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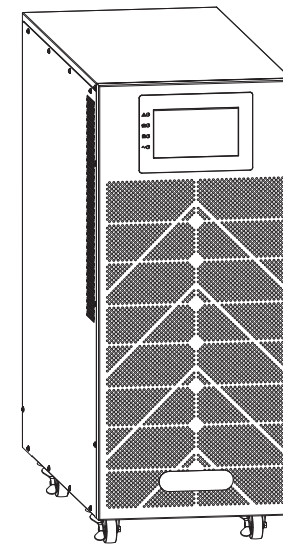
4256-6968 A



Compact-UPS

Models 60-80kVA

H Version For External Battery



User Manual

FOREWORD

Thank you for choosing this product of **Compact-UPS 60~80kVA** range.

EnSmart Power is highly specialised in the development and production of uninterruptible power supplies (UPS). The UPS device described in this manual is designed and manufactured with care to guarantee uninterrupted power for your equipments and give you the best performance.

This manual contains detailed instructions for product use and installation.

For information on using and getting the best performance from your UPS, this manual must be stored in a safe place and CONSULTED BEFORE TAKING ANY ACTION ON THE UPS.

Please obey the instructions and all the warning stated in the manual or on the UPS. Do not run the UPS before finishing reading the safety and operation instructions.

Note: Because of the continuous improvements, our products may differ somewhat from the contents included in this manual. You can contact local office to get the information when necessary.

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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. Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body!
4. Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire!
5. Don't disassemble the UPS cover, or there may be an electric shock!
6. Check if there exists high voltage before touching the battery
7. 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°C, 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
8. 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



WARNING!

Risk of electric shock



CAUTION!

Read this information to avoid equipment damage

2. Main Features

2.1 Summarization

This series UPS is a kind of three-in-three-out high frequency online UPS.

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

◆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.

◆Battery Configurable

from 32 blocks to 40 blocks, the battery voltage of this series UPS can be configured at 32 blocks, 34 blocks, 36 blocks, 38 blocks or 40 blocks according to your convenience.

◆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 plus LED 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

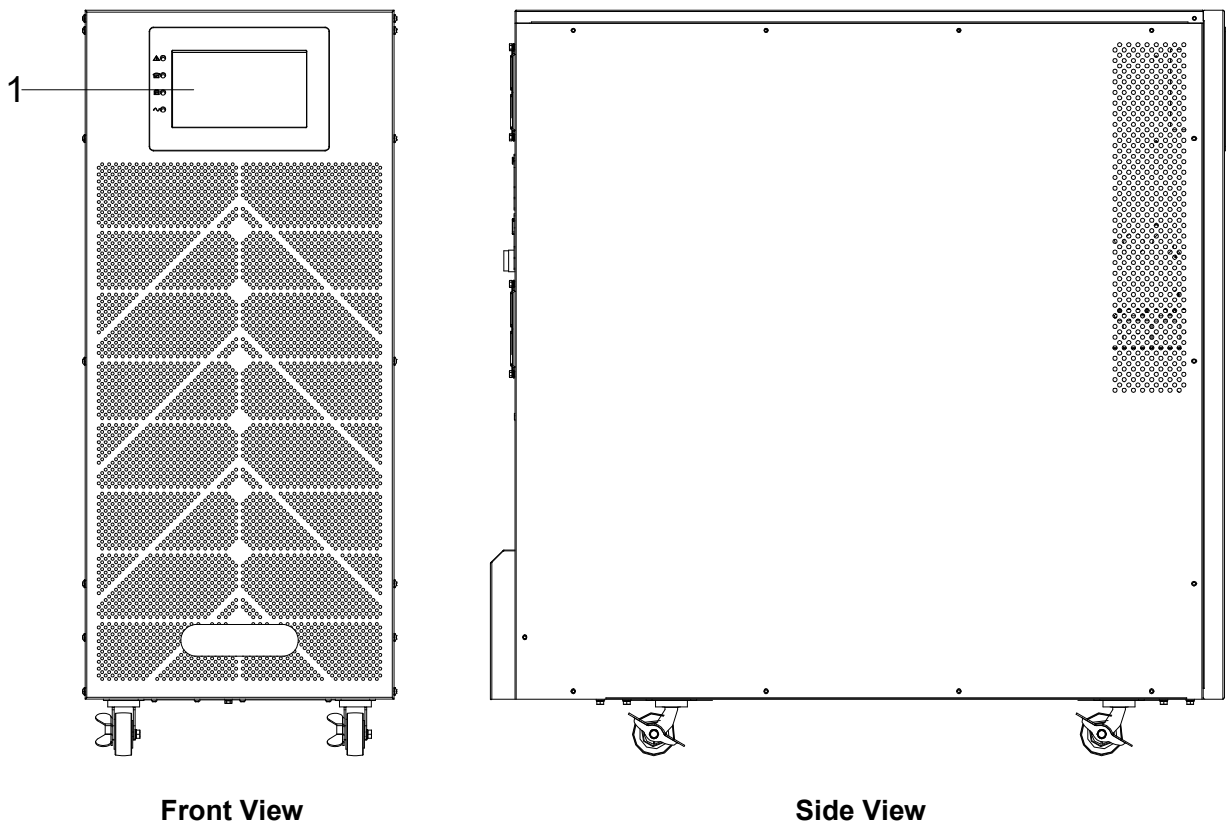
The series UPS may be completely shut off when the EPO is pressed. REPO function (Remote EPO) is also available in this series UPS.

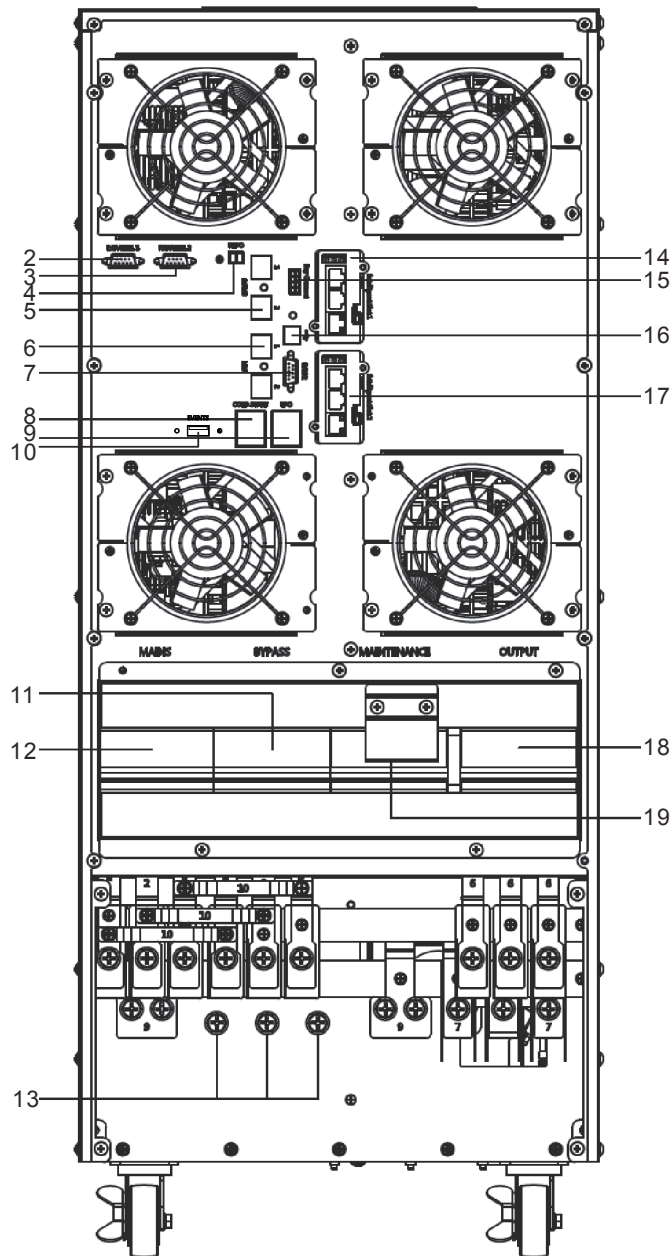
3. Installation

3.1 Unpack 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

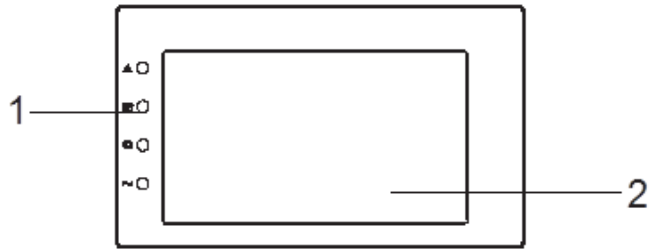




60-80kVA Rear View (terminal block without cover)

(1) LCD panel	(2) Parallel port 1
(3) Parallel port 2	(4) REPO port
(5) RS485 port	(6) LBS port
(7) RS232 port	(8) Cold start button
(9) EPO switch	(10) EVENTS port
(11) Bypass Switch	(12) I/P Switch
(13) Ground	(14) Intelligent Slot 1 (SNMP card/ Relay card)
(15) Dry contact port	(16) USB port
(17) Intelligent Slot 2 (SNMP card/ Relay card)	(18) O/P Switch
(19) Maintenance switch & its cover	

3.3 LCD control panel



LCD control panel introduction

(1) LED (from top to bottom: “alarm”, “bypass”, “battery”, “inverter”) (2) LCD display

3.4 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.



WARNING!

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.



CAUTION!

An unused battery must be recharged every 6months 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.

3.5 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.

3.6 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) .



WARNING!

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.

◆For future expansion purpose, it is economical to install power cable according to the full rating capacity initially. The diameter of cable is shown bellow:

UPS cabinet	Cable Dimension			
	AC Input (mm ²)	AC Output (mm ²)	DC Input (mm ²)	Grounding (mm ²)
60kVA	35	35	50	35
80kVA	50	50	75	50

**CAUTION!**

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

**WARNING!**

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

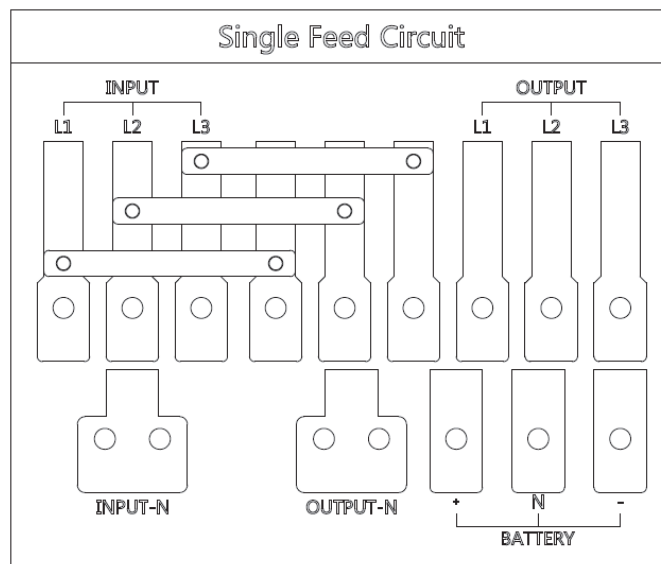
3.7 Power cable connect

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.

