTTOM



FRONT DOOR OPEN

UPS 60 - 80KVA



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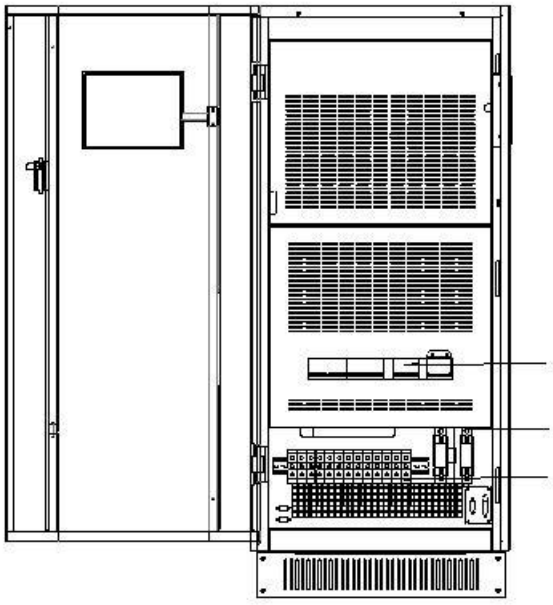
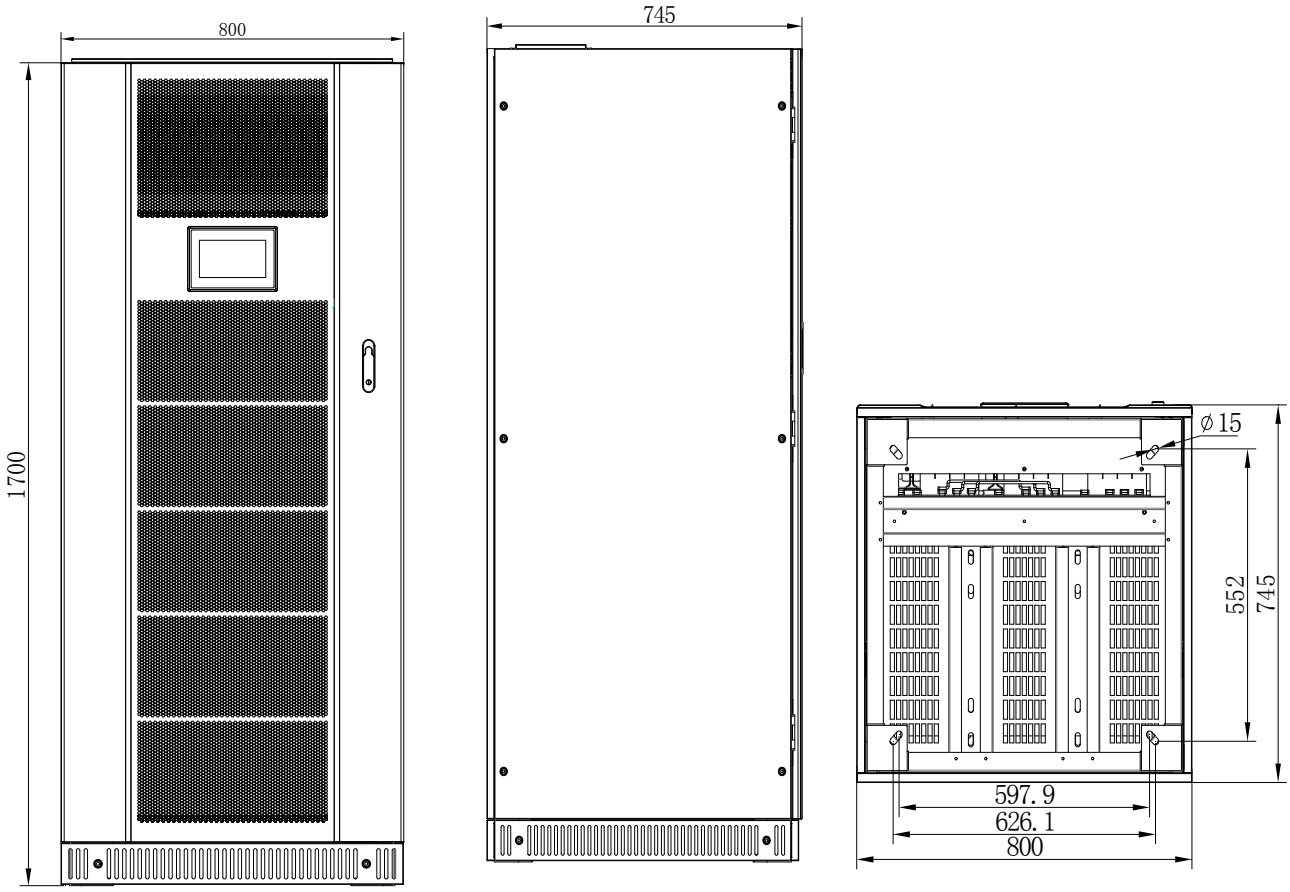
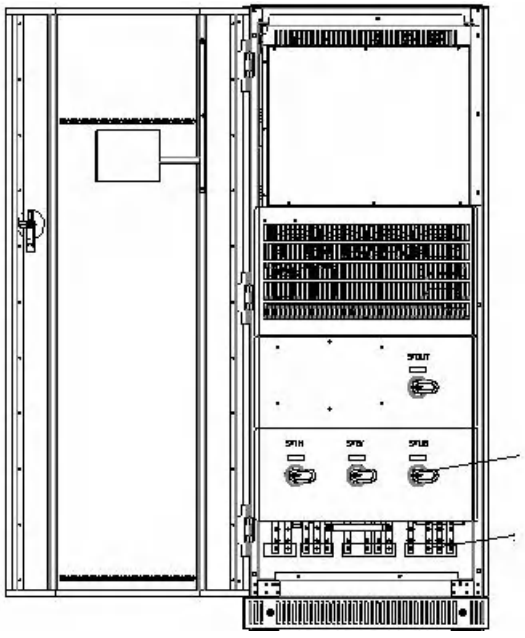


FRONT DOOR OPEN

- UPS 100 - 120KVA



FRONT SIDE BOTTOM

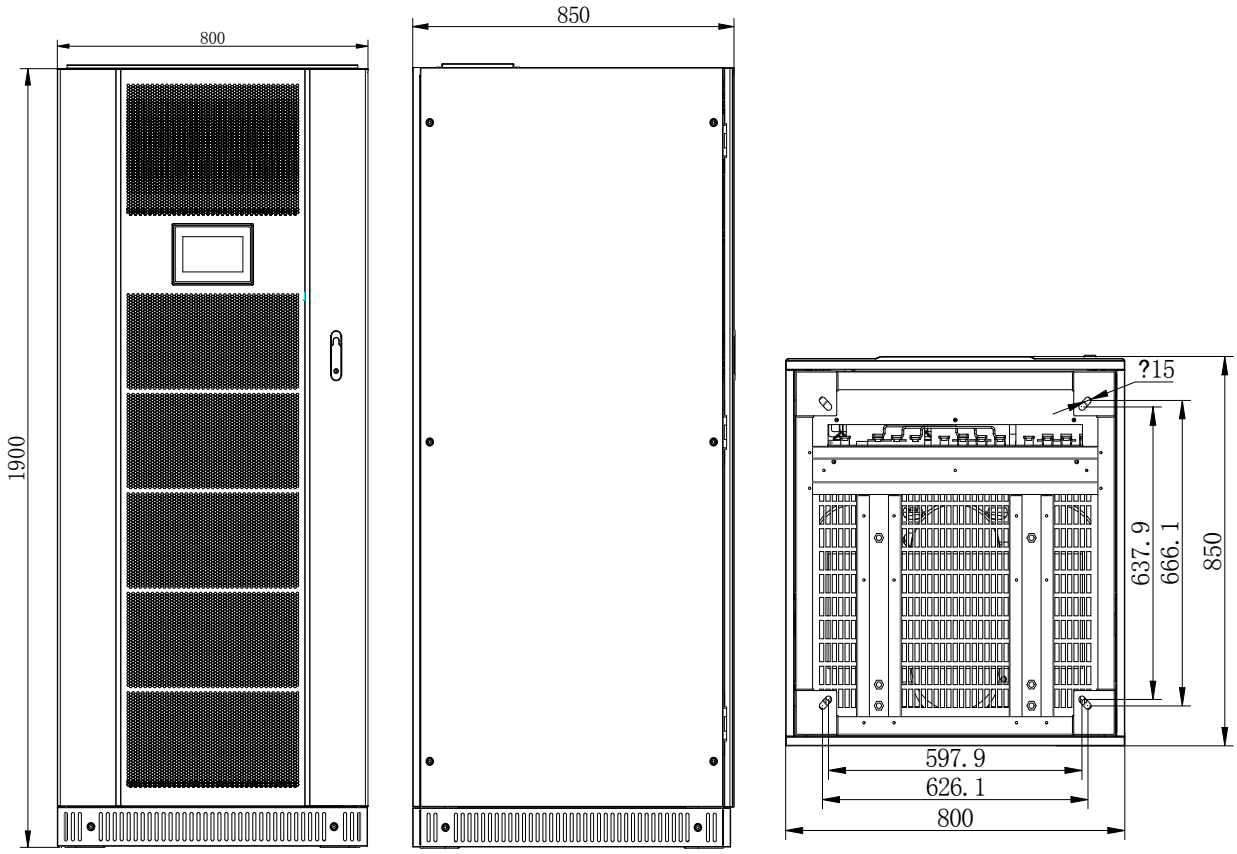


INPUT/OUTPUT switch

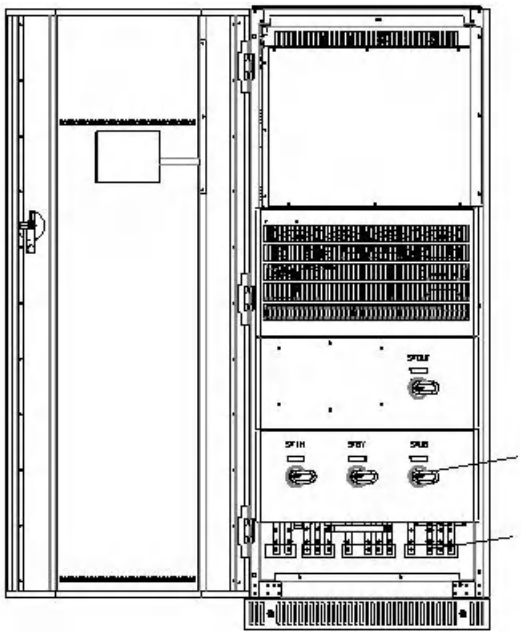
INPUT/OUTPUT wiring copper bar

FRONT DOOR OPEN

- UPS 160 - 200KVA

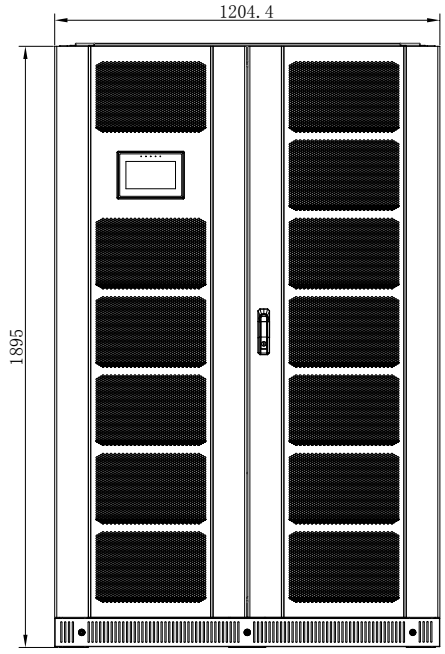


FRONT SIDE BOTTOM

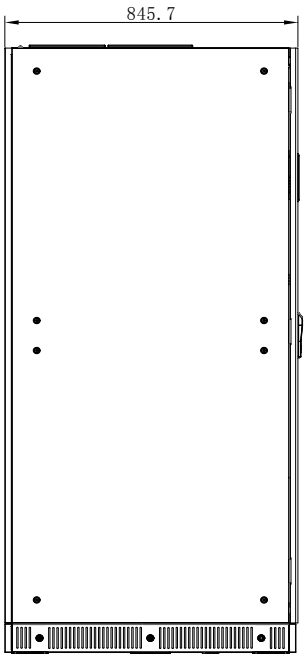


FRONT DOOR OPEN

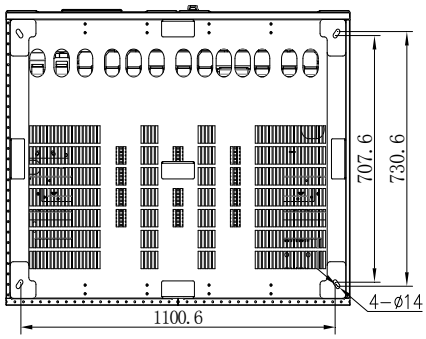
- UPS 250 - 400KVA



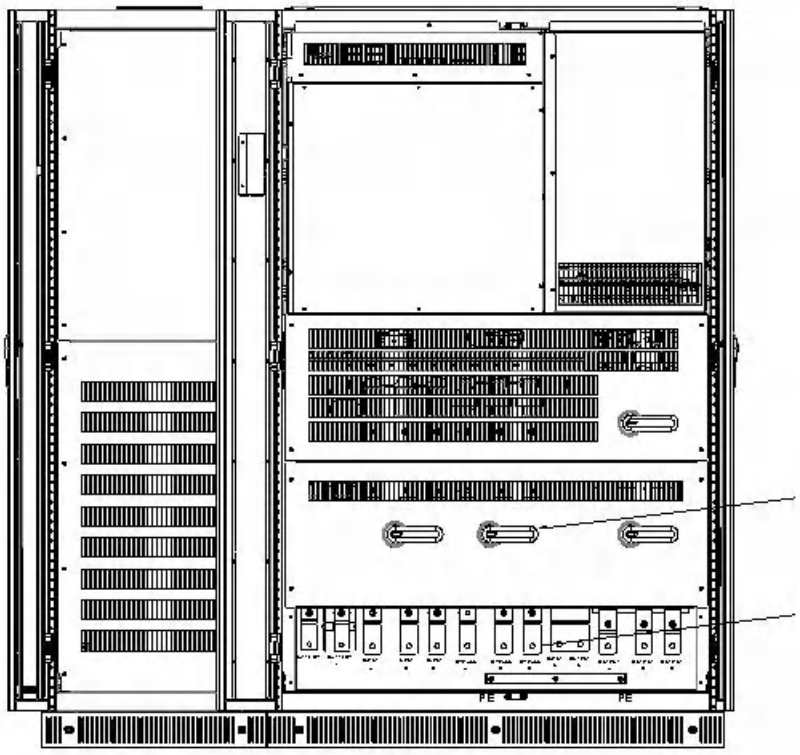
FRONT



SIDE



BOTTOM



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FRONT DOOR OPEN

SETTING INPUT/OUTPUT WIRING

PROTECTIONS

Inside the UPS.
The switches an fuses installed on the UPS input/output lines are given below. A fuse must always be replaced by a fuse of the same capacity and with the same characteristics as those mentioned in the table.

