Power Systems Solutions

PMU-T

Online UPS

10 - 40kVA

User Manual

Rev1 -23.06.23

Contents

1.1 Introduction statement

Thank you for choosing PMU-T by PSS Distributors, ranging from 10-40kVA. The PMU-T is an Online Double Conversion UPS designed for use in the IT and medical industries. The versatile battery configuration, internal or external makes it ideal for use in many different applications. With its modular design and large range of accessories, use and maintenance is made simple.

Keep this manual in a safe place for future reference as it contains instructions relating to safety, installation, operation, maintenance, and warranty of this product.

We reserve the right to change the specifications without notice.

2.0 Safety notes and symbols

2.1 Safety notes

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 are supplementary for the local safety instructions. Our company will not assume the liability that caused by not following safety instruction. Installation, maintenance, and commissioning of the equipment must be done by authorised personnel or PSS staff.

2.2 Symbols used in this guide

WARNING!
Risk of electric shock

CAUTION
Read all information before proceeding

3 Installation

3.1 Transportation

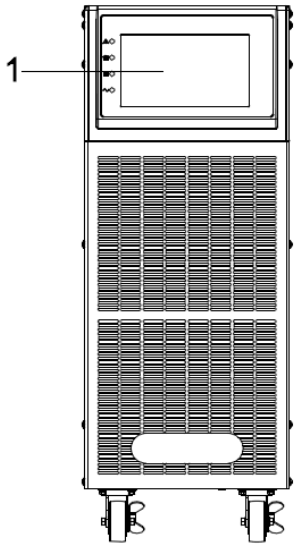
Please transport the UPS system only in the original package to protect against shock and impact.

3.2 Unpacking and moving the UPS

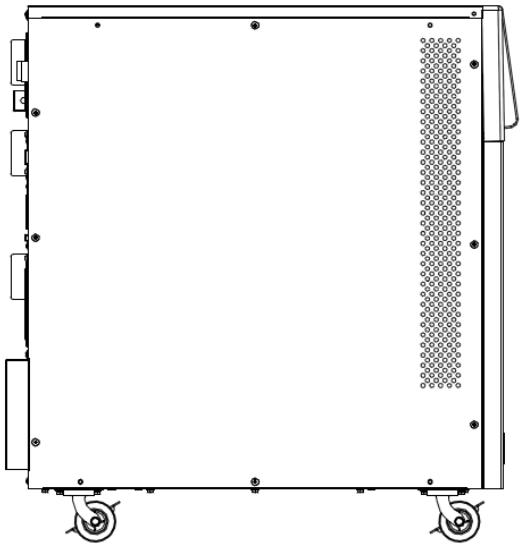
- Use a forklift to move the UPS to the installation area.
- Do not lean the UPS when moving it out from the packaging.
- The castors are designed to move the UPS a short distance on level ground
- Examine the UPS for any damage, do not switch on the UPS if any there is any damage. Contact the supplier right away.
- Check the accessories and contact the supplier if anything is missing.

3.2 Drawings

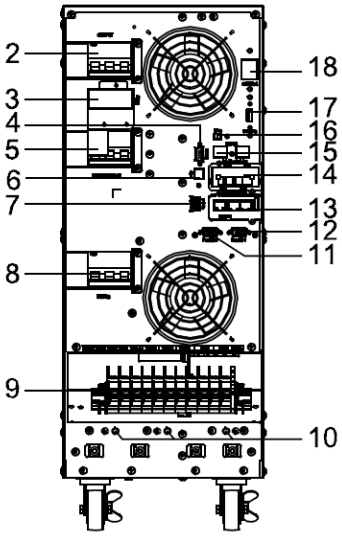
3.2.1 10-40kVA (H)