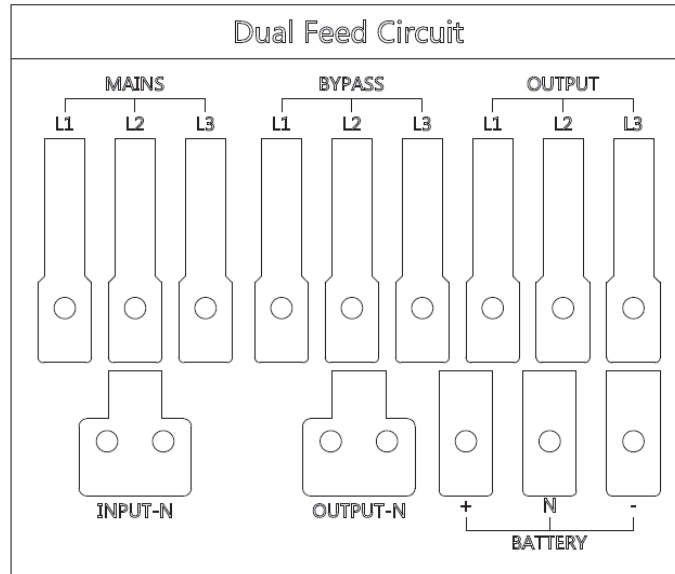
Open the UPS rear panel; Remove the cover of terminals for wiring easily.

3.7.1 Common input connection



M/1R Primary input Line	IN/OUT Input / Output
	Output-L1: Output Phase L1
Input-L1: Primary input Phase L1	Output-L2: Output Phase L2
Input -L2: Primary input Phase L2	Output-L3: Output Phase L3
Input -L3: Primary input Phase L3	Output-N: Output Neutral
Input-N: Input Neutral for primary and secondary input	GND: Grounding
	BAT+: Positive terminal of the batteries string
	BATN: Neutral terminal of the batteries string
	BAT-: Negative terminal of the batteries string

3.7.2 Dual input connection



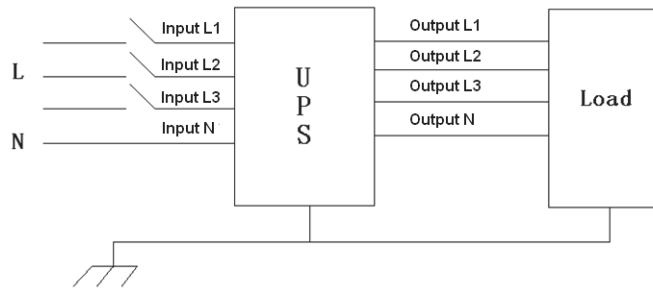
M/1R Primary input Line	IN/OUT Input / Output
B/2R Secondary/Bypass input line (optional)	Output-L1: Output Phase L1
Mains-L1: Primary input Phase L1	Output-L2: Output Phase L2
Mains-L2: Primary input Phase L2	Output-L3: Output Phase L3
Mains-L3: Primary input Phase L3	Output-N: Output Neutral
Input-N: Input Neutral for primary and secondary input	GND: Grounding
Bps-L1: Secondary input Phase L1	BAT+: Positive terminal of the batteries string
Bps-L2: Secondary input Phase L2	BATN: Neutral terminal of the batteries string
Bps-L3: Secondary input Phase L3	BAT-: Negative terminal of the batteries string

Warning!



In the case of “Dual input” operation, make sure the copper wire between each input lines have been removed. The AC input and the AC bypass supplies must be referenced to the same neutral point.

Choose appropriate power cable. (Refer to the table above) and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles;



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.



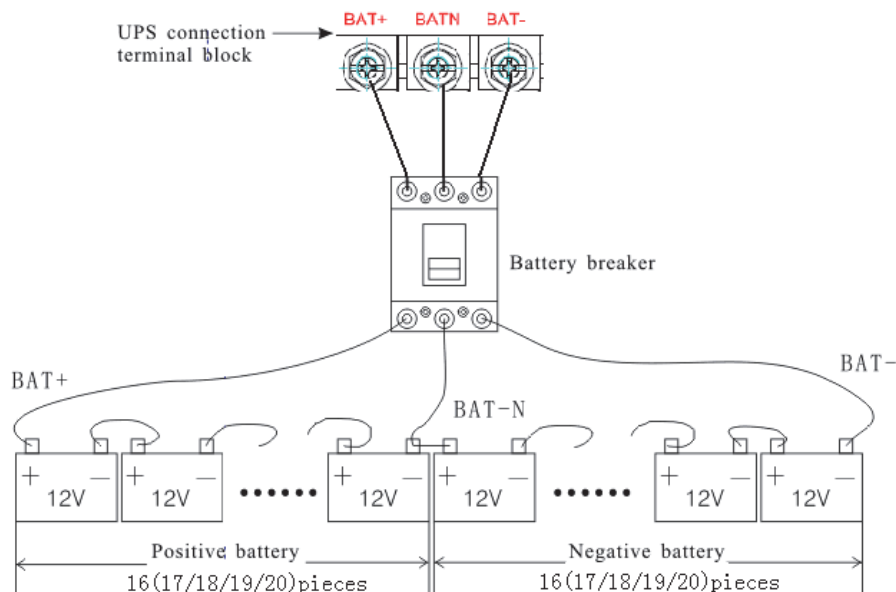
CAUTION!

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

3.8 Battery connection

The UPS adopts positive and negative double battery framework, totally 16pcs (optional 18/20) in series. A neutral cable is retrieved from the joint between the cathode of the 16th (17th/18th/19th/20th) and the anode of the 17th (18th/19th/20th/21th) of the batteries. 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.

External battery connections for long-run units.



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.

factory setting of the long-run unit is battery quantity---32pcs, battery capacity---12V65AH (charger current 9.75A). When connecting 32/34/36/38/40 batteries, please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software



CAUTION!

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.



WARNING!

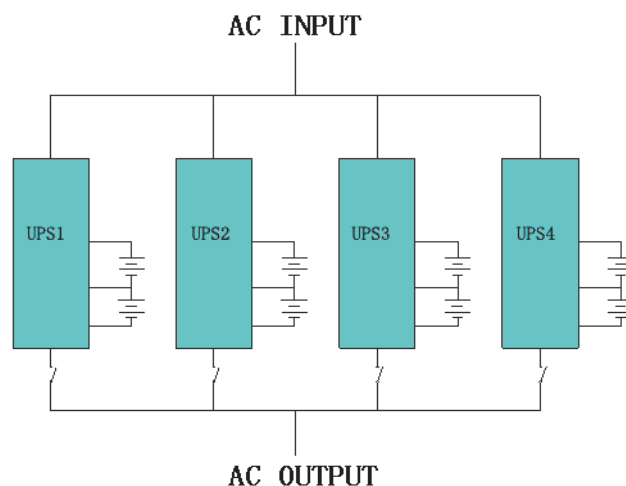
Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker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

3.9 UPS parallel Installation

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

3.9.1 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.

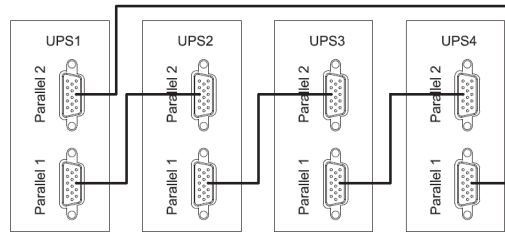


WARNING!

Make sure the N, L1, L2, L3 lines are correct, and grounding is well connected.

3.9.2 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.



3.9.3 Requirement for the parallel system

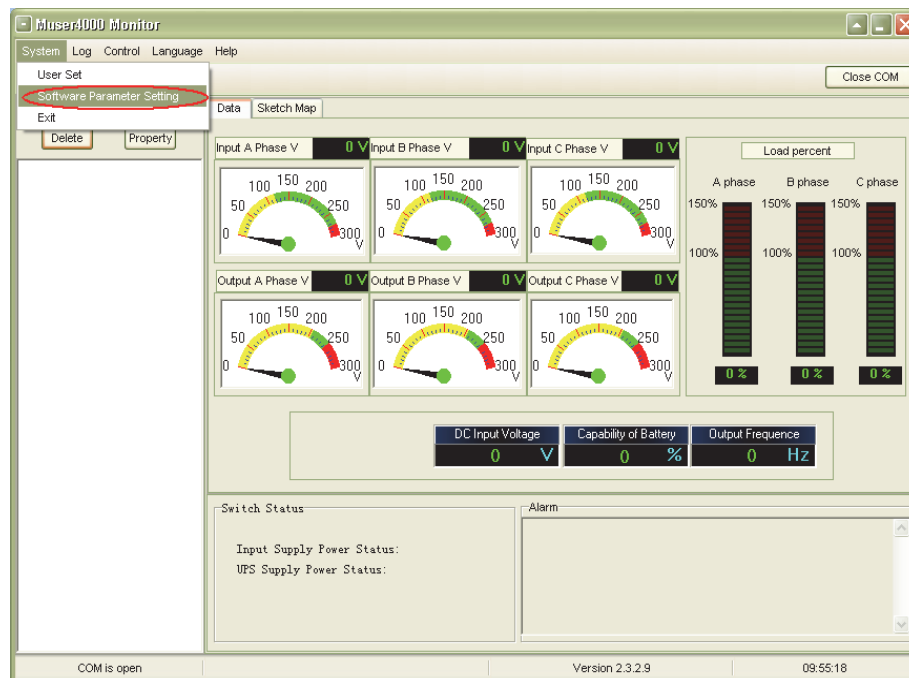
A group of paralleled UPS behaves as one large UPS system but with the advantage of presenting higher reliability. In order to assure that all UPS are equally utilized and comply with relevant wiring rules, please follow the requirements below:

- 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.