SINGLE-PHASE OUTPUT UPS

10-100K Internal Protections							
UPS Type	Breakers Plastic case switch for models above 80K		Switch		Battery fuse	By-pass fuse	Max. Input Current	Rated output current
[kVA]	Input rectifier	By-pass line input	Output		Maintenance		[A]	[A]
	SWIN	SWBY	SWOUT	SWMB	FB1/2	FSCR	max	Nominal
10	32A(3P) type C	32A(3P) type C	32A(3P) type C		32A(10x38)	25A(10x38)gG	18	36
15	32A(3P) type C	32A(3P) type C	32A(3P) type C		50A(14x51)	25A(10x38)gG	27	55
20	40A(3P) type C	40A(3P) type C	40A(3P) type C		80A(22x58)	25A(10x38)gG	36	73
30	63A(3P) type C	63A(3P) type C	63A(3P) type C		100A(22x58)	32A(10x38)gG	55	109
40	63A(3P) type C	63A(3P) type C	63A(3P) type C		100A(22x58)	32A(10x38)gG	63	145
60	100A(3P) type C	100A(3P) type C	100A(3P) type C		160A (NHO)	32A(10x38)gG	100	218
80	125A(3P) type C	125A(3P) type C	125A(3P) type C		160A (NHO)	32A(10x38)gG	125	290
100	225A(3P) type F	225A(3P) type F	225A(3P) type F		250A (NHO)	100A(22x58)gG	182	364

THREE-PHASE OUTPUT UPS

UPS: 10-40KVA

Internal Protections								
UPS Type	Breakers		Switch		Battery fuse	Static Switch fuse	Max. input current	Output current
[kVA]	Input rectifier	By-pass line input	Output, maintenance bypass		Battery		[A]	[A]
	SWIN	SWBY	SWOUT	SWMB	FB1/2	FUSE-SCR		Nominal
10	40A(3P) type C	40A(3P) type C	32A(3P) type C		32A 10x38	32A (gG) 10x38	1	12
15	40A(3P) type C	40A(3P) type C	32A(3P) type C		50A 14x51	32A (gG) 10x38	2	18
20	40A(3P) type C	40A(3P) type C	32A(3P) type C		50A 22x58	32A (gG) 10x38	3	24
30	63A(3P) type C	63A(3P) type C	63A(3P) type C		100A 22x58	32A (gG) 10x38	5	36
40	100A(3P) type C	100A(3P) type C	63A(3P) type C		100A 22x58	32A (gG)	7	48

UPS: 50-80KVA

Internal Protections								
UPS Type	Breakers		Switch		Battery fuse	Static Switch fuse	Max. input current	Output current
[kVA]	Input rectifier	By-pass line input	Output, maintenance bypass		Battery		[A]	[A]
	SWIN	SWBY	SWOUT	SWMB	FB1/2	FUSE-SCR		Nominal
50	100A(3P) type C	100A(3P) type C	100A(3P) type C		160A	32A (gG) 10x38	90	60
60	100A(3P) type C	100A(3P) type C	100A(3P) type C		160A	32A (gG) 10x38	108	72
80	125A(3P) type C	125A(3P) type C	100A(3P) type C		200A	32A (gG)	144	96

UPS: 100-200KVA

Internal Protections							
UPS Type	Breakers		Switch	Battery fuse	Static Switch fuse	Max. input current	Output current
[kVA]	Input rectifier	By-pass line input	Battery	Battery		[A]	[A]
	SWIN	SWBY	Output, maintenance bypass	FUSE-BAT	FUSE-SCR		Nominal
100	200A(3P) type C	200A(3P) type C	200A(3P) type C	280A	200A	180	120
120	225A(3P) type C	225A(3P) type C	225A(3P) type C	320A	250A	216	144
160	250A(3P) type C	250A(3P) type C	250A(3P) type C	400A	300A	288	192
200	350A(3P) type C	350A(3P) type C	350A(3P) type C	500A	400A	360	240

UPS: 250-400KVA

Internal Protections							
UPS Type	Isolating switch		Isolating switch	Isolating switch	Static Switch fuse	Max. input current	Output current
[kVA]	Input rectifier	By-pass line input	Output, maintenance bypass	Battery		[A]	[A]
	SWI	SWBY	SWOUT.SWMB	SWBAT	FUSE-SCR		Nominal
250	400A(3P)	400A(3P)	400A(3P)	630A(2P)	400A	40	300
300	630A(3P)	630A(3P)	630A(3P)	800A(2P)	630A	48	360
350	630A(3P)	630A(3P)	630A(3P)	800A(2P)	630A	56	420
400	630A(3P)	630A(3P)	630A(3P)	800A(2P)	630A	0	480

UPS INPUT

When selecting the input protections, you must take into consideration the maximum current absorbed in the two operating conditions :

- In “NORMAL OPERATION”, from the input to the rectifier, the “max input current” is indicated in the above table. The automatic breaker is at the input side of the rectifier, namely “SWIN” as shown in above table.
- In “BY-PASS OPERATION”, the maximum current value of the bypass is protected by the circuit breaker "SWBY"

UPS OUTPUT, SHORT CIRCUITS AND SELECTIVITY.

The rated input and output current is shown in the table above

Short circuit

When short circuit occurs, the UPS protects itself by restricting the output current value it supplies (short circuit current). When a short circuit occurs at the output end, the operating conditions can be divided into two aspects:

- UPS in NORMAL OPERATION:
  UPS will immediately switch to bypass mode, and before the fuse acting, the current value will be as shown in the BY-PASS SPECIFICATION table
- UPS in BATTERY OPERATION:
  UPS will supply twice the rated output current (0.1s).

Output Fuse Selectivity

In NORMAL OPERATION, selectivity as below table item 1) , (type gG)

If you want to gurantee the BATTERY OPERATION, you can also choose as below table item 2), (type gG)

- Single-phase output UPS

[KVA]	10	15	20	30	40	50	60	80	100
Max. current [A] of UPS output fuse									
1) NORMAL OPERATION	36	54	72	109	145	181	245	290	363
2) BATTERY OPERATION	25	40	50	80	100	125	150	200	250

-Three-phase output UPS

Three-phase output UPS: 10-40KVA

[KVA]	10	15	20	30	40
Max. current [A] of UPS output fuse					
1) BATTERY OPERATION	16	25	32	40	50
2) NORMAL OPERATION	25	32	40	50	63

Three-phase output UPS: 50-80KVA

[KVA]	50	60	80
Max. current [A] of UPS output fuse			
1) BATTERY OPERATION	63	80	100
2) NORMAL OPERATION	80	100	125

Three-phase output UPS: 100-200KVA

[KVA]	100	120	160	200
Max. current [A] of UPS output fuse				
1) BATTERY OPERATION	125	160	200	250
2) NORMAL OPERATION	160	200	250	300

Three-phase output UPS: 250-400KVA

[KVA]	250	300	350	400
Max. current [A] of UPS output fuse				
1) BATTERY OPERATION	300	350	400	450
2) NORMAL OPERATION	350	400	450	500

LEAKAGE CURRENT CIRCUIT BREAKER

For the standard model, the bypass without isolation transformer, the neutral lines of the UPS output and the mains are connected together

* When the input and output neutral lines are connected together, the power systems of the front and the rear of the UPS are consistent.

- Under normal operation of the mains supply, the leakage current protection circuit breaker installed at the input end will activate, because the output circuit is not isolated from the input circuit.
- In battery operation, the leakage current protection circuit breaker installed at the input end must remain closed even without voltage.

The leakage current protection circuit breaker located in the front stage of UPS must have the following characteristics:

- The allowable leakage current should be at least 300mA or above (to avoid misoperation!)
- Class A or Class B
- Delay time of at least 0.1 seconds

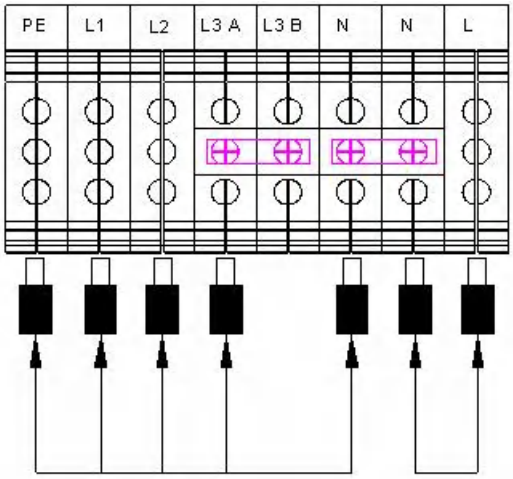
WIRING AND CONNECTIONS

When wiring, please make sure that the UPS is completely disconnected from the mains or input power and all switches are turned off!

ATTENTION! WHEN WIRING, IT IS NECESSARY TO FIRST CONNECT THE GROUND WIRE TO THE TERMINAL BLOCK (MARKED WITH "PE" ON THE TERMINAL!)
IF THERE IS NO DEFINITE GROUNDING, UPS WILL NOT BE ABLE TO OPERATE NORMALLY!

SINGLE INPUT AND LOAD WIRING

Single phase output 10-100 kVA (input: three-phase + N)

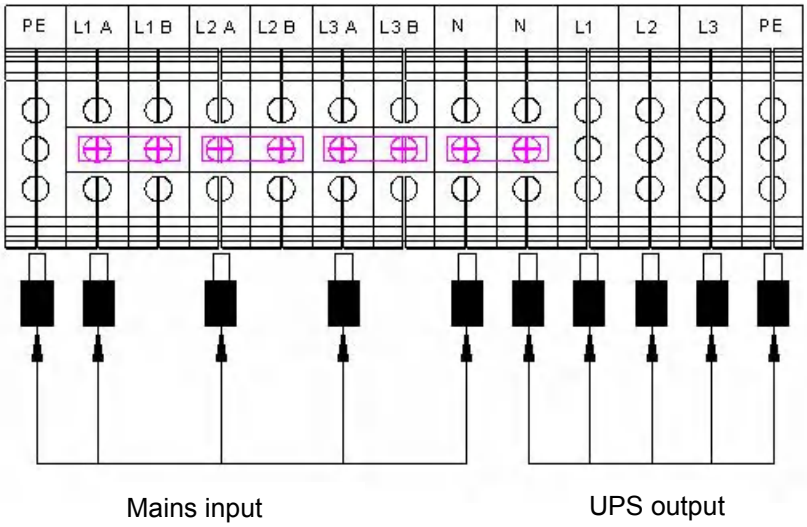


The above figure already includes the jumper position.
For input and output wire diameter size, please refer to the following table
(The table shows the maximum wire diameter):

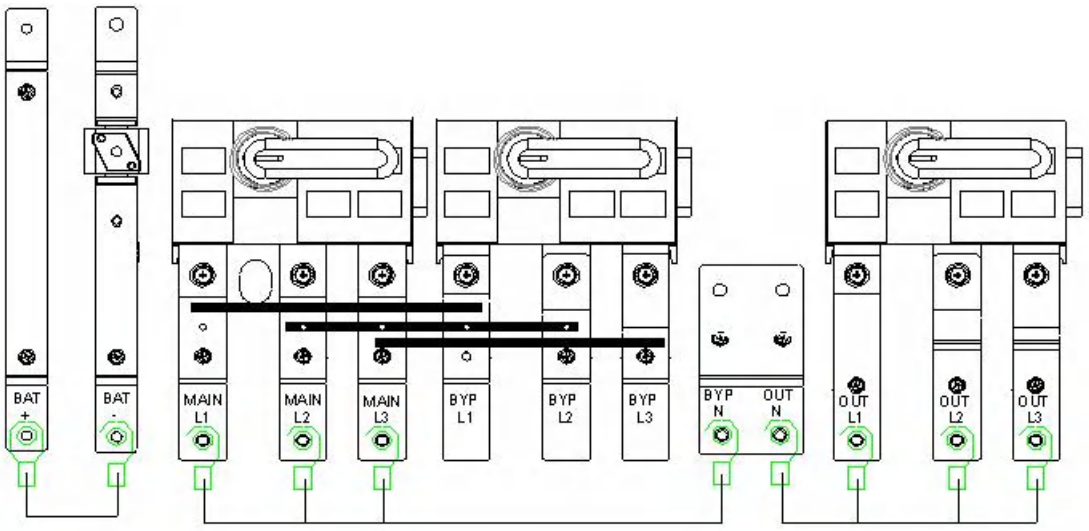
UPS type	Wire diameter size [mm square]				
	Input			Output	
kVA	L3	L1/L2	N	PE	L1/N
8	10	6	10	6	10
10	10	6	10	6	10
15	16	10	16	6	16
20	25	10	25	6	25
30	35	10	25	10	35
40	50	16	35	16	50
60	75	25	50	25	75
80	75	25	75	25	75
100	95	35	90	25	95

Three-phase output 10-400 kVA (input: three phase + N)

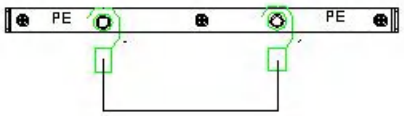
INPUT/OUTPUT terminal block wiring diagram (10-80 kVA):



INPUT/OUTPUT terminal block wiring diagram (100-400 kVA):



Battery input Main input UPS output



Input/output grounding

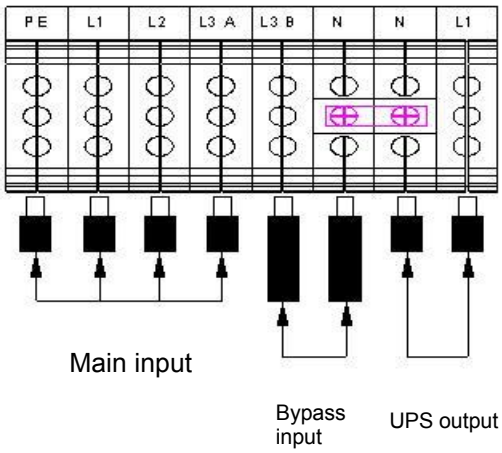
The above figure already includes the jumper position.
For input and output wire diameter size, please refer to the following table (The table shows the maximum wire diameter):

UPS type	Wire diameter [mm square]			
	Input	Output		Battery
k VA	L 1/L 2/L3/N	PE	L 1/L 2/L 3/N	+/-
10	6	6	6	10
15	6	6	6	10
20	10	10	10	16
30	16	16	16	25
40	25	16	25	35
50	25	16	25	35
60	35	16	35	50
80	35	16	35	50
100	50	25	50	70
120	50	25	50	70
160	70	25	70	95
200	70	25	70	95
250	95	25	95	120
300	120	25	120	150
350	150	25	150	185
400	185	25	185	240