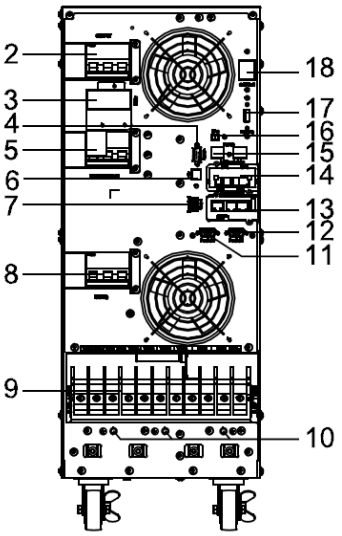
Front View



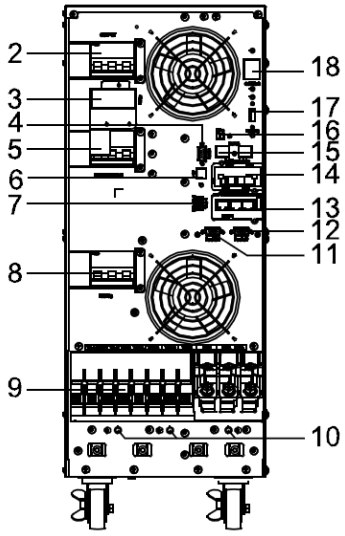
Side View



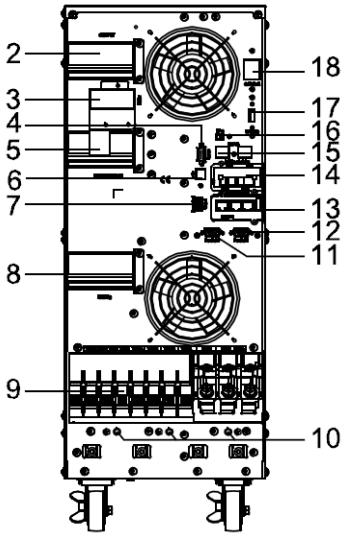
10kVA (H) Rear View
(Terminal block without cover)



15-20kVA (H) Rear View
(Terminal block without cover)