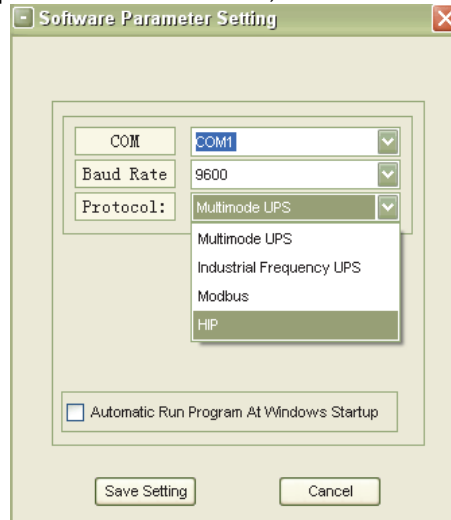
3.10 Computer access

◆ One end of a USB cable connect to the computer, the other end connect to the USB port on the UPS.

- ◆ Open the software Muser4000, click “system” button.



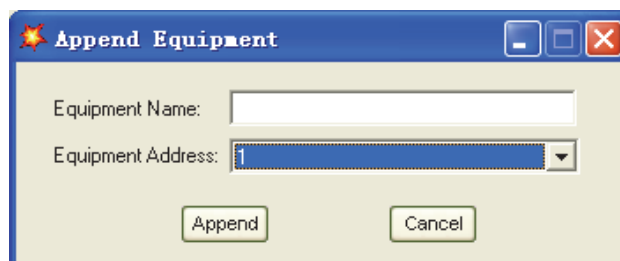
◆A window of “Software Parameter Setting” comes out as below, COM choose according to the UPS , baud rate choose 9600, protocol choose “HIP”, then save this setting.



◆On the main page of Muser4000, click the button of “Append”, then goes to a window of “Append equipment”.



◆Put the UPS name into “Equipment Name”, and UPS’ ID address into “Equipment address”.



◆Click the button “Append”, then the connection between UPS & computer is accomplished.



CAUTION!

When the UPS worked on inverter. If you want to use PC to set the output voltage and frequency. Must shut down the inverter first

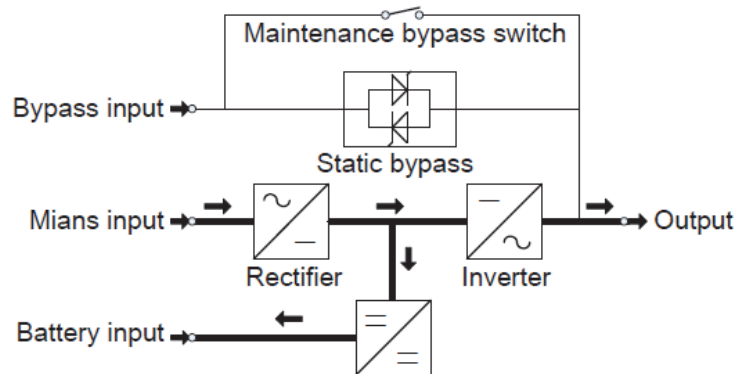
4. Operation

4.1 Operation Modes

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

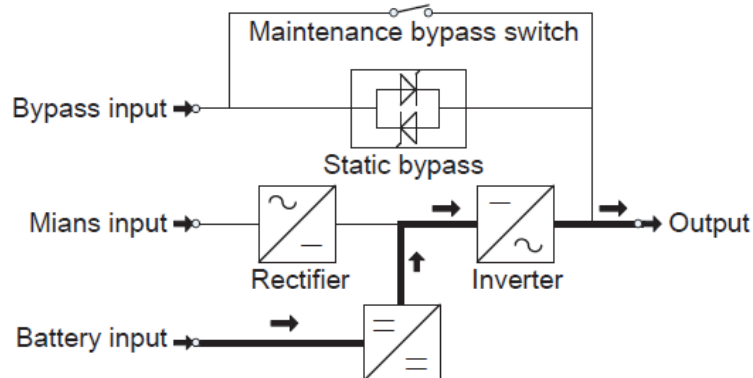
◆ Normal mode

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.



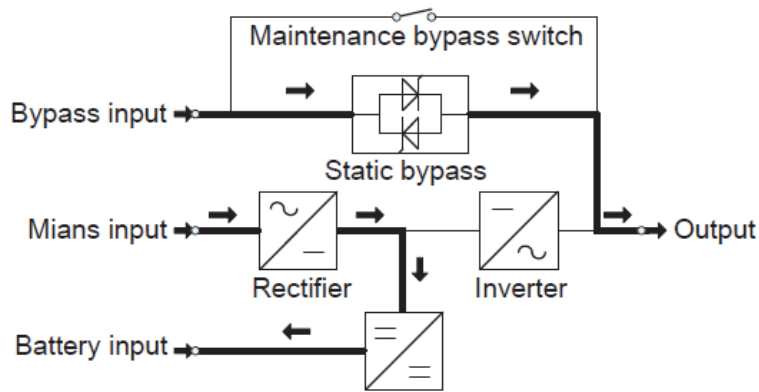
◆ Battery mode (Stored Energy Mode)

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.



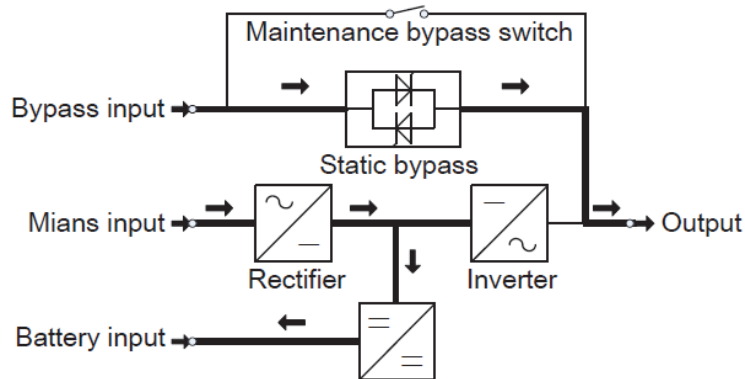
◆ Bypass mode

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 without interruption 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. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).



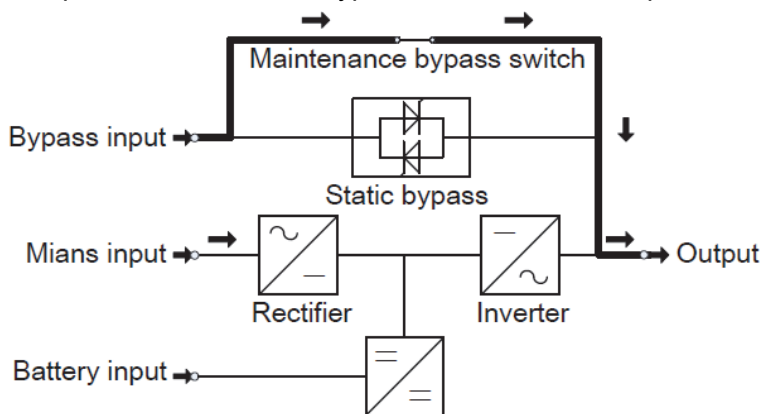
◆ **ECO Mode**

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 Restart procedure



CAUTION!

MAKE SURE GROUNDING IS PROPERLY DONE!

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

CAUTION!



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 OUTPUT breaker. (Below the UPS power units at the front door)
- ◆ Turn ON BYPASS breaker and MAINS breaker. (Below the UPS power units at the front door)

If the Rectifier input is within voltage range, the rectifier will start up in 30 seconds then the inverter will start up after then.

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



CAUTION!

The UPS is operating normally. It may take 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 after 20 seconds and the inverter will supply to the load. It is suggested to use Dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test ◦

4.2.3 MAINTENANCE BYPASS

To supply the load via Mains, you may simply active the internal mechanical bypass switch.



CAUTION!

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



CAUTION!

If the UPS is running normally and can be controlled through the display, carry out steps 1 to 6; otherwise, jump to Step 5.

- ◆ 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)



CAUTION!

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.

The UPS powers from the static bypass instead of 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 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.4 Cold start procedure

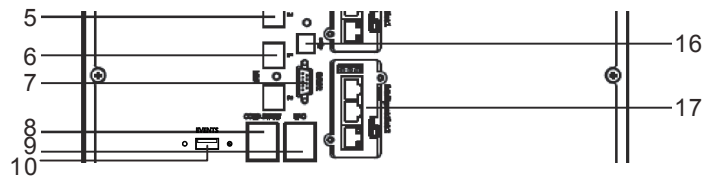


CAUTION!

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

- ◆ Turn on the BATTERY breaker.
The battery will feed the Auxiliary power board.

- ◆ Turn on the OUTPUT breaker.
- ◆ Trigger the cold start(Cold start) button as the position 8 of the below drawing.



When battery normal, rectifier starts operation, 30s later, inverter starts and operates and battery LED on.



CAUTION!

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

4.2.5 Shut down procedure



CAUTION!

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

- ◆ Switch OFF the BATTERY breaker;
- ◆ Open the UPS door to easily access to the main power switch;
- ◆ Switch OFF the MAINS breaker.
- ◆ Switch OFF the BYPASS breaker.
- ◆ Open 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 panel, 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.