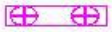
DUAL INPUT AND LOAD WIRING

Single-phase output 10-80 kVA:

INPUT/OUTPUT terminal block wiring diagram



Please remove the copper busbar L3 on the terminal block and keep the copper busbar N



Change to dual input wiring:

- Remove the jumpers L3A-L3B
- Change the mains and bypass inputs to separate inputs

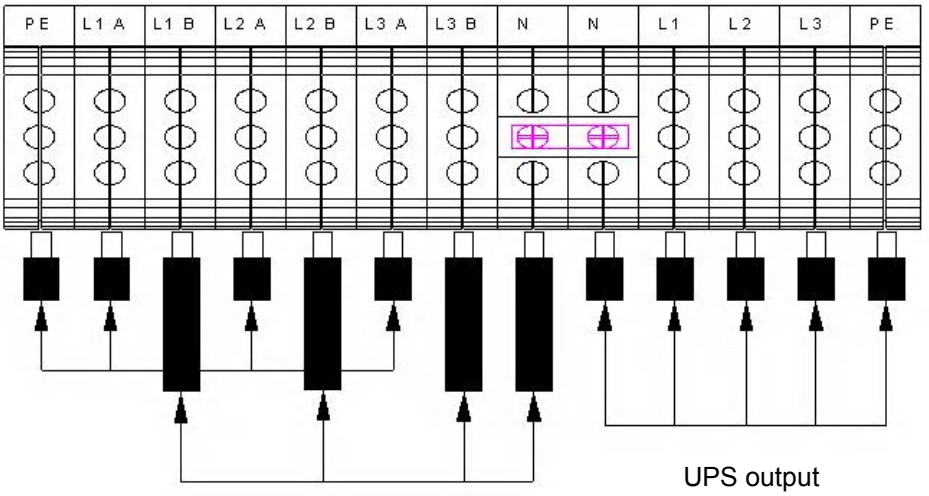
Please refer to the table below for the wire diameter size of the output and input connecting wires (The table shows the maximum wire diameter!):

UPS type	Wire diameter size [mm square]			
	Main input	Bypass input	Ground wire	Output
	L1A/L2/L3	L1B/N	PE	L1/N
10 KVA	6	10	6	10
15 KVA	10	16	10	16
20 KVA	10	25	10	25
30 KVA	10	35	10	35
40 KVA	16	50	10	50
60 KVA	25	75	16	75
80 KVA	25	75	16	75
100 KVA	35	95	16	95

Three-phase output 10-80k

INPUT/OUTPUT terminal block wiring diagram (10-80KVA):

Please remove the copper busbar L1-L3 on the terminal block and keep the copper busbar N

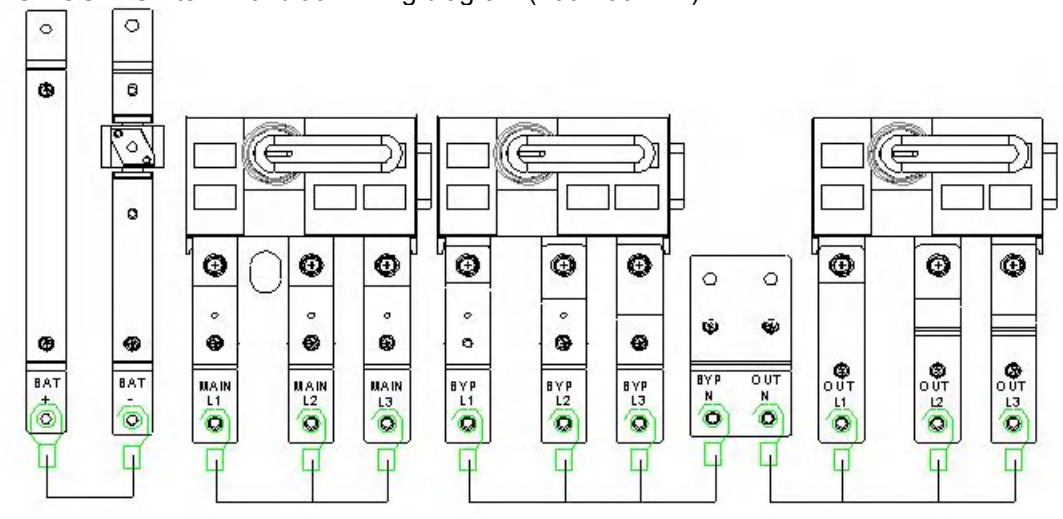


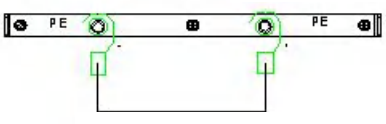
Change to dual input wiring:

- Remove the jumpers L1A-L1B, L2A-L2B, L3A-L3B
- Change the mains and bypass inputs to separate inputs

INPUT/OUTPUT terminal block wiring diagram (100-400 kVA):

Please remove the copper busbar L1-L3





INPUT/OUTPUT grounding

Change to double input wiring:

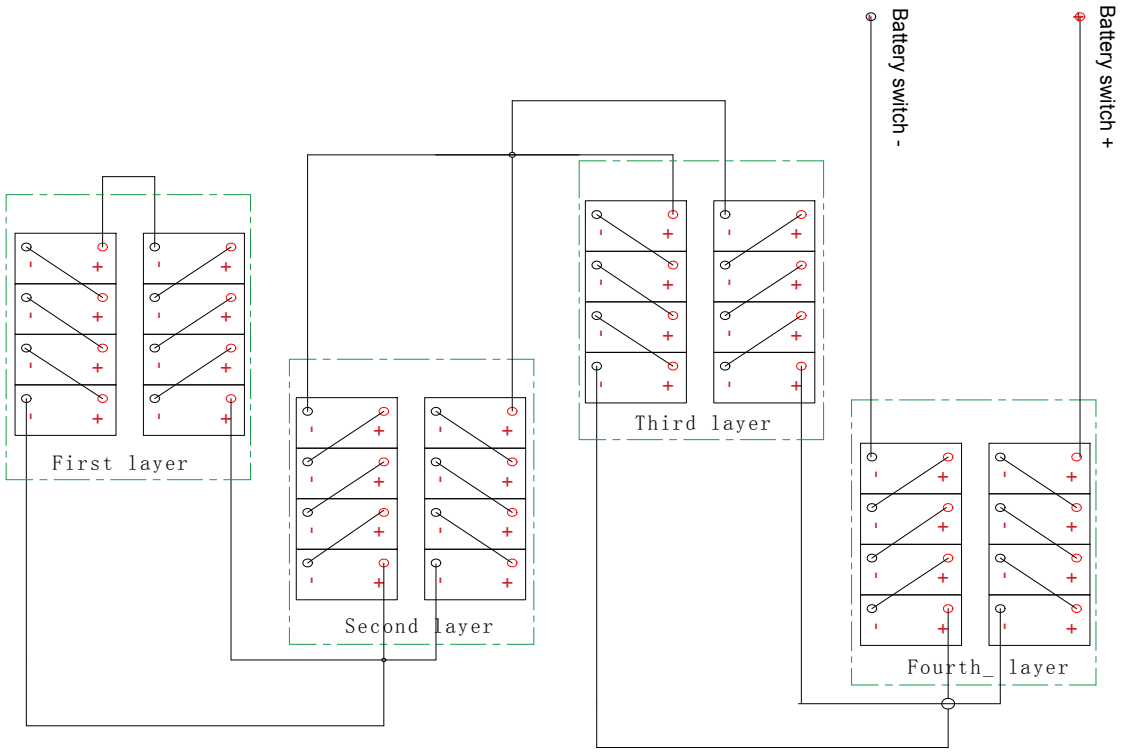
- Remove the jumpers MAIN L1- BY L1,MAIN L2- BY L2,MAIN L3- BY L3
- Change the mains and bypass inputs to separate inputs

Please refer to the table below for the wire diameter size of the output and input connecting wires (The table shows the maximum wire diameter!):

UPS type				
	Main input	Bypass input		Output
	MAIN L1-L2-L3	BY L1-L2-L3	PE	L1/L2/L3/N
10KVA	6	6	6	6
15KVA	6	6	6	6
20 KVA	10	10	10	10
30 KVA	16	16	16	16
40 KVA	25	25	16	25
50KVA	25	25	16	25
60KVA	35	35	16	35
80KVA	35	35	16	35
100KVA	50	50	25	50
120KVA	50	50	25	50
160KVA	70	70	25	70
200KVA	70	70	25	70
250KVA	95	95	25	95
300KVA	120	120	25	120
350KVA	150	150	25	150
400KVA	185	185	25	185

BATTERY CONNECTION

External battery cabinet: Please refer to the wiring diagram below for the connection of 32 batteries



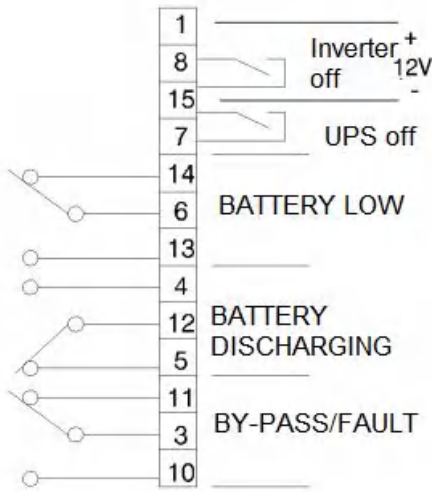
Install the external battery correctly with the appropriate wire diameter. Please refer to the following table for the wire diameter

Single phase UPS	Wire diameter size [mm square]
kVA	+/-
10	6
15	6
20	16
30	16
40	25
60	35
80	50
100	95

THREE PHASE UPS	Wire diameter size [mm square]
kVA	+/-
10	10
15	10
20	16
30	25
40	35
60	50
80	50
100	70
120	70
160	95
200	95
250	120
300	150
350	185
400	240

REMOTE CONTROL AND SIGNAL LINES

After the left door panel is opened, the communication lines between remote control and RS232 can be connected.
Two rows of connectors are located below the input fuse:
1. DB 15-pin female marked REMOTE.
2. DB 25-pin male marked RS232.



15-pin female marked REMOTE.

Nr. 1 aux power 12Vdc 80mA (max)
Nr. 3 Common contact
Nr. 2 Turning off INVERTER and UPS.
The definitions of each pin are as follows:
BATTERY LOW
BATTERY DISCHARGING
BY-PASS/FAULT

The current position shown in the figure represents the normal state (in NORMAL OPERATION).
The allowable rating of the contact is 0.5A-42V

REMOTE CONTROL
There are two functions:
Switch to BY-PASS and stop INVERTER. Connect pin 8 to pin 15 (act after 2 seconds).
Lockup UPS. Connect pin 7 to pin 15 (act after 2 seconds).

Turn off INVERTER and Switch to BY-PASS
1. If the UPS receives the STOP INVERTER command when it is in "NORMAL OPERATION" mode, it will switch to power the load by the BY-PASS (the load is not protected at this time).
2. If the UPS receives the STOP INVERTER command when it is in "EMERGENCY OPERATION" mode, it will switch itself off and stop supplying power to the load.
In both above cases, if the jumper is present, the UPS will operate in bypass mode when the mains power is restored. And If the jumper is not present, the UPS will operate in normal mode.

SYSTEM OFF
If the UPS receives the SYSTEM OFF command, it will cut off the output to the load. LOAD NOT FEED. To reactivate, press key 8 on the control panel to return to normal operation mode. When the system is completely shut down and reactivated, it will return to the operating mode before the shutdown. So it is necessary to switch to normal mode using button 8 on the control panel. To reactivate the UPS, please turn the On/Off SWBY switch once (reset).

DB9-Pin male marked RS232

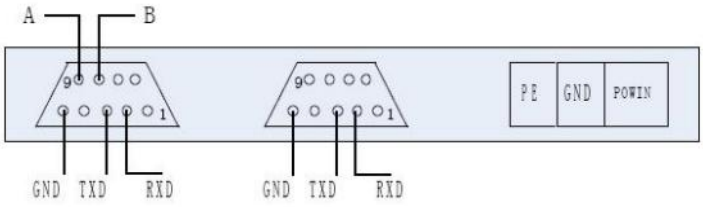
The default transmission protocol for UPS at the factory is: 9600 baud, -no parity, -8bit, -1 bit of stop
Transmission speed can be changed from 1200 to 9600 baud ((Change method is on the control panel)). Recommended transmission speeds for various distances are as follows:

9600(baud)	50m
4800	100m
2400	200m
1200	300m

Please use a communication cable with a shielded wire to connect the UPS and computer, and connect the shielded wire to the P2 terminal, wire diameter AWG22~AWG28:

UPS	Computer
P1, 9pin female	COM, 9 pin female

pin 2 to pin 2
Pin 3 to pin 3
Pin 5 to pin 5



P1 P2 P3

RS485 contact UPS
P1, 9pin female
pin 9 to A
Pin 8 to B
Pin 5 to GND

CHECKING CONNECTIONS

After connecting the input/output wiring, before covering the terminal block, please verify:

- All wiring terminals are securely screwed
- All fuse holders have a fuse inserted and are in the closed position;
- All grounding protection wires are securely screwed
- The cabinet is already grounded

START-UP PROCEDURE

After completing the electrical connection as indicated above and putting the internal panel into position, proceed to start up the UPS as follows：

- Turn on the power distribution output switch
- Turn on the battery cabinet switch (first check the polarity of the connection)
- Turn on UPS switches (There are mars on the cover)
  SWIN- input switch, SWBY- by-pass line switch, SWOUT- output switch.
  After the above operation is completed, you will hear the buzzing sound of the fan, and after 1 minute, the UPS inverter will run.

NOTE: the SWMB switch must be OFF during normal operation. The SWMB is ON only when not supplying power to the UPS, e.g. For example, during maintenance (please refer to OPERATION MODES).