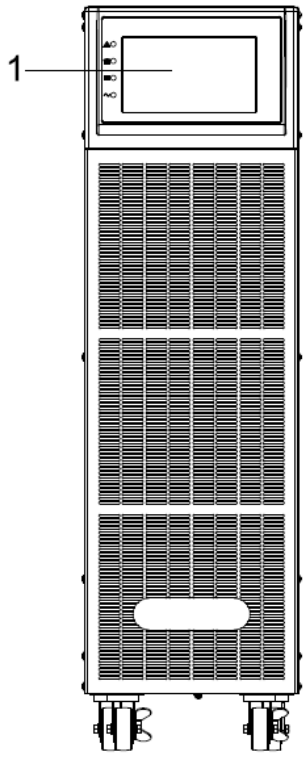
30kVA (H) Rear View



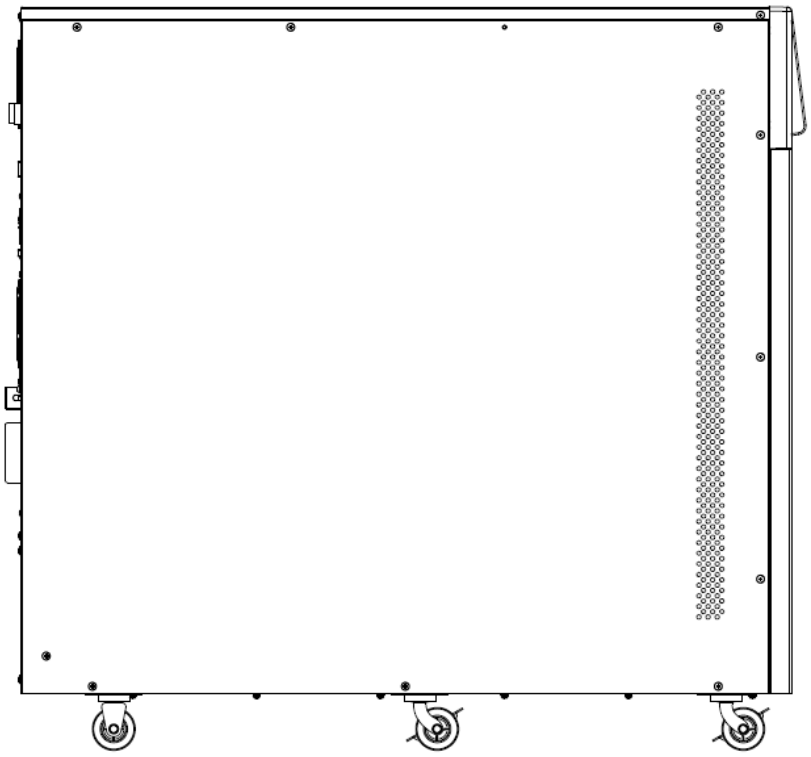
40kVA (H) Rear View

(Terminal block without cover)	(Terminal block without cover)
(1) LCD panel	(2) Output Switch
(3) External maintenance switch signal / Maintenance switch cover plate	(4) RS232 port
(5) Maintenance switch	(6) USB port
(7) Dry contact port	(8) Input Switch
(9) Terminal block for Input, output, battery & Ground (Dual input)	(10) Earth
(11) Parallel port 1	(12) Parallel port 2
(13) Intelligent Slot 2 (SNMP card/ Relay card)	(14) Intelligent Slot 1 (SNMP card)
(15) RS485 port	(16) REPO port
(17) EVENTS port	(18) Cold start button

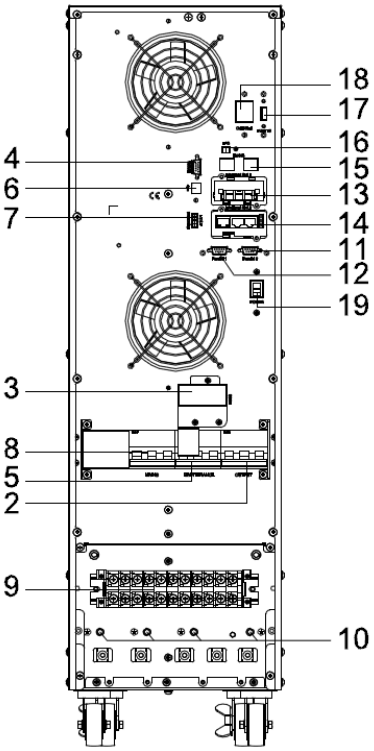
3.2.2 10-40kVA (S)