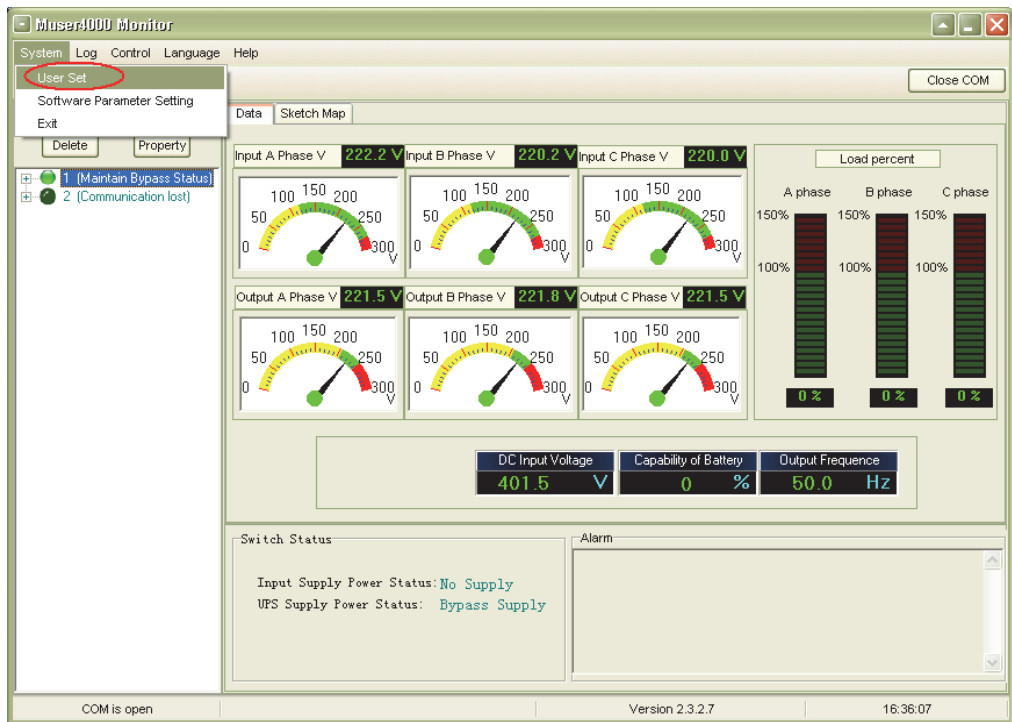
WARNING!



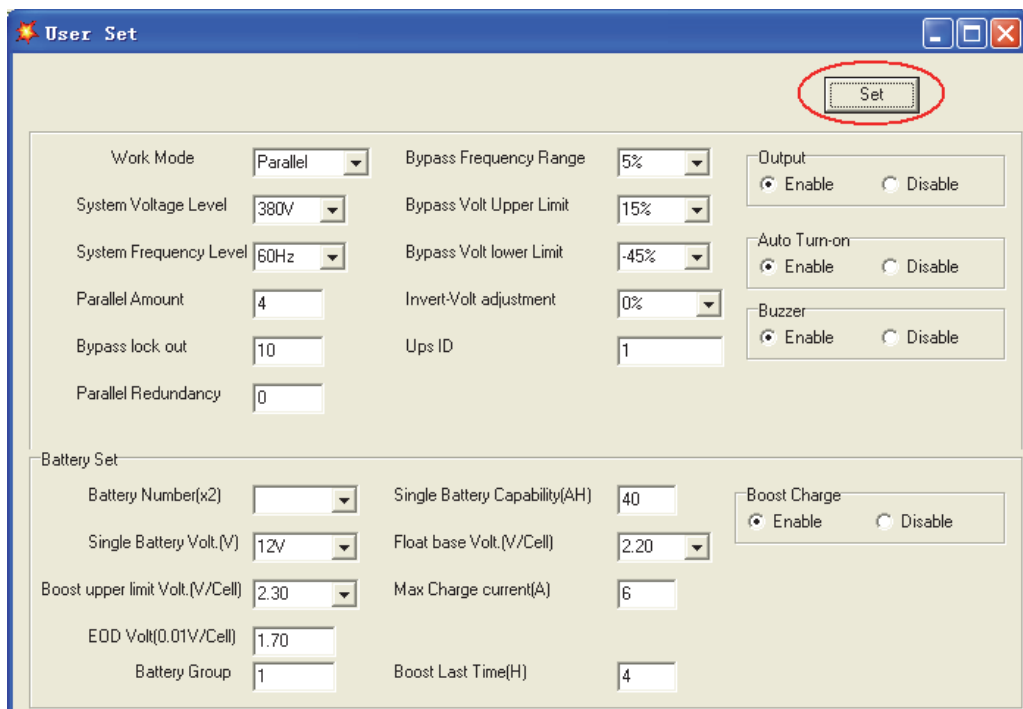
Wait for about 5 minutes for the internal D.C. bus bar capacitors to be completely discharged.

4.2.6 Parallel setting

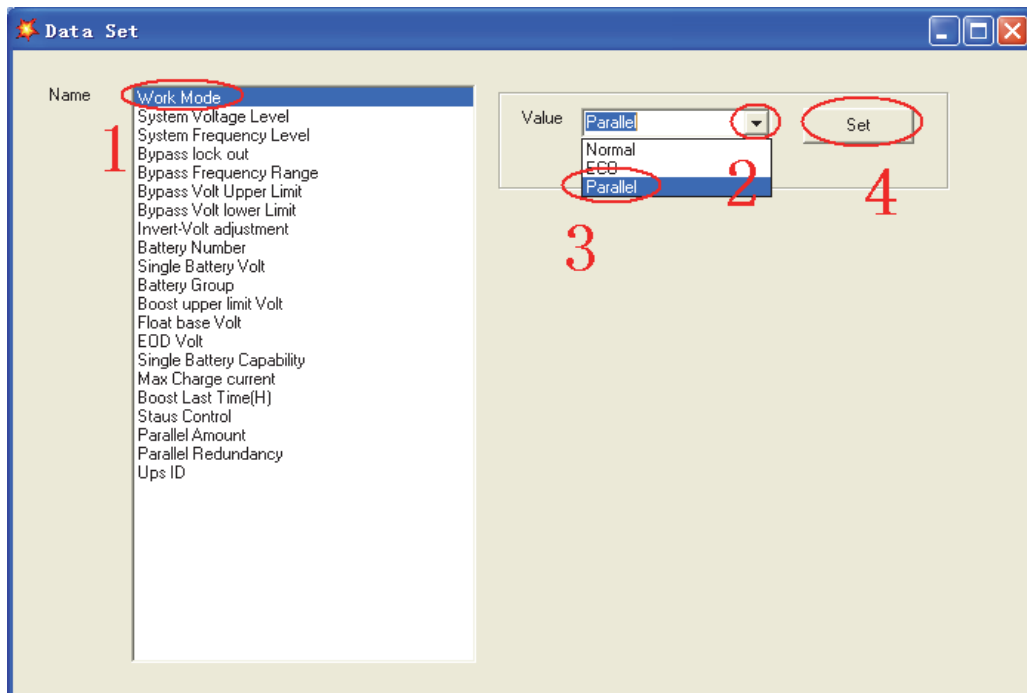
- ◆ Connect the UPS with computer. Power on the UPS.
- ◆ Open Muser4000 software, after connecting with the UPS successfully, click "System"->"User Set"



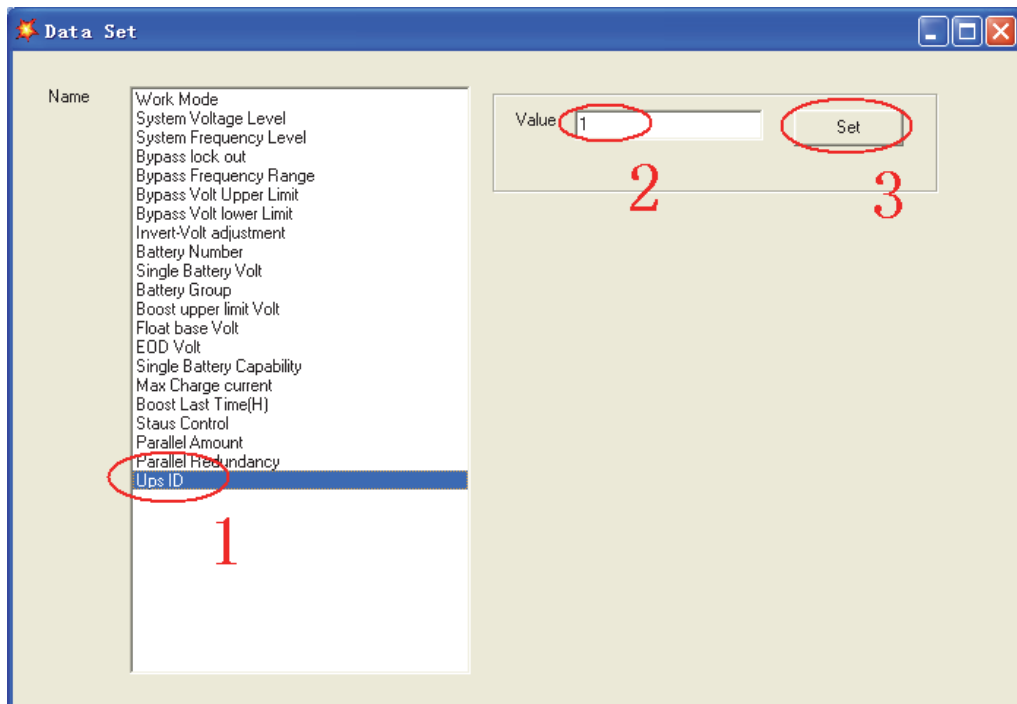
◆Click “Set” at “User Set” window;



◆At the window of “Data Set”, click “Work Mode”,, choose “Parallel” for the value, then click “Set” as shown in below picture. If the UPS sounds a “beep”, that means the setting is correct.



◆At the window of “Data Set”, click “Ups ID”, write a value for the parallel UPS ID at the right side, such as “1”, then click “Set” as shown in below picture. If the UPS sounds a “beep”, that means the setting is correct.



CAUTION!

After changing the parallel system ID, the connection between Muser4000 and equipment might be interrupted. If it occurs, please re-connect in accordance with the instruction described before.

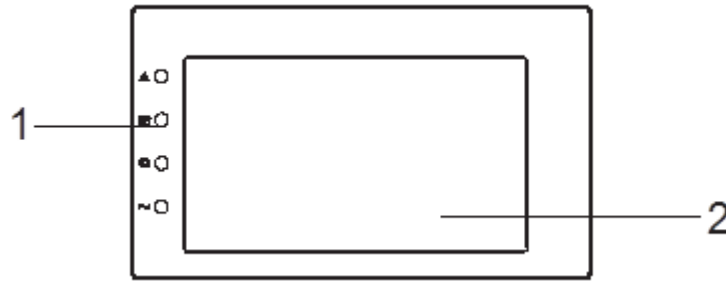


CAUTION!

Parallel cable cannot be connected when setting the parallel parameters.

◆After setting the UPS needed to be paralleled, power off all the UPS. Connect all the UPS according to “parallel cable installation”, and then power on the UPS.