OPERATIONAL CHECK

After completing the activation program and at least 4 hours later, UPS allows the battery to be charged. In normal operation mode, you can use the switches to simulate abnormal conditions. When button 5 is ON, you will immediately hear the sound of the buzzer, and the green light "OUT" and yellow light on the signal display panel will remain on Confirm that the input mains power supply of the UPS is normal, and in this case, simulate an abnormal mains power supply, the load will be powered by the energy previously accumulated in the battery. After a few minutes, you can activate the input switch to switch the UPS to normal operation mode, and the display lights "IN" and "OUT" on the control panel will continue to light up. At this point, the battery will continue to be charged

CUSTOMISATION

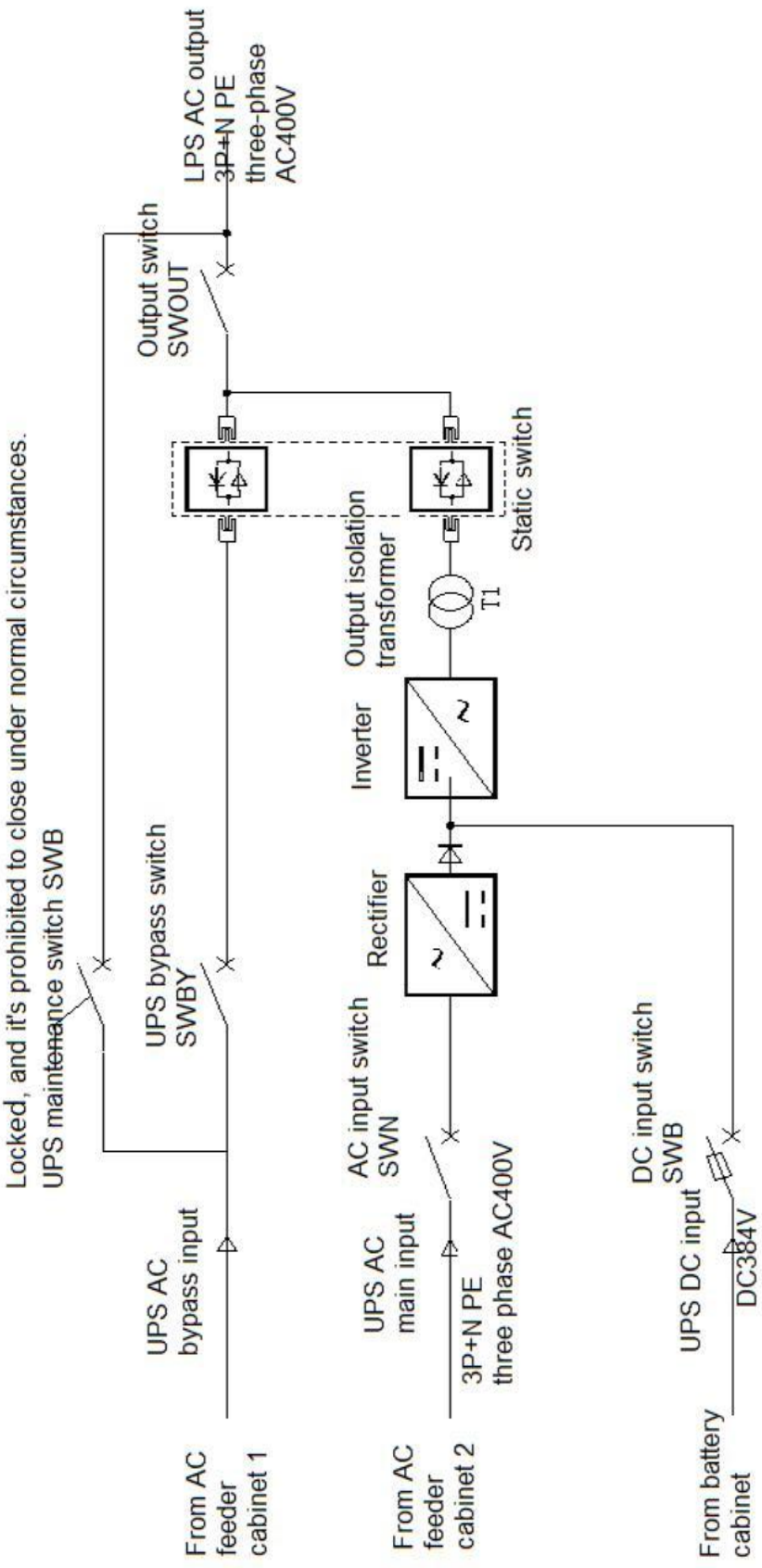
Enter authorization code 436215 on the command panel (press keys 3 "COMMANDS" and then 5 " CUSTOMISING" on the main MENU), to modify certain electrical parameters as needed:

Enter code 436215 on the maintain menue, can modify the following values：

- INVERTER OUTPUT VOLTAGE,
- Bypass input voltage and Frequency range
- Battery parameters, alarm before battery depletion
- When the output power is less than the set value, turn off the output
- Daily regular shutdown setting program and range are detailed in the description on the display panel. Check the status of the buzzer located in the bottom right corner of the display panel.

MODES OF OPERATION

BLOCK DIAGRAM



BLOCK DIAGRAM COMPONENTS

The UPS consists of the following blocks:

RECTIFIER
Converts the input AC power to DC power, The functions are the following:
- Powering the inverter with direct current.
- Charging the battery automatically. Float charge to 80% first, then equalized charge at a constant voltage.

The charging current is limited to 15% of the battery Ah value (stored in memory!) This charging current will only be executed when the total output does not exceed 110% of the rated value

EXTERNAL BATTERY
Provides the reserved energy for powering the load when there is no power input to the UPS.

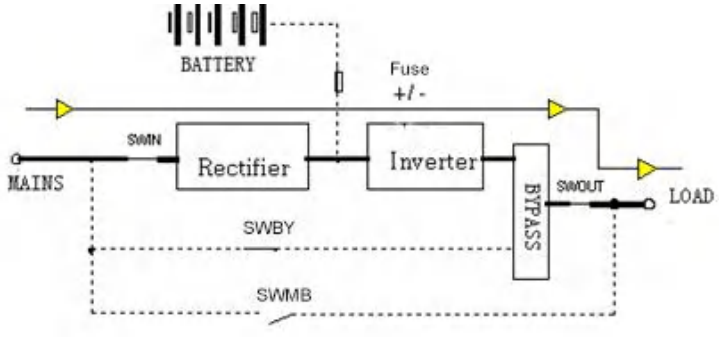
HARMONIC REDUCTION FILTER (optional)
The filter, in the front stage of rectifier, reduces harmonic distortion of input current. It consists of two inductors and several capacitors, and is protected by a fuse.

INVERTER
Converts the DC power of a rectifier or battery into AC power. It remains in working condition at all times to provide power to the load.

STATIC SWITCH
Allows to automatically or manually switch between INVERTER output and BY-PASS bypass output in real-time
At the same time, this static switch has a "Backfeed Protection" device to prevent current feedback caused by abnormal SCR faults

SWMB
Turn off the SWMB switch and turn on other switches SWIN, SWBY, or SWOUT, the UPS will be isolated for maintenance purposes. At this point, the load can still obtain power without being affected, because there is no voltage inside the UPS (The voltage only exists in the input/output terminal block and switch section. But on UPS with three-phase output, the neutral line is not separated!)

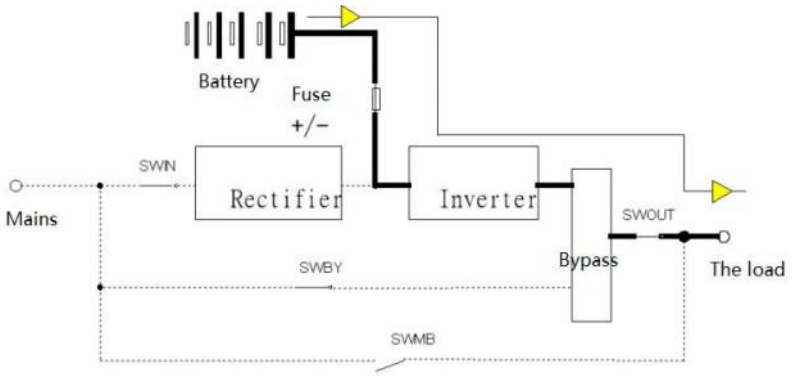
NORMAL OPERATION
MAINS is present. At this point, the switches SWIN, SWOUT, SWBY are ON, and SWMB is OFF.



Mains goes through the rectifier to the converter,
to provide the power required by the load.
At the same time, the rectifier also charges the battery.

The LED lights MAINS and OUTPUT on the control board will light up.
When the mains is interrupted, the energy stored in the battery is supplied to the load.

BATTERY OPERATION



. MAINS off, the switches SWIN, SWOUT, SWBY are ON and SWMB is OFF.

When the mains is interrupted or exceeds the allowable range (too high or too low), the load is powered by the energy conversion of the battery
At this point, the figure on the front panel will display the remaining power supply time based on the load situation and battery condition.
NOTE. The value is only an approximation.
And, unnecessary loads can be disconnected to extend the power supply time!.

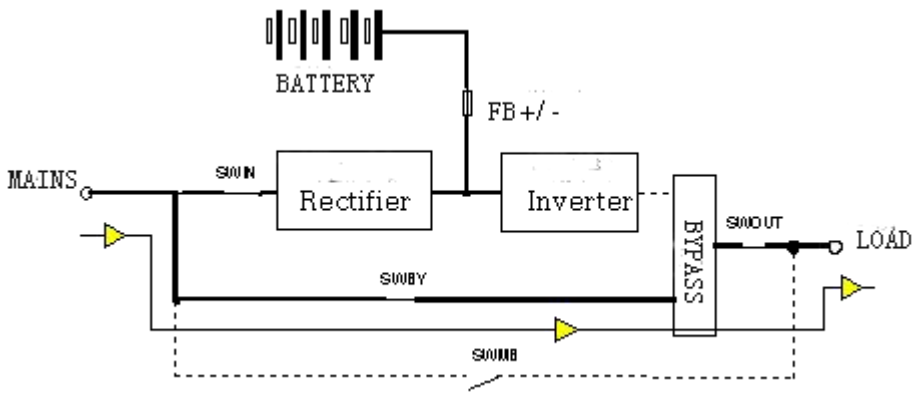
The green LED for OUTPUT remains on. When the mains is interrupted, the yellow LED for the battery will also be on, and the buzzer will intermittently alarm.
When the battery reaches the low voltage level, the alarm frequency of the buzzer will be lowered, and the yellow LED will become flashing. We suggest that you take appropriate measures as soon as possible. When the battery energy is depleted, the UPS will cut off the power supply to the load

\+ *Upon return of mains power, the UPS recharges the batteries automatically.*

BYPASS OPERATION

Human operation or malfunction causes, and the former is temporary while the latter is permanent; When the latter factor occurs, please contact the after-sales service center. If the mains power is interrupted at this time, the load is not protected by UPS

MAINS is present, and the load remains being fed. The switches SWIN, SWOUT, SWBY are ON.



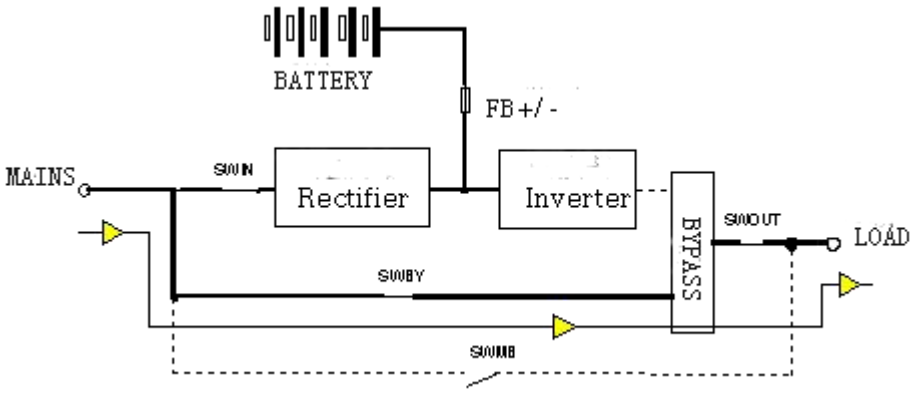
When the following situations occur:
- Automatically or manually switch to bypass mode
- Output overload (For overload situations, see the paragraph ALARM MESSAGES))
- Fault

On the control panel, the green LED for INVERTER output will be off, the yellow BYPASS LED will be on. (But if it is caused by overload or abnormal conditions, it will flash.)
When switching to bypass mode under overload, the load must be reduced, otherwise the circuit breaker in the bypass line may trip and cut off the power supply to the load (refer to the "SPECIFICATIONS" section)

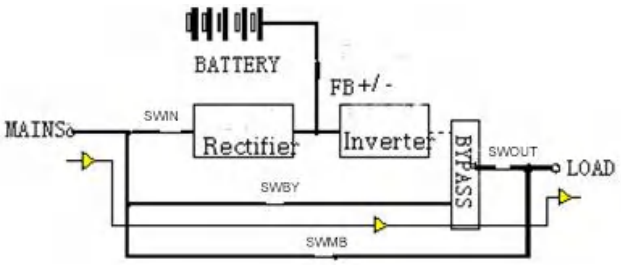
MANUAL BYPASS MAINTENANCE SWMB

With the manual bypass maintenance switch SWMB, it is possible to continue to supply power to the load while maintenance work is being carried out. Follow the steps below:

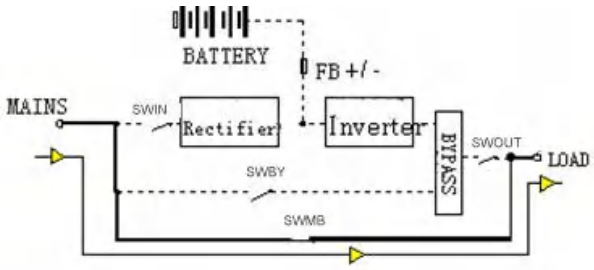
Status I
Normal mode



Status II
Turn off the inverter and turn on the switch SWMB (The control circuit will automatically cut off the inverter).



Status III
All switches are off, and only the SWMB switch is kept ON (by-pass maintenance line).
At this point, the load is powered by a manual bypass line, and any mains interference will directly affect the load equipmen.



When maintenance operations are concluded, reactivate the UPS:
Turn on SWIN, SWBY, SWOUT, and then turn off SWMB, The UPS will return to normal operating mode.

MAINTENANCE

CAUTION !
Maintenance inside the UPS should only be done by qualified personnel. Because even if the switches for the mains and battery open, there may still be dangerous voltage inside the UPS. Removal of the side panels of the UPS by unqualified personnel can cause harm to the operator and damage the equipment.

Regular Preventive Maintenance
The components that require daily maintenance and inspection in the UPS are fans and batteries:

- Fan Regular checks are required to ensure proper operation
- Battery. (CAUTION!) Any battery replacement should be done by qualified personnel. Abandoned batteries must be handed over to qualified professional recycling manufacturers for appropriate disposal. Battery is classified as 'toxic waste' by law. The UPS automatically checks battery efficiency every 24 hours and gives an alarm when it finds the efficiency too low. Battery life depends on the operating temperature and the number of charges and discharges. When the battery is at 20 ° C, its lifespan is approximately 3 to 5 years, while at 30 ° C, its lifespan is halved. The capacity of a battery is not fixed, and it will slightly increase after a few charges and discharges during initial use, and then decay after maintaining a fixed capacity for hundreds of cycles.

Battery maintenance should include:
- Maintain the operating temperature within the range 20-25°C.
- Carry out two or three charge/discharge cycles during the first month of use .
- Then perform charging and discharging operation every 6 months.