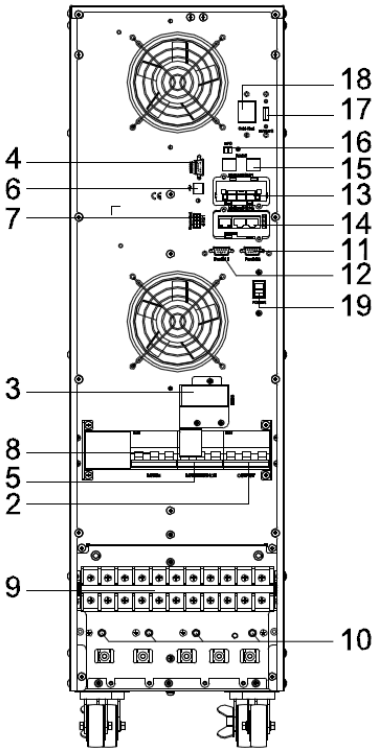
Front View



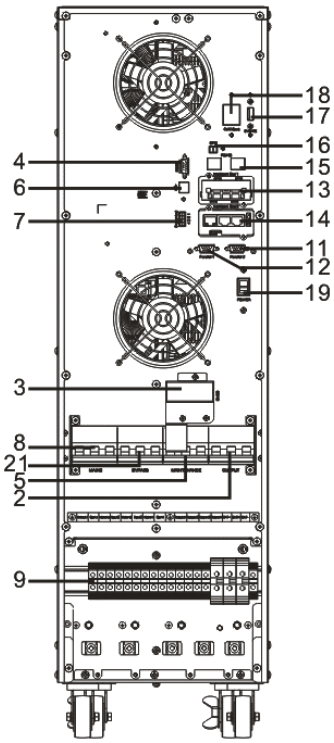
Side View



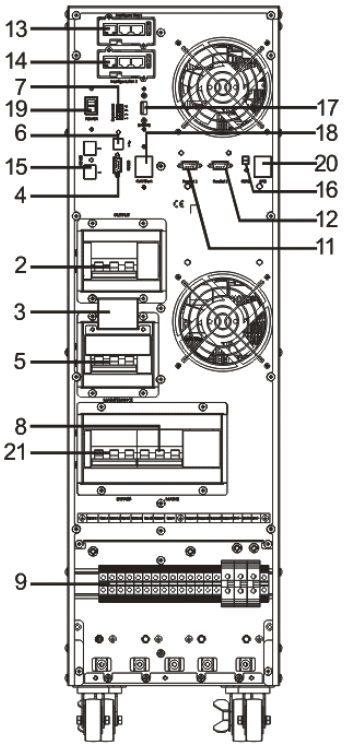
10kVA Rear View
(Terminal block without cover)



15-20kVA Rear View
(Terminal block without cover)



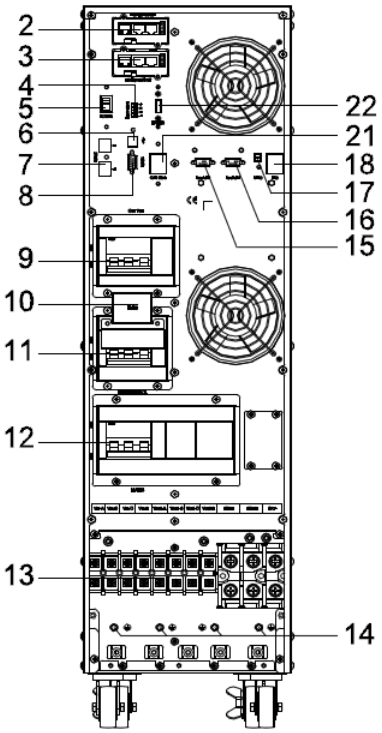
10-20kVA Rear View
(Dual input, terminal block without cover)



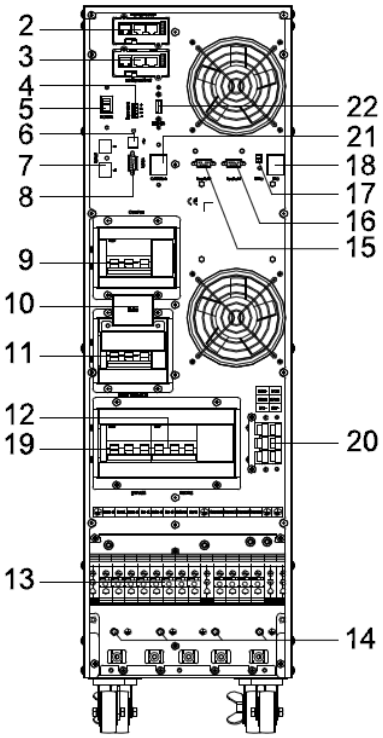
10-20kVA (60pcs optional) Rear View
(Dual input, terminal block without cover)

(1) LCD panel	(2) Output Switch
(3) External maintenance switch signal / Maintenance switch cover plate	(4) RS232 port
(5) Maintenance switch	(6) USB port
(7) Dry contact port	(8) Input Switch
(9) Terminal block for Input, output, battery	(10) Earth