4.3 The LCD Display



Overview of the operating panel of the UPS

- (1) LED (from top to bottom: “alarm”, “bypass”, “battery”, “inverter”)
- (2) LCD display

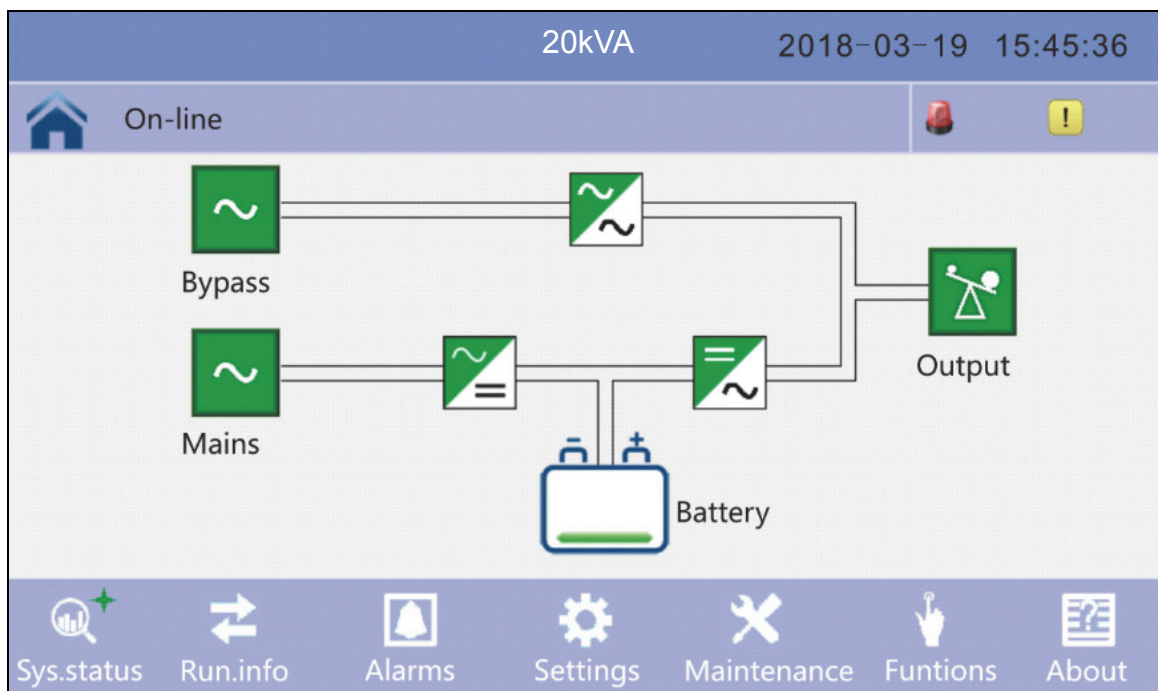
Introduction



CAUTION!

The display provides more functions than those described in this manual.

4.3.1 Home page 1, show the UPS operating flow chart, and there are the data entrance of input, output, battery.



1) Click on the bypass icon to enter the bypass data window, click on the back icon return to last window and click on the homepage icon jump to main page.

20kVA 2018-03-19 15:45:36

On-line

Bypass parameter

Phase voltage (V):	120.0	120.0	120.0
Frequency (Hz):	60.0	60.0	60.0

Back icon

2) Click on the mains icon to enter the mains data window, click on the back icon return to last window and click on the homepage icon jump to main page.

20kVA 2018-03-19 15:45:36

On-line

Mains parameter

Phase voltage (V):	120.0	120.0	120.0
Frequency (Hz):	60.0	60.0	60.0
Phase current (A):	30.0	30.0	30.0
Power factor :	0.99	0.99	0.99

Back icon

3) Click on the Load icon to enter the output data window, click on the back icon return to last window and click on the homepage icon jump to main page.

20kVA 2018-03-19 15:45:36

On-line

Output parameter

Phase voltage (V):	120.0	120.0	120.0
Frequency (Hz):	60.0	60.0	60.0
Phase current (A):	28.9	28.9	28.9
Active power (kW):	20.0	20.0	20.0

Navigation icons: Up, Down, Back

4) Click on the battery icon to enter the battery data window, click on the back icon return to last window and click on the homepage icon jump to main page.

20kVA 2018-03-19 15:45:36

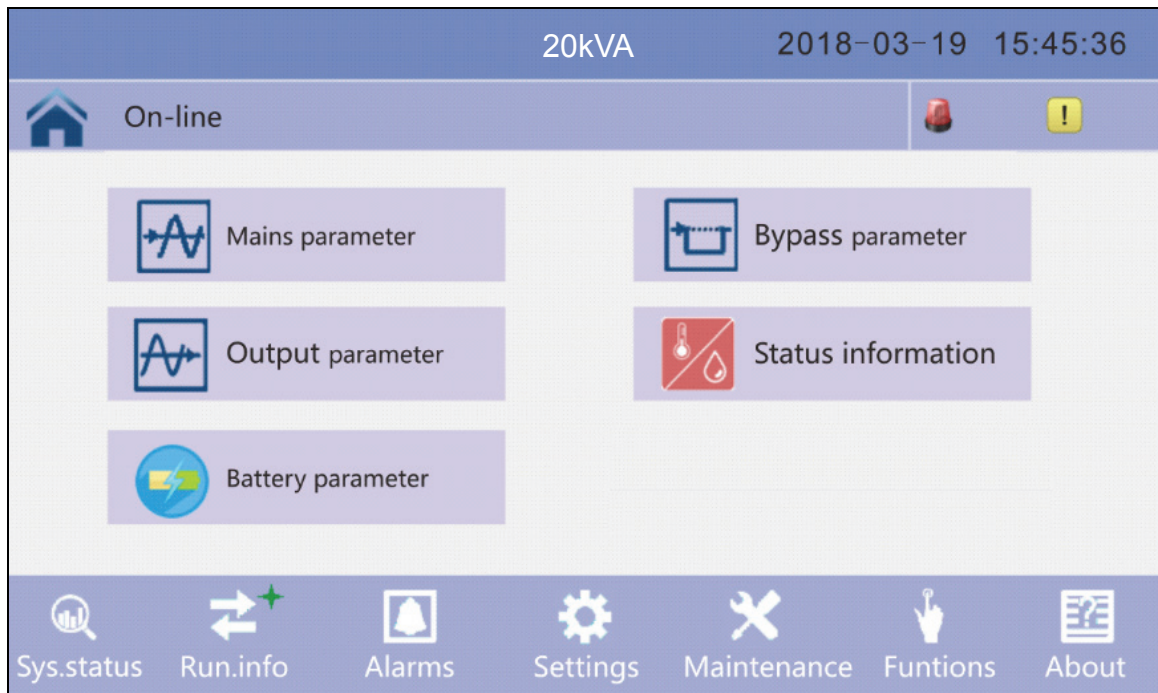
On-line

Battery parameter

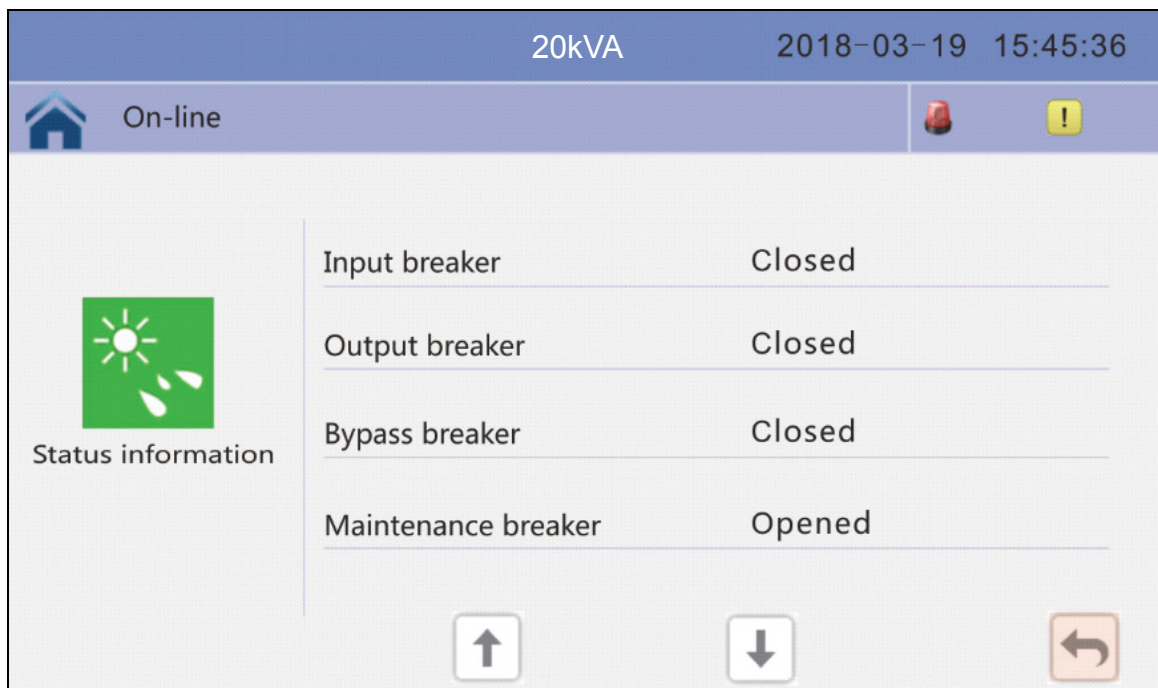
Voltage (V):	120.0	120.0
Current (A):	18.0	18.0
Battery status :	Charging	
Battery temperature (°C):	25	