SPECIFICATIONS

SINGLE-PHASE OUTPUT UPS

Model	10KVA	15KVA	20KVA	30KVA	40KVA	60KVA	80KVA	100KVA
Capacity	10KVA	15KVA	20KVA	30KVA	40KVA	60KVA	80KVA	100KVA
System parameters								
Relationship between output power factor cosφ and the load								
0.5~0.8 inductive load	100%							
0.8~1.0 inductive load	100~80%							
1.0 linear Load	80%							
0.8~1.0 capacitive load	80%							
0.5~0.8 capacitive load	70%							
Computer load	80%							
Overall efficiency (normal mode)	92%							
50% load	90%							
Overall efficiency (economic model):100% load	98%							
Max. leakage current（mA）	100							
Standby economy mode	Standard function							
Mean time between failure （MTBF）	200,000hours							
Computer monitoring interface	Standard configuration RS232, RS485 / MODBUS							
Operating temperature	0 ~ 40 °C							
Max relative humidity	95 % (non-condensing)							
Cooling	Forced ventilation (fan speed varies with load and temperature)							
Maximum altitude	Rated power at 1000m (Reduce by -1% for every 100 meters rise), maximum 4000m							
Noise dB	52 ~62							
Protection class（EN 60529）	IP20							
Incoming and outgoing line	Incoming from bottom							
Safety standard	Safety regulations：GB4943, EN 50091-1； EMC: GB7260.2，GB/T 17626.2~5EMC， EN 50091-2							
Physical parameters								
Width (mm)	540				550			800
Depth * Height (mm)	657*1132				725*1290			Customized
Weight (Kg)	173	199	211	276	329	415	419	665
Rectifier input								
Rated voltage	380/400/415VAC Three phase three wire							
Voltage range	± 15 % （± 25 % adjustable）							
Rated frequency	50 / 60 Hz(Automatic identification)							
Rated frequency	45 ~ 65							
Input power pre-charge function	Yes, 0-100%, can be set in 10-300 seconds							
Input power factor cosφ：	Up to 0.99 (with harmonic filter)							
Input current harmonic	Minimum<5% (with harmonic filter)							
Max. input current [A]	18	27	36	55	72	108	130	180

Rectifier output								
Maintenance voltage (20°C)	Battery type 1 and 2：V = (2.266 * el.) Vdc							
	Battery type 3：V = (2.21 * el.) Vdc							
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]							
Charging Voltage (20°C)	Battery type 1 and 2：V(% Recharging<95%)= (2.32 * el.) Vdc							
	Battery type 3：V(% Recharging<95%)= (2.4 * el.) Vdc							
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]							
Max. charging voltage	(2.32 * el.) Vdc							
Charger output voltage stabilization accuracy	1%							
DC ripple voltage component	≤1%							
Battery								
Number of units (rated voltage)	174 units（348VDC）~240 units（480VDC）							
Charging current setting	0.1A x C10							
Battery discharge termination voltage	Battery1, 2 and 3：No-load discharge current, Vmin=(1.81 * el.) [Vdc]							
	Battery1, 2 and3：output current=Ah Capacity, Vmin=(1.65 * el.) [Vdc]							
	Battery 1, 2 and3：output current>Ah Capacity, Vmin=(1.60 * el.) [Vdc]							
	Battery 0 type： Factory default values, Vmin=(1.67 * el.) [Vdc] Adjustment range Vmin =(1.57~1.88) * el. [Vdc]							
Single-phase inverter output								
Rated capacity [KVA]	10	20	30	40	50	60	80	100
Rated power [KW]	8	16	24	32	40	48	64	80
Rated voltage [V]	220/230VAC							
Rated current [A]	29	72	109	145	182	218	290	364
Phase voltage setting	200 ~ 244 V (control panel)							
Peak factor（peak/Irms）	3：1							
Wave form	Sine wave							
Voltage phase shift (degrees) 100% balanced load	± 1'							
Voltage phase shift (degrees) 100% unbalanced load	± 2'							
Phase voltage difference 100% balanced load	± 1 %							
Phase voltage difference 100% unbalanced load	± 3 %							
Total harmonic distortion（THDv） 100% linear Load	<2%							
Total harmonic distortion（THDv） 100% non-linear Load	<5%							
Steady voltage stability	± 1 %							
Transient voltage response	± 5 % within 10ms							
Rated frequency	Same as input							
Frequency stability	± 0.5% when asynchronous; During synchronization, ± 2% (can be set to ± 1-5%, operated by the panel)							
Overload	600’ / 10’ / 1’ （110/125/150% Rated current）							

Short circuit for 0.1 seconds	2 times input

Inverter efficiency	96%							
Single-phase bypass input								
Rated capacity [KVA]	10	20	30	40	50	60	80	100
Rated voltage [V]	220/230VAC							
Input voltage range	±15 %（Can be adjusted from the control panel to ± 10 %，± 20%）							
Rated frequency [Hz]	50 / 60							
Voltage range	±2 %（Can be adjusted from the control panel to ± 5 %）							
“STAND-BY ON”（Switching time from bypass to inverter in economic mode)	2~5ms							
Inverter/bypass switchover time	<1ms							
Overload capacity	10’/1’/18” （150/175/200% Rated current）							
Standard configuration	Feed current protection; Bypass can be independently separated							

THREE-PHASE OUTPUT UPS

UPS 10-80KVA

Model	10KVA	15KVA	20KVA	30KVA	40KVA	60KVA	80KVA
Capacity	10KVA	15KVA	20KVA	30KVA	40KVA	60KVA	80KVA
System parameters							
Relationship between output power factor cosφ and the load							
0.5~0.8 inductive load	100%						
0.8~1.0 inductive load	100~80%						
1.0 linear Load	80%						
0.8~1.0 capacitive load	80%						
0.5~0.8 capacitive load	70%						
Computer load	80%						
Overall efficiency (normal mode) Load 100%	92%						
50% load	90%						
Overall efficiency (economic model):	98%						
Max leakage current（mA）	100						
Standby economy mode	Standard function						
Mean time between failures	200,000 hours						
Computer monitoring port	Standard configuration RS232， RS485 / MODBUS						
Operating temperature	0 ~ 40 °C						
Max relative humidity	95 % (non-condensing)						
Cooling	Forced ventilation (fan speed varies with load and temperature)						
Maximum altitude	Rated power at 1000m (increase by 100m and decrease by -1%), maximum 4000m						
Noise dB	52 ~ 58						
Protection class（EN 60529）	IP20						
Incoming and outgoing line	Bottom/Back						
Safety standard	\Safety regulations： GB4943 ，EN 50091-1； EMC： GB7260.2， GB/T 17626.2~5EMC， EN 50091-2						
Physical parameters							
Width (mm) W	540					550	
Depth * Height (mm)	657*1132					725*1290	
Weight (Kg)	173	199	211	254	306	429	515
Rectifier input							
Rated voltage	380/400/415VACThree phase three wire						
Voltage range	± 15 % （± 25 % adjustable）						
Rated frequency	50 / 60 Hz						
Frequency range	45 ~ 65						
Input power soft start function	Yes, 0-100%,10-300 seconds settable						
Input power factor cosφ	Up to 0.99 (with harmonic filter)						
Input current harmonic component	Minimum<5% (with harmonic filter)						
Max. input current [A]	18	27	36	54	72	108	144

Rectifier output							
Maintenance voltage (20°C)	Battery type1 and 2 ： V = (2.266 * el.) Vdc						
	Battery type 3 ： V = (2.21 * el.) Vdc						
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]						
Charging Voltage (20°C)	Battery type1 and 2 ： V(%Recharging<95%)= (2.32 * el.) Vdc						
	Battery type 3 ： V(%Recharging<95%)= (2.4 * el.) Vdc						
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]						
Max charging Voltage	(2.32 * el.) Vdc						
Charger output voltage stabilization accuracy	1%						
DC ripple voltage component	≤1%						
Battery							
Number of units (rated voltage)	174 unit（348VDC）~240 unit（480VDC）						
Charging current setting	0.1A x C10						
Battery discharge termination voltage	Battery1, 2 and3：No-load discharge current，Vmin=(1.81 * el.) [Vdc]						
	Battery1, 2 and3：output current=Ah Capacity，Vmin=(1.65 * el.) [Vdc]						
	Battery1, 2 and3：output current>Ah Capacity，Vmin=(1.60 * el.) [Vdc]						
	Battery 0 type： Factory default values ，Vmin=(1.67 * el.) [Vdc] Adjustment range Vmin =(1.57~1.88)*el. [Vdc]						
Three-phase inverter output							
Rated capacity [KVA]	10	15	20	30	40	60	80
Rated power[KW]	8	12	16	24	32	48	64
Rated voltage [V]	380/400/415VAC Three-phase four-wire						
Rated current [A]	12	18	24	36	48	72	96
Phase voltage setting	200 ~ 244 V (control panel)						
Peak factor（Ipeak/Irms）	3：1						
Wave form	Sine wave						
Voltage phase shift (degrees) 100% balanced load	± 1'						
Voltage phase shift (degrees) 100% unbalanced load	± 2'						
Phase voltage difference 100% balanced load	± 1 %						
Phase voltage difference 100% unbalanced load	± 3 %						
Total harmonic content（THDv） 100%linear Load	<2%						
Total harmonic content（THDv） 100% non-linear Load	<5%						
Steady voltage stability	± 1 %						
Transient voltage response	± 5 % within 10ms						
Rated frequency	same as input						
Frequency stability	± 0.5% when asynchronous; During synchronization, ± 2% (can be set to ± 1-5%, operated by the panel)						
Overload	600’ / 10’ / 1’ （110/125/150% Rated current ）						

Short circuit for 0.1 seconds	2 times input						
Inverter efficiency（100% load)	96%						
Three phase bypass input							
Rated capacity [KVA]	10	15	20	30	40	60	80
Rated voltage [V]	380/400/415VAC Three-phase four-wire						
Input voltage range	±15 %（Can be adjusted from the control panel to± 10 %，± 20%）						
Rated frequency [Hz]	50 / 60						
Voltage range	±2 %（Can be adjusted from the control panel to± 5 %）						
“STAND-BY ON”（Switching time from bypass to inverter in economic mode)	2~5ms						
Inverter/bypass switchover time	<1ms						
Overload capacity	10’/1’/18”（150/175/200% Rated current）						
Standard configuration	Feed current protection; Bypass can be independently separated						

UPS100-200KVA

Model	100KVA	120KVA	160KVA	200KVA
Capacity	100KVA	120KVA	160KVA	200KVA
System parameters				
Relationship between output power factor cosφ and the load				
0.5~0.8 inductive load	100%			
0.8~1.0 inductive load	100~80%			
1.0 linear Load	80%			
0.8~1.0 capacitive load	80%			
0.5~0.8 capacitive load	70%			
Computer load	80%			
Overall efficiency (normal mode)100% load	94%			
50% load	92%			
Overall efficiency (economic model): 100% load	98%			
Max leakage current（mA）	100			
Standby economy mode	Standard function			
Mean time between failures（MTBF）:	200,000hours			
Computer monitoring port	Standard configuration RS232，RS485 / MODBUS			
Operating temperature	0 ~ 40 °C			
Max relative humidity	95 % (non-condensing)			
Cooling	Forced ventilation (fan speed varies with load and temperature)			
Maximum altitude	Rated power at 1000m (increase by 100m and decrease by -1%), maximum 4000m			
Noise dB	55~ 60			
Protection class（EN 60529）	IP20			
Incoming and outgoing line method	Bottom incoming line			
Safety standard	Safety regulations：GB4943 ，EN 50091-1；EMC：GB7260.2，GB/T 17626.2~5EMC，EN 50091-2			
Physical parameters				
Width (mm)	800		800	
Depth * Height (mm)	745*1700		850*1900	
Weight (Kg)	665	675	805	900
Rectifier input				
Rated voltage	380/400/415VAC Three phase three wire			
Voltage range	± 15 % （± 25 % adjustable）			
Rated frequency	50 / 60 Hz			
Voltage range	45 ~ 65			
Input power soft start function	Yes, 0-100%, can be set in 10-300 seconds			
Input power factor cosφ：	Up to 0.99 (with harmonic filter)			
Input current harmonic component（THD I ）	Minimum <5% (with harmonic filter)			
Max. input current [A]	180	216	288	360

Rectifier output				
Maintenance voltage (20°C)	Battery type1 and 2 ： V = (2.266 * el.) Vdc			
	Battery type 3 ： V = (2.21 * el.) Vdc			
	Battery type 0： The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]			
Charging Voltage (20°C)	Battery type1 and 2 ： V(% Recharging<95%)= (2.32 * el.) Vdc			
	Battery type 3 ： V(% Recharging<95%)= (2.4 * el.) Vdc			
	Battery type 0： The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]			
Max. charging voltage	(2.32 * el.) Vdc			
Charger output voltage stabilization accuracy	1%			
DC ripple voltage component	≤1%			
Battery				
Number of units (rated voltage)	174 unit（348VDC）~240 unit（480VDC）			
Charging current setting	0.1A x C10			
Battery discharge termination voltage	Battery1，2 and3：No-load discharge current，Vmin=(1.81 * el.) [Vdc]			
	Battery1，2 and3：output current=Ah Capacity，Vmin=(1.65 * el.) [Vdc]			
	Battery1，2 and3：output current>Ah Capacity，Vmin=(1.60 * el.) [Vdc]			
	Battery 0 type： Factory default values ，Vmin=(1.67 * el.) [Vdc] Adjustment range Vmin =(1.57~1.88) *			
Three-phase inverter output				
Rated capacity [KVA]	100	120	160	200
Rated power [KW]	80	96	128	160
Rated voltage [V]	380/400/415VAC Three-phase four-wire			
Rated current [A]	120	144	192	240
Phase voltage setting	200 ~ 244 V (control panel)			
Peak factor（Ipeak/Irms）	3：1			
Wave form	Sine wave			
Voltage phase shift (degrees) 100% balanced load	± 1'			
Voltage phase shift (degrees) 100% unbalanced load	± 2'			
Phase voltage difference 100% balanced load	± 1 %			
Phase voltage difference 100% unbalanced load	± 3 %			
Total harmonic content（THDv） 100%linear Load	<2%			
Total harmonic content（THDv） 100% non-linear Load	<5%			
Steady voltage stability	± 1 %			
Transient voltage response	± 5 % within 10ms			
Rated frequency	same as input			
Frequency stability	± 0.5% when asynchronous; During synchronization, ± 2% (can be set to ± 1-5%, operated by the panel)			
Overload	600’ / 10’ / 1’ （110/125/150% Rated current ）			