Navigation icons: Up, Down, Back

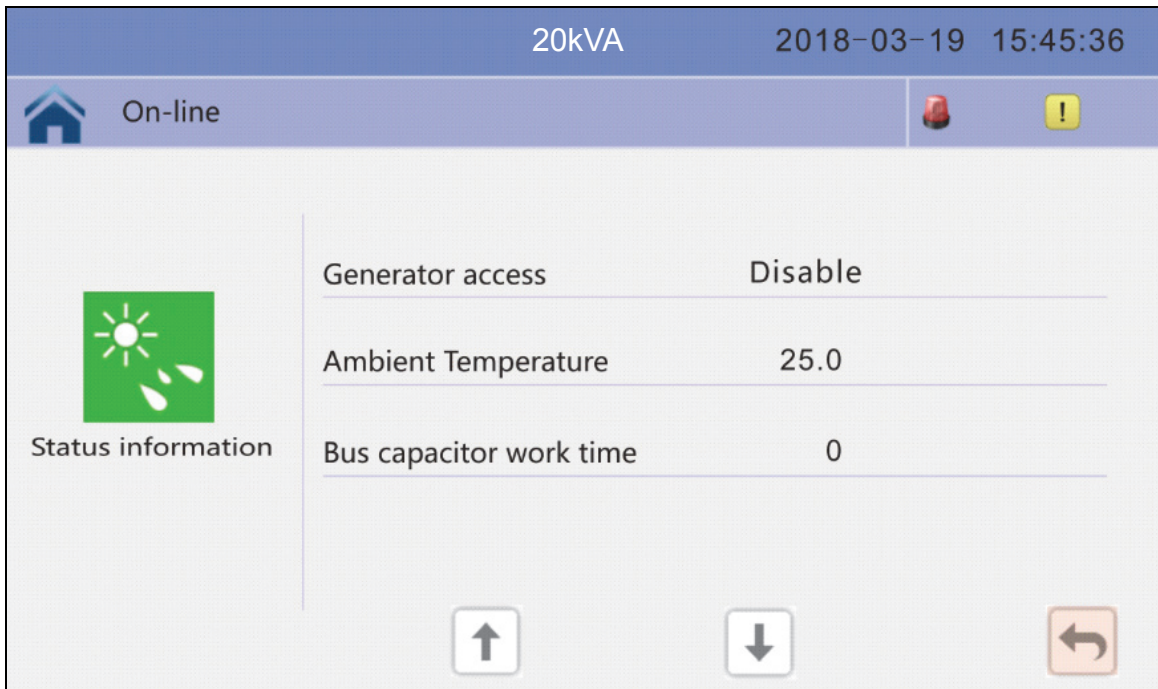
4.3.2 Click on Runn. info icon to enter the information page.



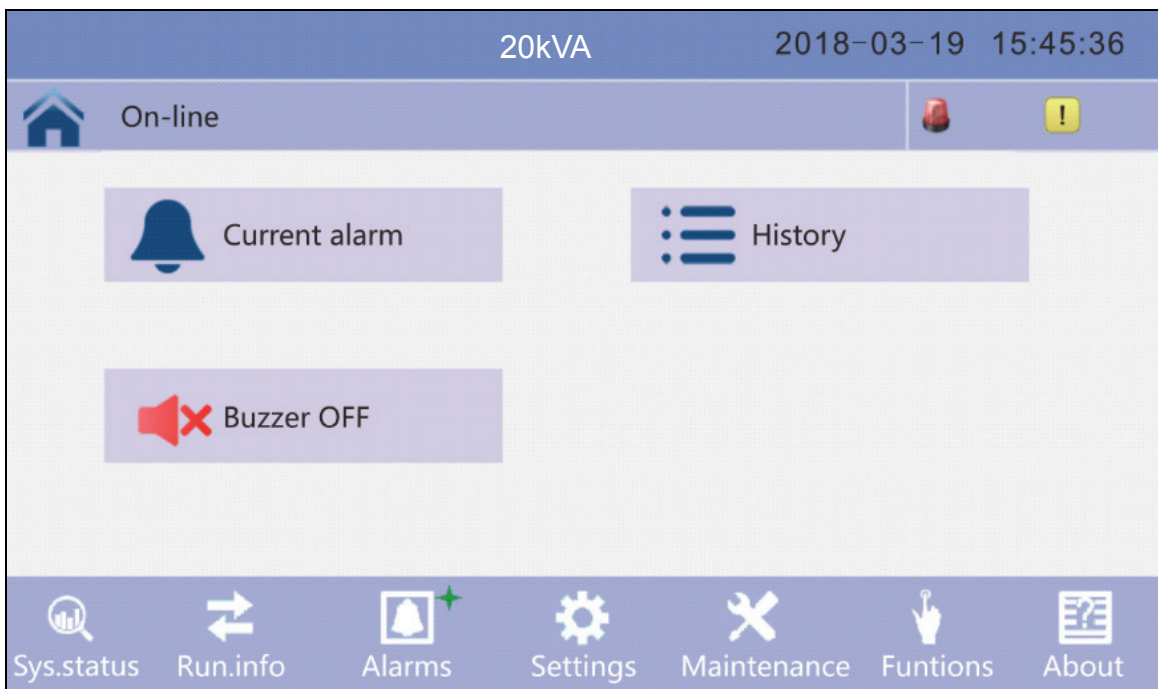
1) Click on the Run time icon to enter the status data window, can see the breaker status, click on the back icon return to last window and click on the homepage icon jump to main page.



2) Click on the ENV data icon to enter the status data window, can see the temperature data after connected to temperature sensor , click on the back icon return to last window and click on the homepage icon jump to main page.



4.3.3 Click on Alarm icon to enter the alarms page.



1) Click on the active Alarm icon to enter the module data window, can see the alarm data, click on the back icon return to last window and click on the homepage icon jump to main page.

20kVA 2018-03-19 15:45:36

No battery ! 1

Current alarm

No.	Grad	Information
0001	!	No battery

2) Click on the history icon to enter the history window, can see the history data, click on the back icon return to last window and click on the homepage icon jump to main page.

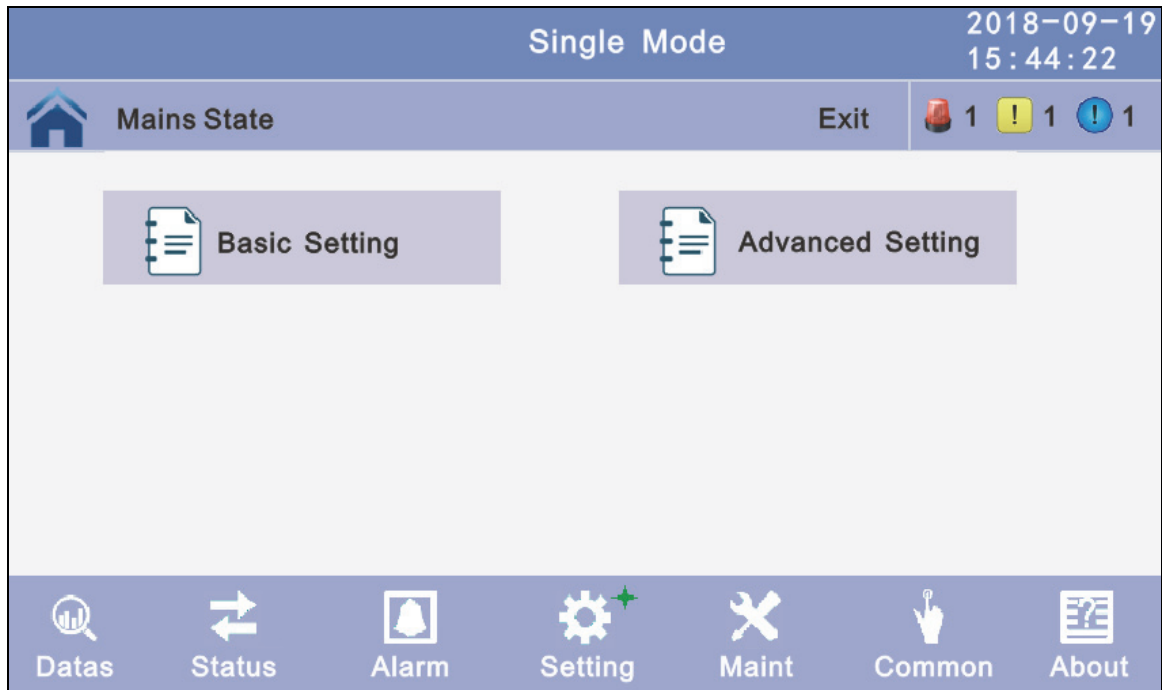
20kVA 2018-03-19 15:45:36

No battery ! 1

History

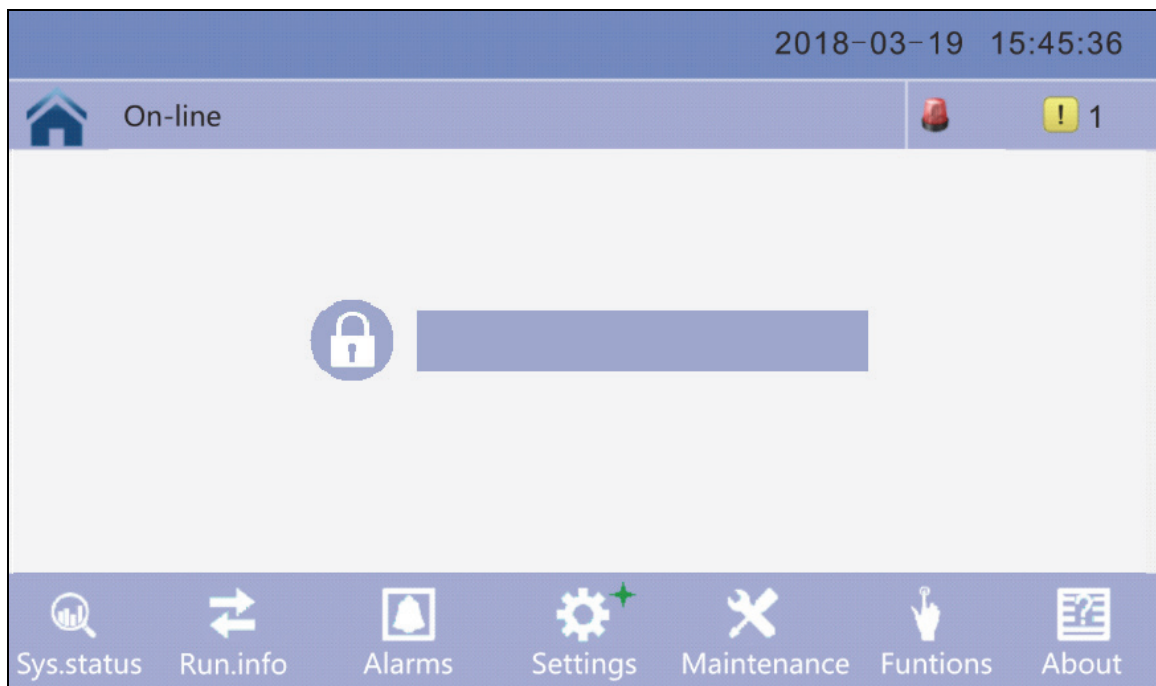
No.	Grad	Information	Location	Time
0001	!	No battery	System	2018-03-19 15:46:36
0002	!	On-line	System	2018-03-19 15:44:50
0003	!	Bypass breaker colosed	System	2018-03-19 15:44:40
0004	!	Fan fault	System	2018-03-19 15:44:36
0005	!	Rectifier fault	System	2018-03-19 15:44:30
0006	!	Batthey boost charging	System	2018-03-19 15:48:36