Short circuit for 0.1 seconds	2 times input			
Inverter efficiency （100% load）	96%			
Three phase bypass input				
Rated capacity [kVA]	100	120	160	200
Rated voltage [V]	380/400/415VAC Three-phase four-wire			
Input voltage range	±15 %（Can be adjusted from the control panel to± 10 %，± 20%）			
Rated frequency [Hz]	50 / 60			
Voltage range	±2 %（Can be adjusted from the control panel to± 5 %）			
“STAND-BY ON”（Switching time from bypass to inverter in economic mode	2~5ms			
Inverter/bypass switchover	<1ms			
Overload capacity	10’/1’/18”（150/175/200% Rated current）			
Standard configuration	Feed current protection; Bypass can be independently separated			

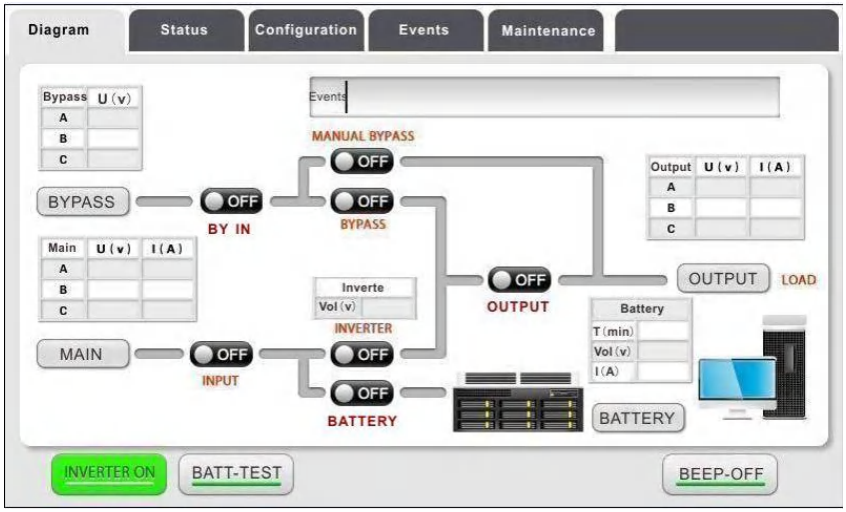
UPS 250-400KVA

Model	250KVA		300KVA		350KVA		400KVA	
Capacity	250KVA		300KVA		350KVA		400KVA	
	6 pulse	12 pulse	6 pulse	12 pulse	6 pulse	12 pulse	6 pulse	12 pulse
System								
Relationship between output power factor cos φ and the load								
0.5~0.8 inductive load	100%							
0.8~1.0 inductive load	100~80%							
1.0 linear Load	80%							
0.8~1.0 capacitive load	80%							
0.5~0.8 capacitive load	70%							
Computer load	80%							
Overall efficiency (normal mode) 100% load	94%							
50% load	92%							
Overall efficiency (economic model):100% load	98%							
Max leakage current（mA）	100							
Standby economy mode	Standard function							
Mean time between failures（MTBF）	200,000 hours							
Dry contact signal	Optional 14 contact signals; Output 12Vdc 80mA							
Computer monitoring port	Standard configuration RS232, RS485 / MODBUS							
Operating temperature	0 ~ 40 °C							
Max relative humidity	95 % (non-condensing)							
Cooling	Forced ventilation (fan speed varies with load)							
Maximum altitude	Rated power at 1000m (increase by 100m and decrease by -1%), maximum 4000m							
Noise dB	54 ~ 62							
Protection class（EN 60529）	IP20							
Incoming and outgoing line method	Bottom/Back							
Safety standard	Safety regulations：GB4943，EN 50091-1；EMC：GB7260.2，GB/T 17626.2~5EMC，EN 50091							
Physical parameters								
Width (mm)	1205							
Depth * Height (mm)	850*1900							
Weight(Kg)	1080	1220	1200	1440	1200	1570	1300	1720
Rectifier input characteristics								
Rated voltage	380/400/415VAC Three phase three wire							
Voltage range	± 15 % （± 25 % adjustable）							
Rated frequency	50 / 60 Hz Automatic identification							
Voltage range	45 ~ 65							
Input power soft start function	Yes, 0-100%, can be set in 10-300 seconds							
Input power factor cosφ	Up to 0.99 (with harmonic filter)							

Input current harmonic	< 5% (when adding a harmonic filter)			
Max. input current [A]	400	500	550	630
Rectifier output characteristics				
Maintenance voltage (20°C)	Battery type 1 and 2：V = (2.266 * el.) Vdc			
	Battery type 3 ： V = (2.21 * el.) Vdc			
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]			
Charging Voltage (20°C)	Battery type1 and 2：V (%Recharging<95%)= (2.32 * el.) Vdc			
	Battery type 3：V (%Recharging<95%)= (2.4 * el.) Vdc			
	Battery type 0：The voltage value is between type 1 and 2, and the voltage value adjustment range V =(2.09~2.4) * el. [Vdc]			
Max. charging Voltage	(2.32 * el.) Vdc			
Charger output voltage stabilization accuracy	1%			
DC ripple voltage component	≤1%			
Battery				
Number of units (rated voltage)	192 unit（384VDC）~240 unit（480VDC）			
Charging current setting	0.1A x C10			
Battery discharge termination voltage	Battery1, 2 and3：No-load discharge current，Vmin=(1.81 * el.) [Vdc]			
	Battery1, 2 and3：output current=Ah Capacity，Vmin=(1.65 * el.) [Vdc]			
	Battery1, 2 and3：output current>Ah Capacity，Vmin=(1.60 * el.) [Vdc]			
	Battery 0 ： Factory default values ，Vmin=(1.67 * el.) [Vdc] Adjustment range Vmin =(1.57~1.88) * el. [Vdc]			
Inverter output				
Rated capacity [KVA]	250	300	350	400
Rated power [KW]	200	240	280	320
Rated voltage[V]	380/400/415VAC Three-phase four-wire			
Rated current [A]	304	365	426	486
Phase voltage setting	200 ~ 244 V (control panel)			
Peak factor（Ipeak/Irms）	3：1			
Wave form	Sine wave			
Voltage phase shift (degrees) 100% balanced load	± 1'			
Voltage phase shift (degrees) 100% unbalanced load	± 2'			
Phase voltage difference 100% balanced load	± 1 %			
Phase voltage difference 100% unbalanced load	± 3 %			
Total harmonic content（THDv） 100% linear Load	<2%			

Total harmonic content（THDv）100% non-linear Load	<5%			
Steady voltage stability	± 1 %			
Transient voltage response	± 5 % within 10ms			
Rated frequency	same as input			
Frequency stability	± 0.5% when asynchronous; During synchronization, ± 2% (can be set to ± 1~5%, operated by the panel)			
Overload	600’ / 10’ / 1’ （110/125/150% Rated current ）			
Short circuit for 0.1 seconds	2 times input			
Inverter efficiency (100% load）	98%			
Bypass				
Rated capacity [KVA]	250	300	350	400
Rated voltage [V]	380/400/415VAC Three-phase four-wire			
Input voltage range	±15 %（Can be adjusted from the control panel to± 10 %，± 20%）			
Rated frequency [Hz]	50 / 60			
Voltage range	±2 %（Can be adjusted from the control panel to± 5 %）			
“STAND-BY ON”（Switching time from Bypass to inverter in economic mode	2~5ms			
Inverter/bypass switchover time	<1ms			
Overload capacity	10’/1’/18”（150/175/200% Rated current）			
Standard configuration	Feed current protection; Bypass can be independently separated			

HUMAN-MACHINE TOUCH SCREEN CONTROL PANEL



CONTROL PANEL

Control panel consists of LED status indicators and a 7-inch touch screen.

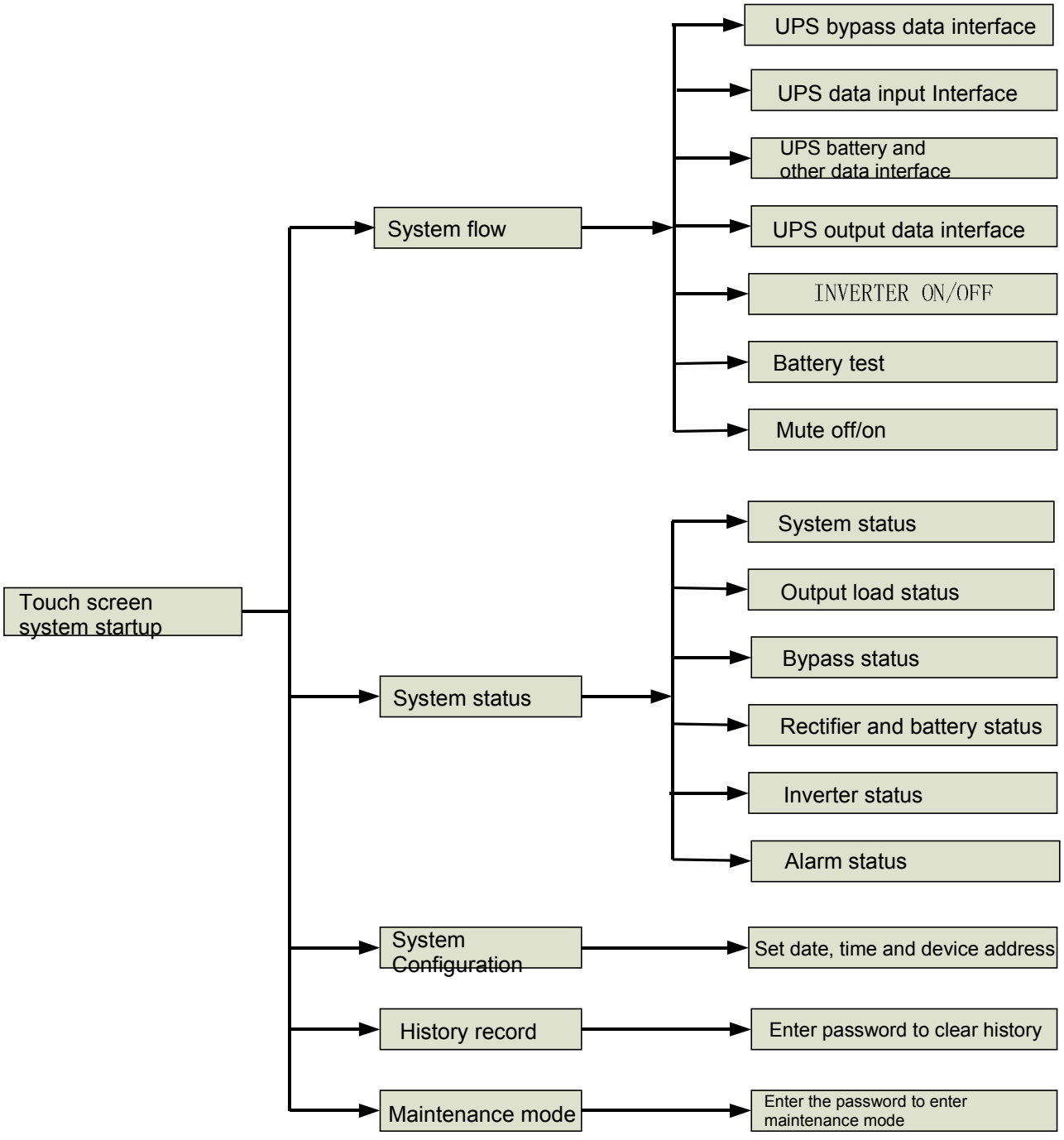
Status indicators:

The LED indicators on the control panel provides quick information, and the LED light may be constantly on, flashing, or off in different states. There are 5 LED indicators on the panel:
"Input" (green): Main input power status indicator;
"By In" (green): Bypass input power status indicator,
"Bypass" (yellow): Bypass operating mode indicator,
"INV" (green): Inverter operating mode indicator,
"Battery" (yellow) : Battery indicator.

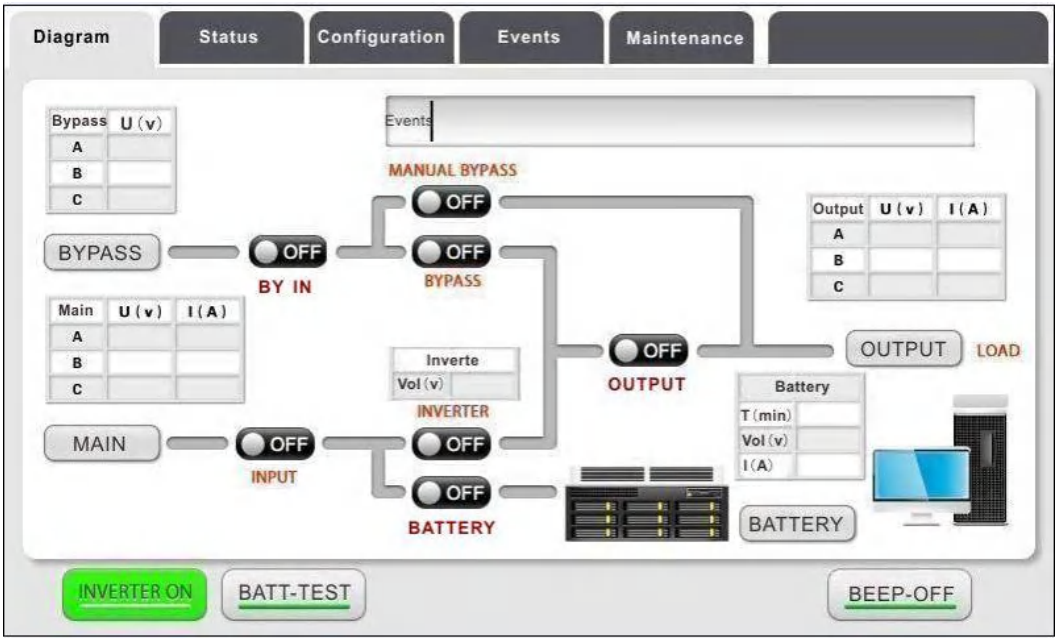
The working status of LED light on the panel is as follows.

LED light / Working status	Input	By In	Bypass	INV	Battery
Light on	Main input power is normal	Bypass input is normal	Bypass mode	Inverter mode	Battery mode
Flashing	No	Bypass input power phase sequence is abnormal	Maintenance mode, bypass output is overloaded	Inverter output is overloaded, low battery	Abnormal battery capacity or battery low voltage
Lligh off	Main input power voltage and frequency are abnormal	Bypass input power voltage and frequency are abnormal	Non-bypass mode	Non-inverter mode	Battery is normal

FLOW CHART OF HUMAN-MACHINE TOUCH SCREEN CONTROL INTERFACE

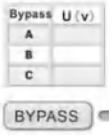


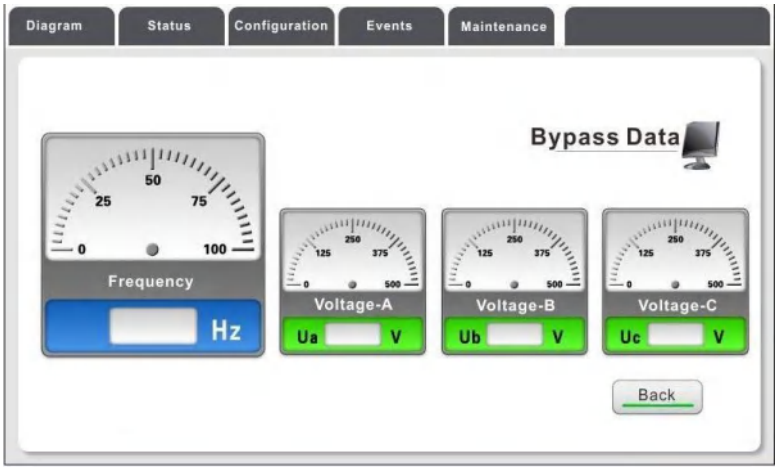
1. System process interface (three buttons below, turn on/off inverter, battery test, turn on/off mute).