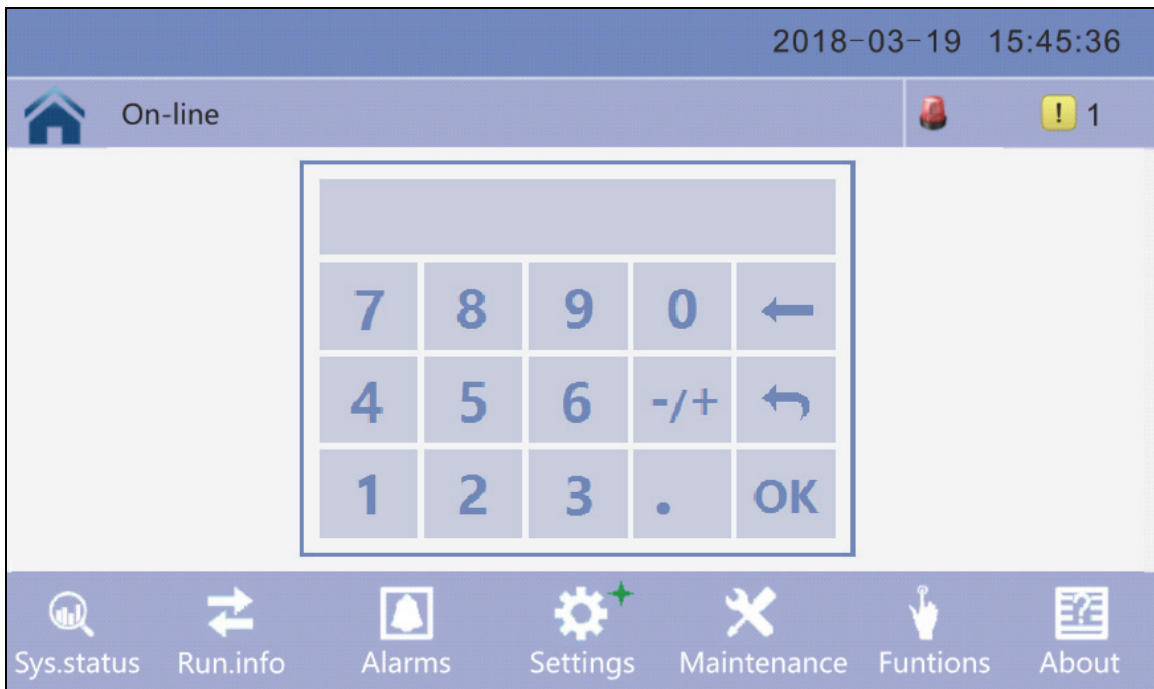
4.3.4 Click on setting icon to enter setting page, click on the back icon return to last window and click on the homepage icon jump to main page



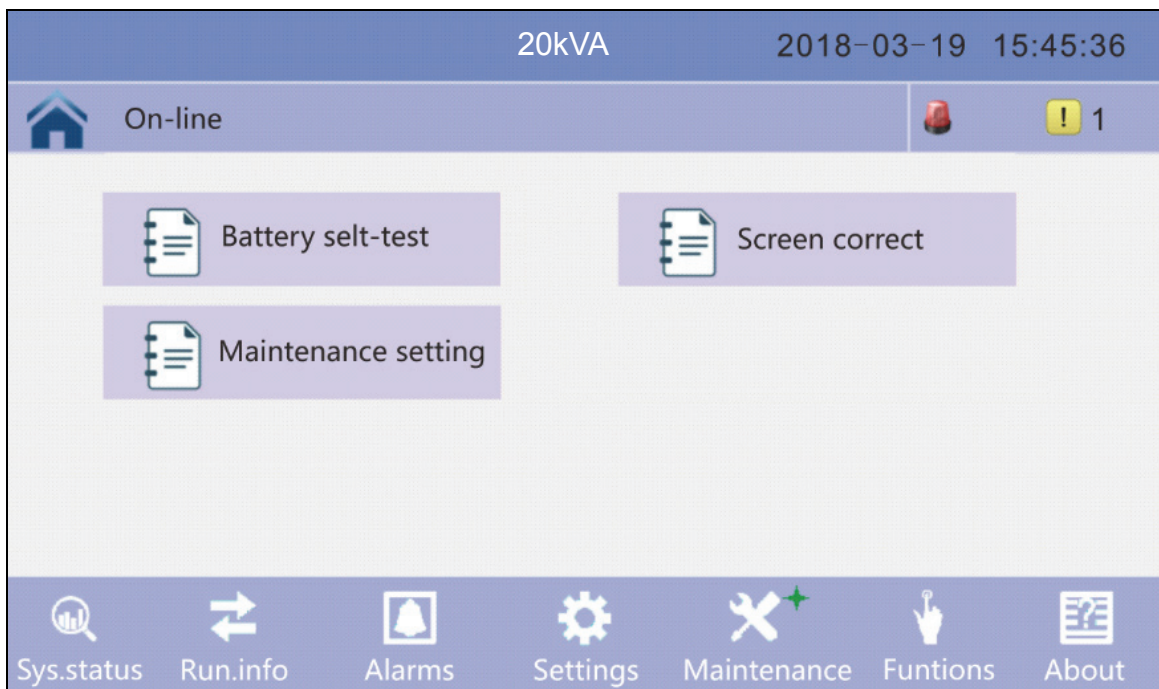
4.3.5 Click advanced setting, enter by input the correct password.

Note: This operation is recommended to be operated by professionals, or under the guidance of professionals. Require the password to your UPS supplier.

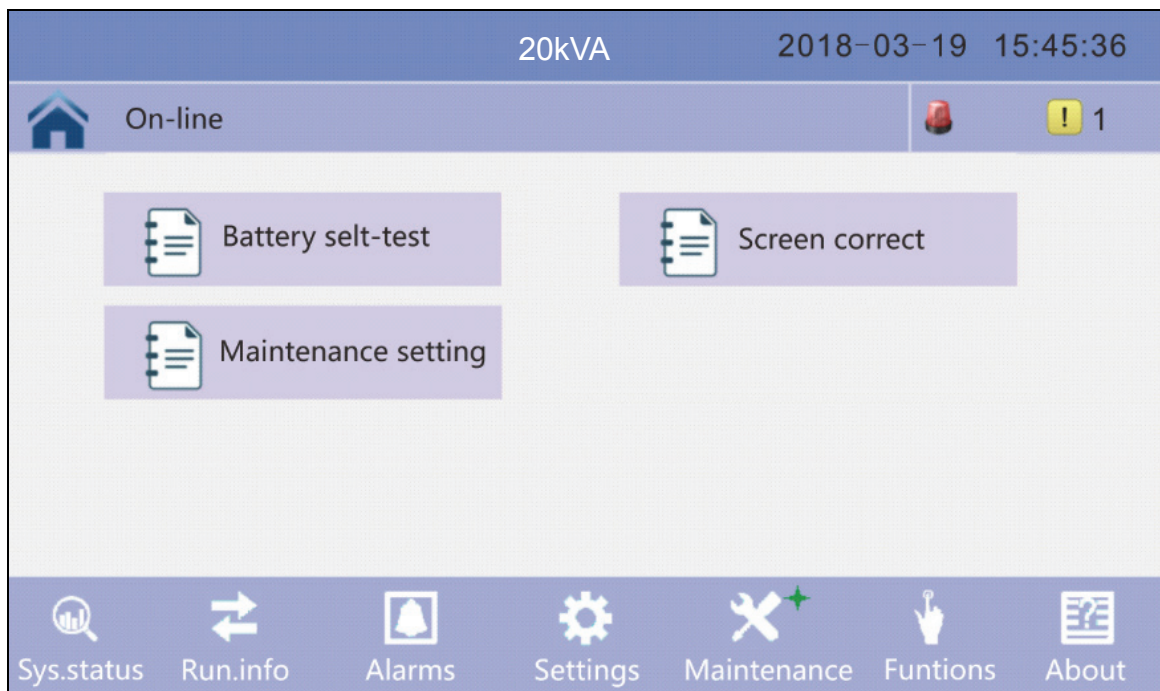




4.3.6 Click on Maintenance icon to enter setting page, click on the back icon return to last window and click on the homepage icon jump to main page



4.3.7 Click on Function icon to enter setting page, click on the back icon return to last window and click on the homepage icon jump to main page



Alarm Information

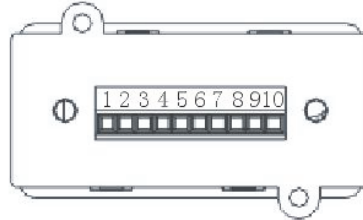
Fault code (Err)	UPS Alarm Warning	Buzzer	LED
1	Rectifier Fault	Beep continuously	Fault LED lit
2	Inverter fault(Including Inverter bridge is shorted)	Beep continuously	Fault LED lit
3	Inverter Thyristor short	Beep continuously	Fault LED lit
4	Inverter Thyristor broken	Beep continuously	Fault LED lit
5	Bypass Thyristor short	Beep continuously	Fault LED lit
6	Bypass Thyristor broken	Beep continuously	Fault LED lit
7	Fuse broken	Beep continuously	Fault LED lit
8	Parallel relay fault	Beep continuously	Fault LED lit
9	Fan fault	Beep continuously	Fault LED lit
10	Reserve	Beep continuously	Fault LED lit
11	Auxiliary power fault	Beep continuously	Fault LED lit
12	Initializtion fault	Beep continuously	Fault LED lit
13	P-Battery Charger fault	Beep continuously	Fault LED lit
14	N-Battery Charger fault	Beep continuously	Fault LED lit
15	DC Bus over voltage	Beep continuously	Fault LED lit
16	DC Bus below voltage	Beep continuously	Fault LED lit
17	DC bus unbalance	Beep continuously	Fault LED lit
18	Soft start failed	Beep continuously	Fault LED lit
19	Rectifier Over Temperature	Twice per second	Fault LED lit
20	Inverter Over temperature	Twice per second	Fault LED lit
21	Input neutral loss	Twice per second	Fault LED lit
22	Battery reverse	Twice per second	Fault LED lit
23	Cable connection error	Twice per second	Fault LED lit
24	CAN comm. Fault	Twice per second	Fault LED lit
25	Parallel load sharing fault	Twice per second	Fault LED lit

Relay card

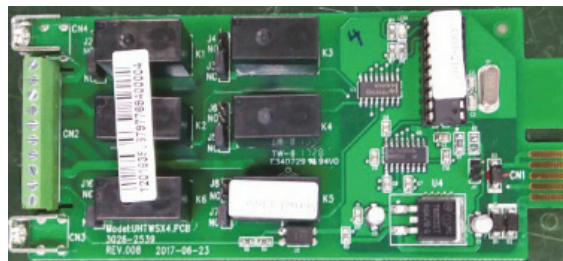
A 10-pin terminal is supported to offer the signals of Bypass, Utility Failure, Inverter On, Battery Low, UPS fault, UPS Alarm, and UPS Shutdown.