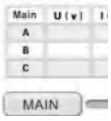
Click the inverter on button "INVERTER ON" or the inverter off button "INVERTER OFF", the password input window will pop up, enter the password "000000", click "ENTER" to confirm, turn on or off the inverter.

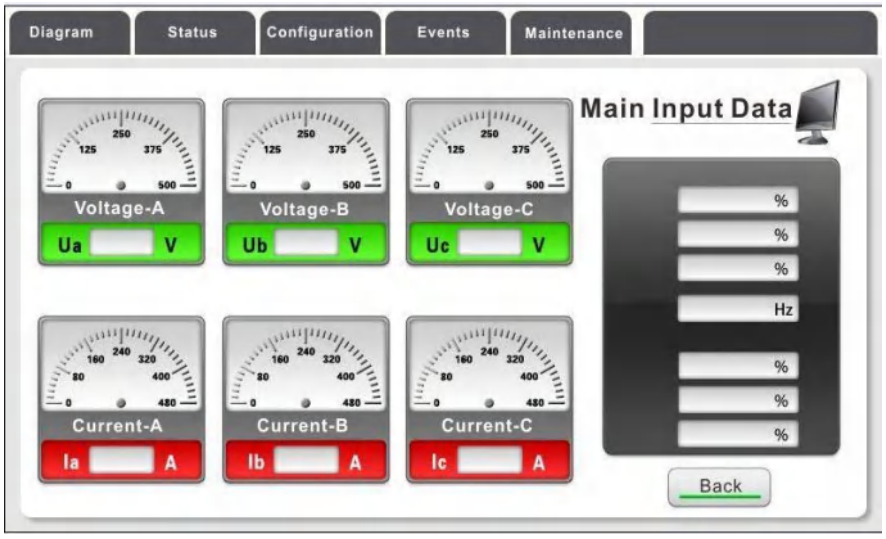
2. UPS bypass data interface (click “bypass input” or bypass input form on “system flow interface to enter).



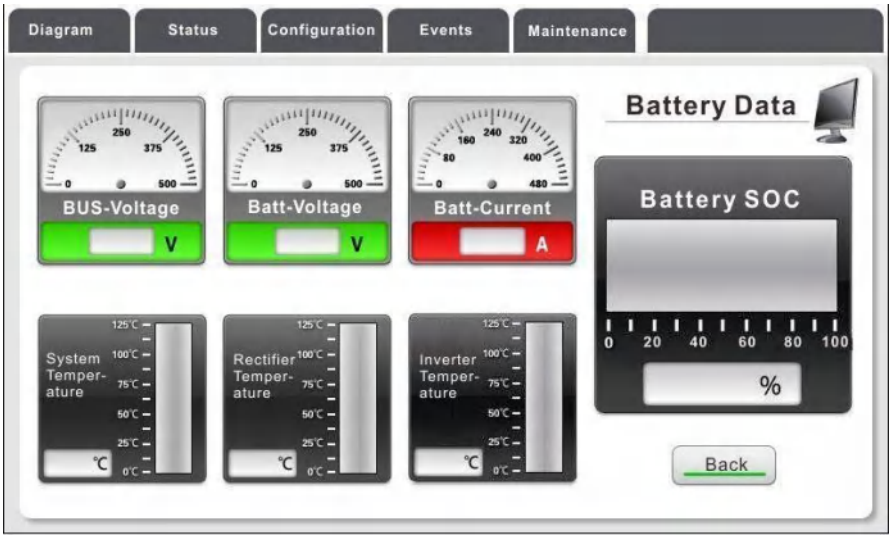


3. UPS input data interface (click“Mains input” or the mains input form on “System flow interface” to enter).

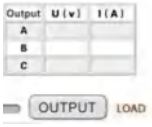


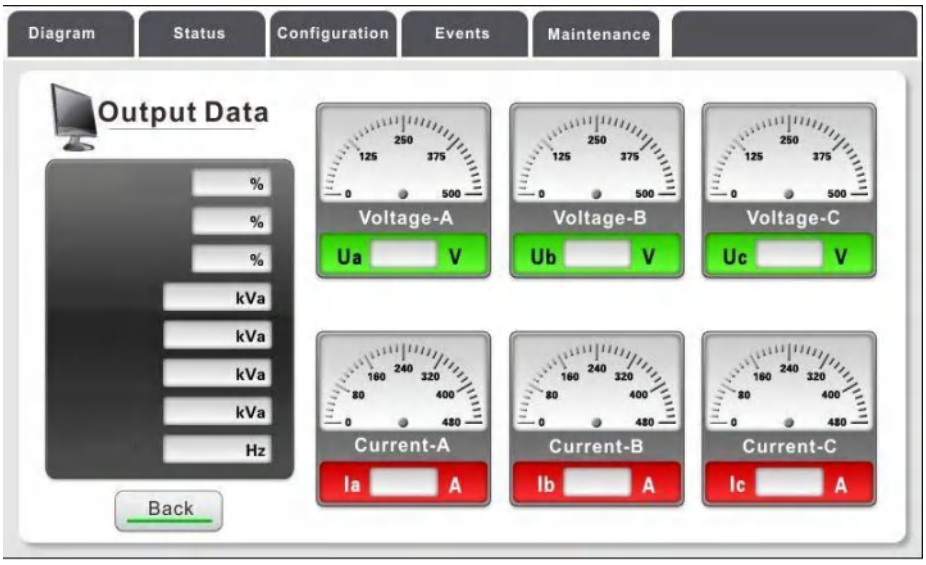


4. UPS battery and other data interface (click “Battery” or battery form on “System flow interface” to enter).

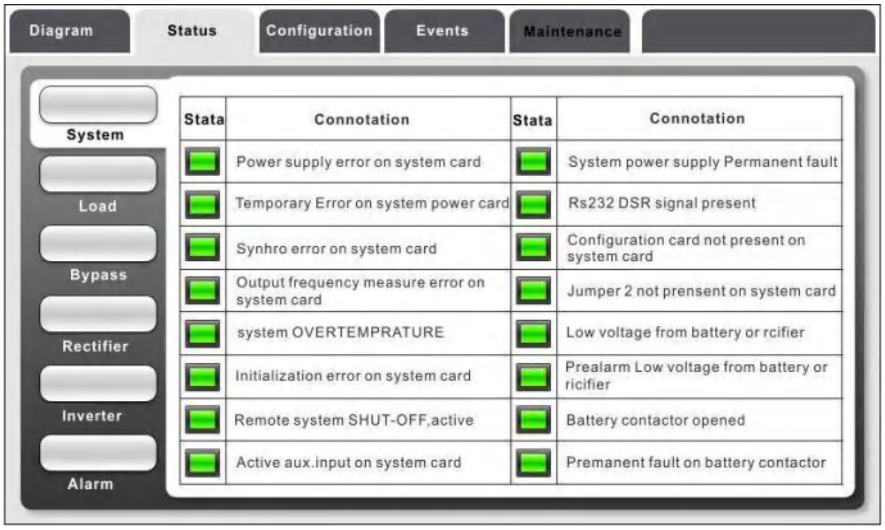


5. UPS output data interface (click “output” or output form on “system process interface” to enter).

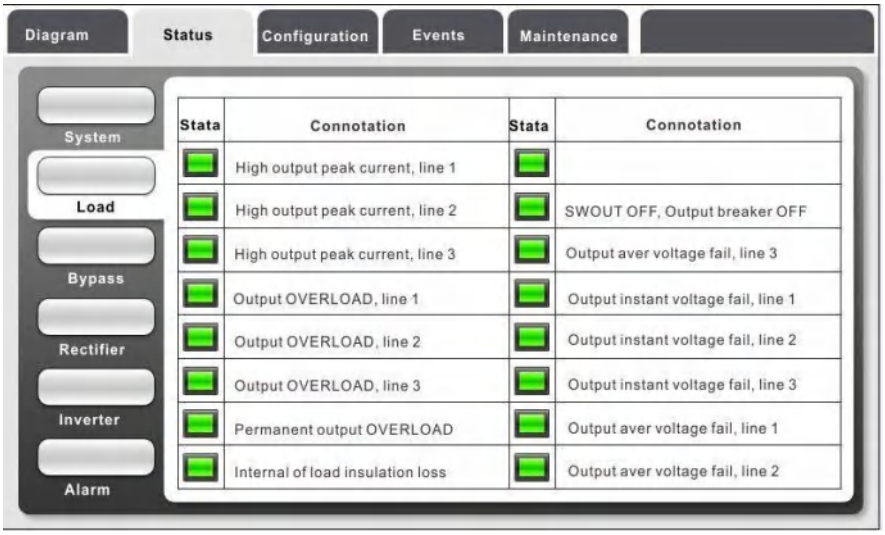




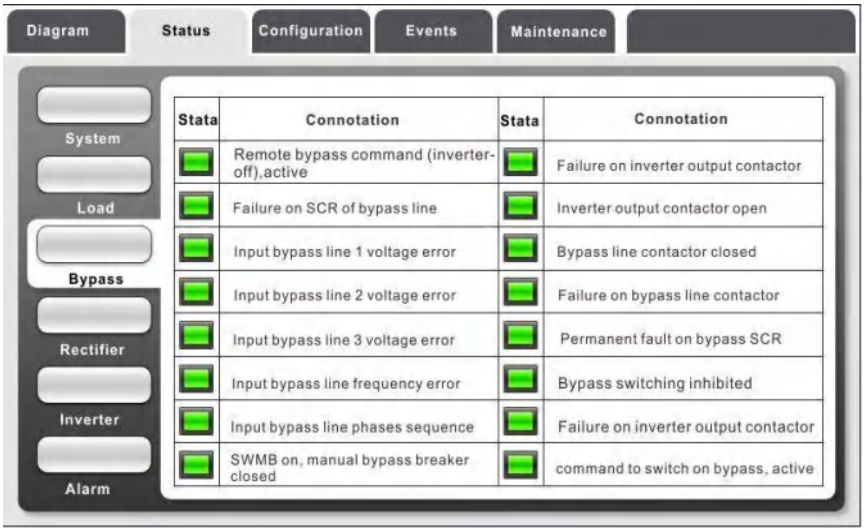
6. System status interface



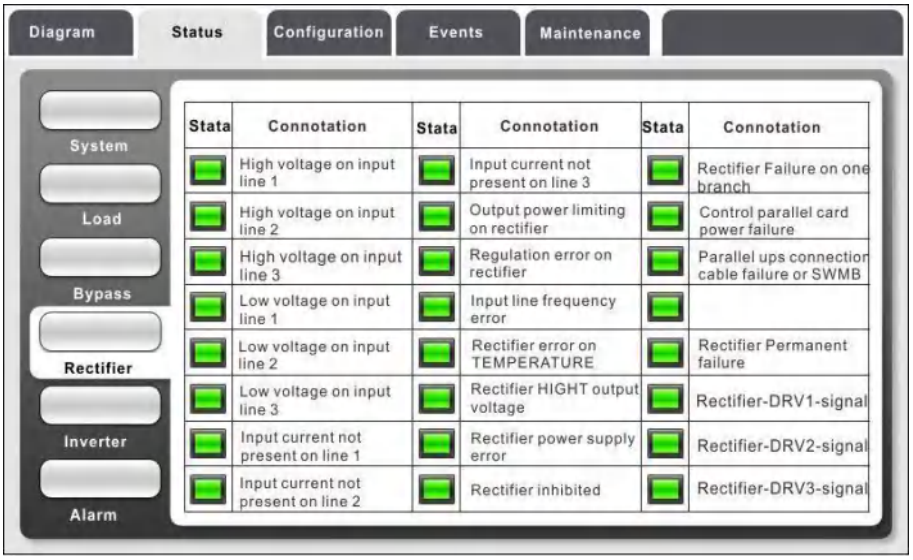
7. Output load status



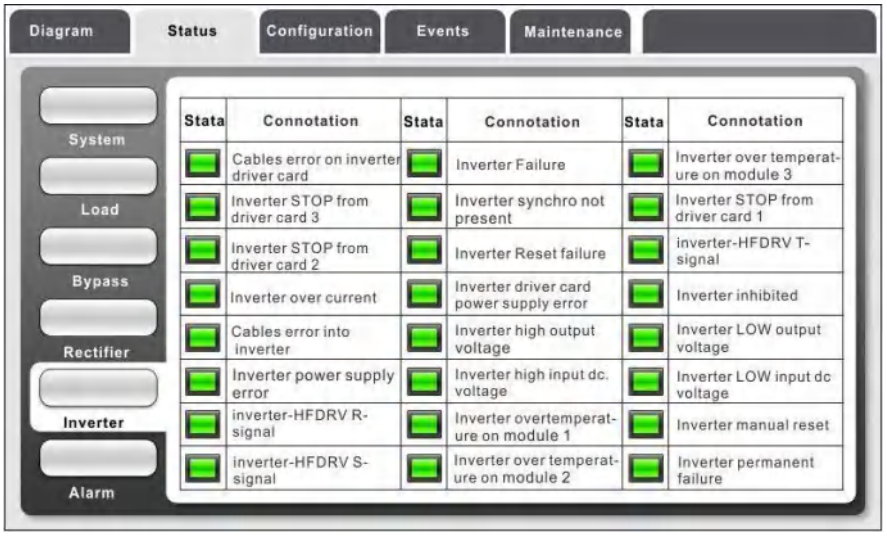
8. Bypass status



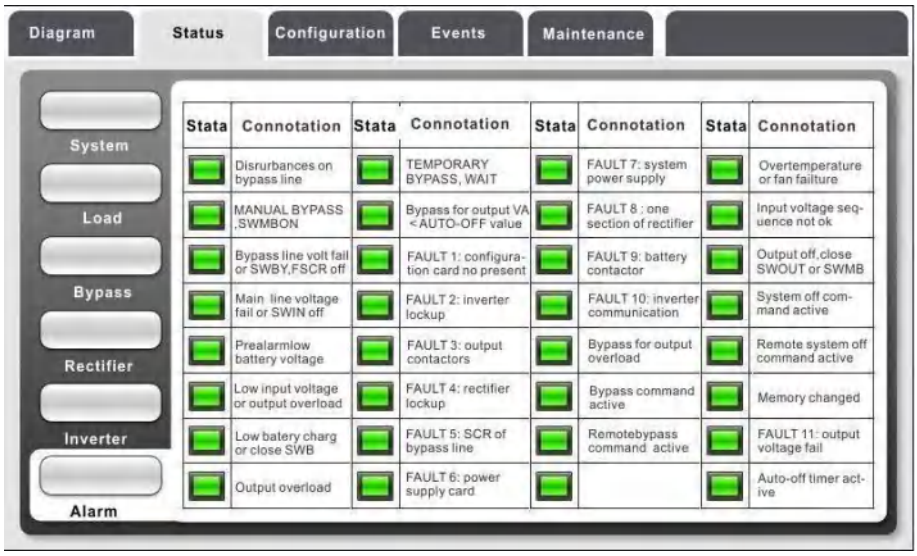
9. Rectifier and battery status



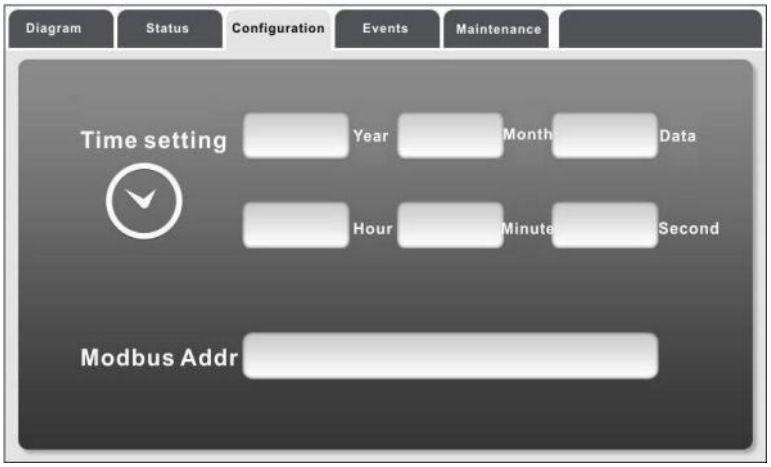
10. Inverter status



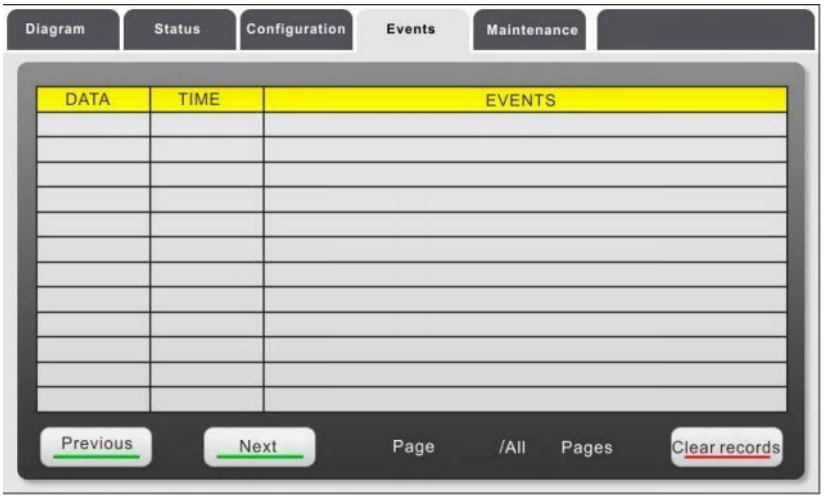
11. Alarm status



12. System configuration interface (click the corresponding location to modify the date, time and device address).

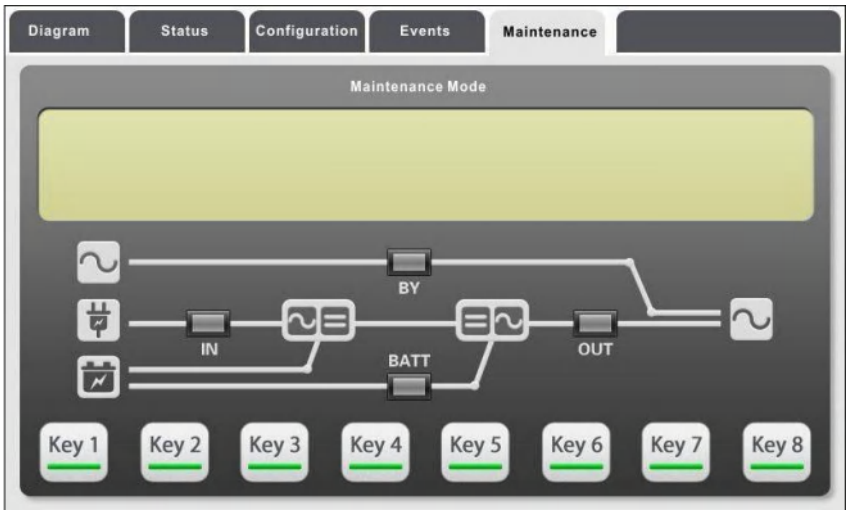


13. History interface



14. Maintenance mode interface (requires a password first)

Click "Maintenance Mode" on the flowchart to enter the maintenance interface, query and set the working parameters of the UPS. And the initial operation password is "436215".



IN. Mains and bypass input indicator
OUT. Inverter output indicator
BY. Bypass operation indicator
BATT. Battery Status Indicator

WARNING LIGHTS: LED.

The LED warning light on the maintenance interface provides quick UPS status information. In different states, it may remain lit, flashing, or extinguished.

☛ LED IN (green): input

lit	When the input mains power and bypass are normal
flashing	When the mains or bypass input is abnormal
extinguished	When the input mains power and bypass are abnormal

☛ LED OUT (green): inverter output

lit	When the UPS switches to the inverter output, and the output power meets the rated VA value. At this time, only SWOUT is on
flashing	When the UPS switches to the inverter output and the output power exceeds the rated VA value, or the switch SWMB is on.
extinguished	When the UPS switches to bypass output or the switch SWOUT is off.

☛ LED BY. (yellow): bypass output

lit	When UPS switches to bypass output
flashing	When the UPS switches to bypass output and the output power exceeds the rated VA value, or the switch SWMB is closed

extinguished When UPS switches to inverter output, or when UPS switches to bypass output, the switches SWOUT and SWMB are disconnected; or when UPS executes the SYSTEM OFF command

☛ LED BATT (yellow): battery output

lit	When the battery is supplying power
flashing	When the alarm PREALARM, LOW BATTERY VOLTAGE is active or the alarm BATTERY DISCHARGED OR SWB OPEN is active
extinguished	When the battery is not supplying power and its voltage is correct.

ALARM MESSAGES

The following are alarm messages that may appear on the first line of the display panel, with the number representing their priority level

[1] DISTURBANCES ON BYPASS LINE

Alarm is present when there are disturbances on the bypass line such as voltage peak and harmonic distortion, while voltage and frequency are normal. CAUTION! In this case, the inverter and bypass are asynchronous, so if they are forcibly switched to the bypass through the switch SWMB or remotely controlled, there may be voltage phase errors

[2] BY-PASS MANUAL, SWMB - ON or cable defect

The manual bypass switch SWMB is activated or the parallel communication is abnormal. In this case, it is impossible to return to normal operating and the load is directly powered by the bypass, so it is not protected by UPS. The 'cable defect' only applies to parallel models, as there is a signal communication connection error between parallel UPS, so the entire system iswitches to bypass mode

[3] BYPASS VOLT. FAIL or SWBY, FSCR OFF

- Alarm is present if:
- Bypass line input voltage is abnormal.
- Bypass line witch SWBY is disconnected.
- SCR fuse of the bypass line is open or burnt out due to output short circuit.

[4] MAIN LINE VOLTAGE FAIL or SWIN OFF

Input voltage is abnormal and the battery is discharging.
The alarm appears if:
- The input voltage or frequency exceeds the allowable.
- SWIN power switch is open.
- The rectifier does not recognize the voltage due to internal anomaly;

[5] PREALARM, LOW VOLTAGE ON BATTERY

The alarm is present if:
- The battery can only power the load for another 5 minutes
- The remaining supply time is lower than the alarm time set

[6] BATTERY DISCHARGED OR SWB OPEN

The UPS is carrying out a battery test.

[7] LOW VOLT. SUPPLY or OVERLOAD [W]

When:
- The input voltage is insufficient to feed the load.
- The load, in active power W, exceeds the rated maximum power value (W)

[8] OUTPUT OVERLOAD

The output capacity exceeds the rated value (VA), or when the instantaneous peak current of the load exceeds the allowable value. In this case, the output load must be reduced (removing unnecessary devices), otherwise the UPS will automatically switch to bypass mode (the delay time depends on the overload situation!)

[9] BY-PASS FOR VA OUTPUT < AUTO_OFF VALUE

This alarm is present when power in %VA, absorbed by the load is lower than the set value of" AUTO-OFF".The value of %VA for AUTO-OFF is set to 0 in the factory
(therefore this alarm condition can't happen).
The output capacity (VA) is less than the set value for automatic shutdown (AUTO-OFF). The default value at the factory is 0.

[10] INTERNAL FAULT: number

Different numbers represent different abnormal conditions:
1. Abnormal system configuration circuit
2. Abnormal inverter
3. Abnormal output contact of the inverter or abnormal bypass output contact (if equipped!)
4. Rectifier fault.
5. Fault of the SCR on bypass line.
6. The internal main power supply is abnormal, or the control board is short circuited.
7. The power supply of the control board is abnormal.
8. A certain area of the rectifier is abnormal because there is no current consumption in that area or it consumes 30% less than other areas.
9. Battery circuit contact fault.
10. Communication line between inverter and system is abnormal
11. Abnormal SCR switching or bypass power connection

[11] TEMPORARY BYPASS, WAIT

Indicates that the load is powered by the bypass line and the system is about to return to normal operating mode. For example, if an overload occurs in bypass mode, the system will automatically restore to the inverter output after the abnormal factors are eliminated

[12] BY-PASS FOR OUTPUT OVERLOAD (Displays continuously or flashes)

Flashing Display

The bypass has been overloaded and has been recorded in the history record. The abnormal overload condition must last for a period of time before it is recorded:

150% 10 min.
175% 1 min.
200% 18 s

The load will be powered by the bypass. If it has not been unloaded, the bypass will continue to supply power until the input SWBY switch or the bypass input fuse overload protection is activated. For models with a capacity of 100kVA or more, in the abnormal situation of bypass overload, they will not supply power to the load. When proper unloading is taken, the alarm can be cleared and UPS can return to normal operation by the following steps: close SWMB, open SWBY; then close SWBY and open SWMB.

Displays continuously

When the load is powered by bypass and exceeds the rated value, this warning has not been recorded yet, the overload value will be displayed on the panel (% VA). To return to normal operation mode before recording, unload and wait a few minutes for cooling (If only 50% of the load remains, wait for 60 seconds; if only 75% of the load remains, wait for 8 minutes).

[13] BYPASS COMMAND ACTIVE; 8=COMMAND OFF

By inputting special commands on the operation panel, the system switches to bypass. The shutdown command after the battery is discharged will not be recorded. In this case, when the input power is restored, the UPS returns to normal operating mode

[14] REMOTE BYPASS CONTROL: ACTIVE

The system is switched to bypass via a remote control signal. The command is not recorded and the UPS reverts to normal operation when the command is cancelled (if the input power is normal!).

[15] OVERTEMPERATURE or FAN FAILURE

1) UPS internal ambient temperature
2) Power modules in the converter circuit
3) Power modules in the rectifier circuit
4) Output transformer

Exceeded maximum allowable temperature (due to operating environment or fan failure!)

[17] INPUT VOLTAGE SEQUENCE NOT OK

Input phase sequences of the bypass line is not correct. Generally, it may be a wiring error, and the two live wires can be interchanged

[18] OUTPUT OFF, CLOSE SWOUT OR SWMB.

UPS does not have output voltage, because both switches SWOUT and SWMB are open.

[19] SYSTEM OFF COMMAND ACTIVE ; 8=DISACTIVE.

When the system shutdown command is given by a key or a remote signal, the system will delay for a few seconds before executing the shutdown command to allow the command to be canceled. The command will be recorded even if there is no input power after the system shuts down.
When input power is restored, the UPS will not return to normal operating mode if the SYSTEM OFF command is not canceled. To cancel the command, close switch SWBY or press button 8.

[20] SYSTEM OFF COMMAND ACTIVE; 8=COMMAND OFF.

As that of [19], commands are given through the remote port REMOTE

[21] MEMORY CHANGED: CODE = number

Different numbers represent different situations

Code 1 The system parameters are restored to the factory default values. If non-standard parameter values have already been set, they need to be reset. To cancel this message, you can first turn off the UPS and then turn it on.

NOTE: codes different from 1 can only appear temporarily. The operation of customizing parameters does not affect UPS operation.

[22] AUTO-OFF Timer: T off= 0: 0', T on 0: 0'

When the daily automatic activation/shutdown program is running (Please refer to the "CUSTOMISATION" section)
When the values of Toff and Ton are the same, counting will stop

RS232 REMOTE CONTROL

To connect the RS232 communication port with the remote control panel, it requires:
- a connecting lead with only three conductors for the signals TX, RX and GND equipped with standard 25-pole RS2332 connectors.
- a terminal with same baud rate and protocol as that of the UPS that can display ASCII code from UPS and transmit ASCII numbers from 0 to 9.
Communication ports with Microsoft Windows software installed on general personal computers are available.
Communication with the terminal is achieved by activating the function ECHO on the UPS or on command by the terminal.

Echo function activation:
- The remote terminal will receive a message from the UPS when an alarm or display message changes
- The remote terminal will transmit ASCII codes corresponding to numbers 0 to 8 to issue commands to the UPS.

Remote drive:
- The remote terminal can open the communication by sending in sequence two ASCII characters corresponding to the numerical keys 9 and 0 spaced with an interval between 0.5 and 2 seconds.

If the identification code of UPS is changed, the second code 0 must be changed to the correct identification code

-After communication is enabled, the remote terminal can transmit ASCII codes corresponding to the numerical keys 0 to 8 to issue commands to the UPS and receive messages from the UPS display

-When communication is enabled, transmitting the number 9 can only accept messages from the UPS without executing any commands

- When transmitting any number other than 0 to 9, communication can be turned off.

CONNECTION WITH COMPUTER

Any kind of computers can be connected to automatically store computer data before it is lost in the event of a power outage and the battery runs out of power.
Of course, the computer must be installed with specific power management software, and the computer's operating system must be compatible, so as to function properly.
There are also special software programs that can present the status of the UPS on the computer!

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