The relay communication card contains six dry contact outputs and one dry input. The inputs and outputs are factory programmed according to functions listed in the table

Table: Relay Contacts (communication card)



Pin	Function Description	Input or Output
1	Utility Failure	Output
2	Battery Low	
3		
4	Bypass On	
5	UPS Fault	
6	Inverter On	
7	Summary Alarm	
8	common	
9	Remote Shutdown +	Input (5~12V)



Appendix 1 Specifications

MODEL	60KVA	80KVA
Capacity (VA/Watts)	60K / 54K	80K / 72K
INPUT		
Nominal voltage	380/400/415Vac, (3Ph+N+PE)	
Operating voltage range	208~478Vac	
Operating frequency range	40Hz-70Hz	
Power factor	≥0.99	
Harmonic distortion (THDi)	≤3% (100%non-linear load)	

Bypass voltage range	220Vac Max.voltage: +25%(optional +10%,+15%,+20%) 230Vac Max.voltage: +20%(optional +10%,+15%) 240Vac Max.voltage: +15%(optional +10%) Min. voltage: -45% (optional -20%,-30%) Frequency synchronize tracing range: $\pm 10\%$	
Generator input	Support	
OUTPUT		
Output voltage	380/400/415Vac (3Ph+N+PE)	
Voltage regulation	$\pm 1\%$	
Power factor	0.9	
Output frequency	1.Line Mode: synchronize with input; when input frequency $> \pm 10\%$ ($\pm 1\%/\pm 2\%/\pm 4\%/\pm 5\%$ optional), output (50/60 ± 0.1)Hz. 2.Battery Mode:(50/60 ± 0.1)Hz	
Crest factor	3:1	
Harmonic distortion (THD)	$\leq 2\%$ with linear load $\leq 5\%$ with non linear load	
Efficiency	94.5%	
BATTERY		
Battery voltage	Optional Voltage: $\pm 192V/\pm 204V/\pm 216V/\pm 228V/\pm 240V$ dc(32/34/36/38/40pcs optional)	
Charge Current(A) (charge current can be set according to battery capacity installed)	Max.current 30A	
SYSTEM FEATURES		
Transfer time	Utility to Battery : 0ms; Utility to bypass: 0ms	
Overload	Load $\leq 110\%$: last 60min, $\leq 125\%$: last 10min, $\leq 150\%$: last 1min, $\geq 150\%$ change to bypass.	
Alarm	overload, utility abnormal, UPS fault, battery low, etc.	
Protection	short circuit, overload, over temperature, battery low, fan fault alarm.	
Communication	USB,RS232, RS485, Parallel port, REPO port, LBS port, Coupler dry contact, Intelligent slot, SNMP card (optional), Relay card (optional)	
ENVIRONMENTAL		
Operating temperature	0 $^{\circ}$ C \sim 40 $^{\circ}$ C	
Storage temperature	-25 $^{\circ}$ C \sim 55 $^{\circ}$ C (no battery)	
Humidity range	0 \sim 95% (non condensing)	
Altitude	< 1500m.When>1500m,lower the rated power for use	
Noise level	<63dB	
PHYSICAL		
Dimension D \times W \times H (mm)	828x360x868	
Net weight (kg)	118	122
STANDARDS		
Safety	IEC/EN62040-1,IEC/EN60950-1	
EMC	IEC/EN62040-2,IEC61000-4-2,IEC61000-4-3,IEC61000-4-4,IEC61000-4-5,IEC61000-4-6,IEC61000-4-8	

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.

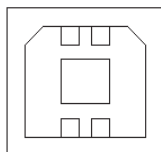
Read the user manual carefully, it can help a lot for using this UPS in the right way. Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

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	Utility LED is flashing	Utility voltage exceeds UPS input range.	If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.
5	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.
6	Buzzer beeps every 0.5 seconds and LCD display "output overload"	Overload	Remove some load
7	Buzzer long beeps, LCD display "29"fault code	The UPS output is in short circuit	Make sure the load is not in short circuit, and then restart the UPS.
8	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
9	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.

10	Buzzer beeps continuously and LCD indicates 1,3,5,9,15, etc fault codes	UPS is out of order	Consult with your local agent for repair
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Appendix 3 USB communication port definition

Definition of port:



Connection between PC USB port and UPS USB port.

PC USB port	UPS USB port	Description
Pin 1	Pin 1	PC : +5V
Pin 2	Pin 2	PC : DPLUS signal
Pin 3	Pin 3	PC : DMINUS signal
Pin 4	Pin 4	Signal ground

Available function of USB

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

Communication data format

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none

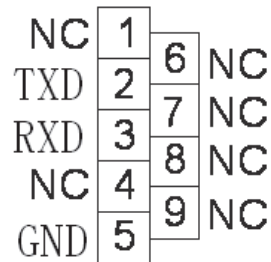


CAUTION!

USB, RS232 and RS485 interface cannot be used at the same time, you can only use one of them at one time.

Appendix 4 RS232 communication port definition

Definition of Male port:



Connection between PC RS232 port and UPS RS232 port

PC RS232 port	UPS RS232 port	
Pin 2	Pin 2	UPS send,PC receive
Pin 3	Pin 3	PC send,UPS receive
Pin 5	Pin 5	ground

Available function of RS232

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

RS-232 communication data format

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none

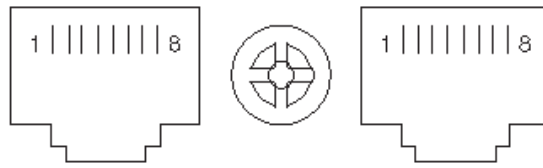


CAUTION!

USB, RS232 and RS485 interface cannot be used at the same time, you can only use one of them at one time.

Appendix 5 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"
Pin7	Pin7	+12Vdc
Pin8	Pin8	GND

Available function of RS485

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

Communication data format

Baud rate ----- 9600bps

Byte length ----- 8bit

End bit ----- 1bit

Parity check -----none



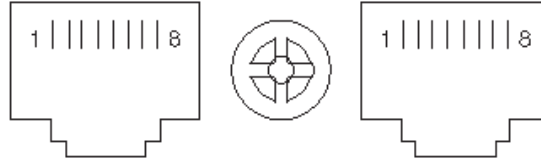
CAUTION!

USB, RS232 and RS485 interface cannot be used at the same time, you can only use one of them at one time.

RS485 port pin7 is 12Vdc!

Appendix 6 BAT_T communication port definition

Definition of port:



Connection between the Temperature sensor RJ45 port and UPS RJ45 port.

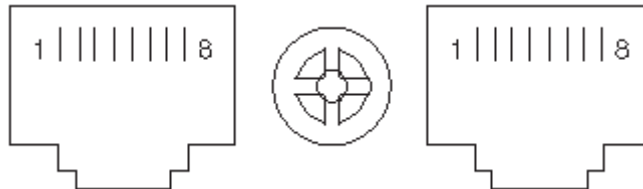
Temperature sensor(RJ45)	UPS BAT_T (RJ45)	Description
Pin 1/5	Pin 1/5	TX
Pin 2/4	Pin 2/4	RX
Pin 7	Pin 7	12V
Pin 8	Pin 8	GND

Available function of BAT_T

- ◆ Battery environment temperature monitoring.
- ◆ Charging voltage modulation depending on batteries' temperature.

Appendix 7 LBS communication port definition

Definition of port:



Connection between the UPS1's LBS1 port and UPS2's LBS2 port.

UPS1 LBS1 (RJ45)	UPS2 LBS2 (RJ45)	Description
Pin 1/5	Pin 1/5	LBS_BPSIDE_BC
Pin 2/4	Pin 2/4	LBS_TRACE_BC
Pin 8	Pin 8	GND

Available function of LBS

- ◆ The output power of two or more UPS in non-parallel system should be synchronized with each other.
- ◆ The output phase of two or more UPS in non-parallel system should be synchronized with each other.

CAUTION!

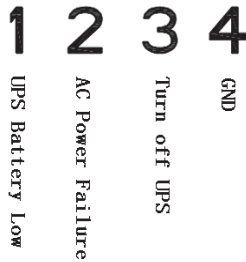


Two or more LBS cables must be used to form a ring when two or more LBS in non-parallel system.

Appendix 8 Dry contact port communication port definition

Definition of Male port:

Drycontact



Instruction:

UPS	Instruction
Pin1	UPS Battery Low
Pin2	AC Power Failure
Pin3	Turn off UPS
Pin4	Common GND

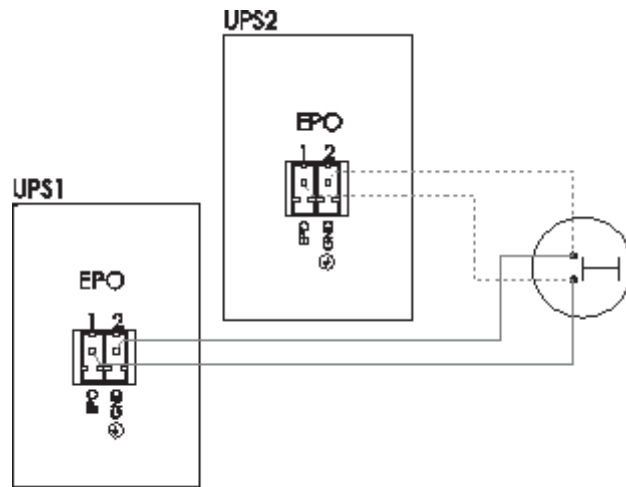
Function description:

- ◆ Monitor UPS status;
- ◆ Monitor UPS battery status;
- ◆ Shutdown UPS.

Appendix 9 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 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 stop all units at once.