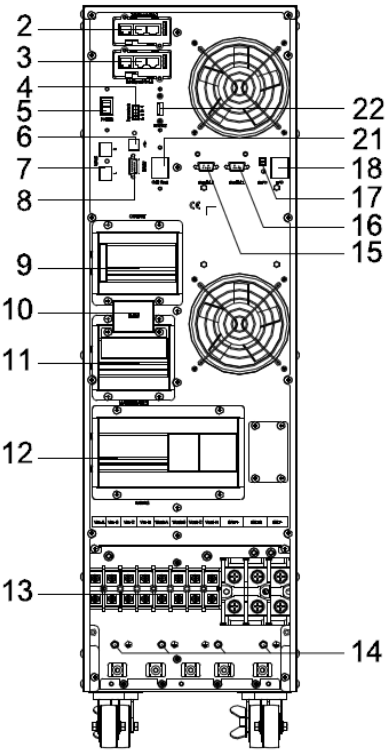
(11) Parallel port 2	(12) Parallel port 1
(13) Intelligent Slot 1 (SNMP card)	(14) Intelligent Slot 2 (SNMP card/ Relay card)
(15) RS485 port	(16) REPO port
(17) EVENTS port	(18) Cold start button
(19) Power Switch	(20) EPO switch
(21) Bypass Switch (Dual input)	



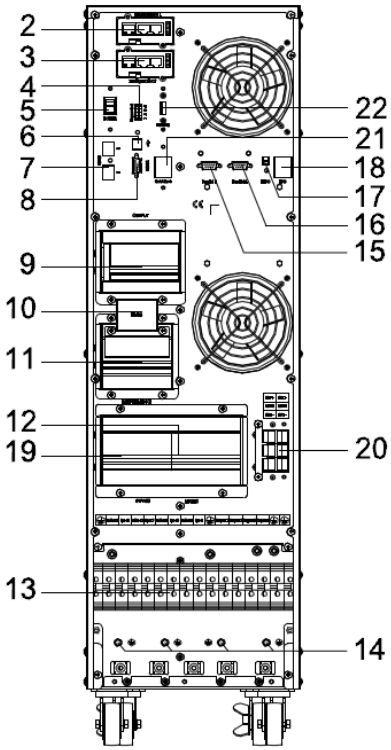
30kVA Rear View
(Terminal block without cover)



30kVA Rear View
(Dual input, terminal block without cover)



40kVA Rear View
(Terminal block without cover)



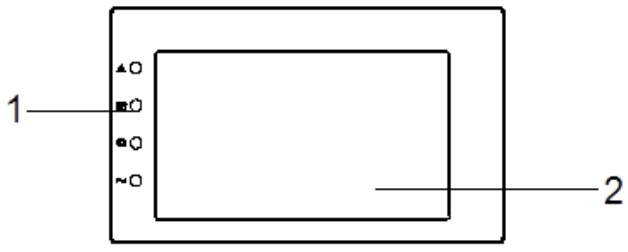
40kVA Rear View
(Dual input, terminal block without cover)

(1) LCD panel	(2) Intelligent Slot 1 (SNMP card/ Relay card)
(3) Intelligent Slot 2 (SNMP card/ Relay card)	(4) Dry contact port
(5) Power Switch	(6) USB port
(7) RS485 port	(8) RS232 port
(9) Output Switch	(10) External maintenance switch signal / Maintenance switch cover plate
(11) Maintenance switch	(12) Input Switch
(13) Terminal block for Input, output, battery (Single input)	(14) Earth
(15) Parallel port 2	(16) Parallel port 1
(17) REPO port	(18) EPO switch
(19) Bypass Switch (Dual input)	(20) battery (Dual input)
(21) Cold start button	(22) EVENTS port

3.3 Installation environment

- For operation, maintenance, and ventilation we recommend leaving 100cm at the front of the unit and 80cm at the back.
- The UPS system must be dry before being installed
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near a heater.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Do not block ventilation holes in the UPS housing.
- Do not connect appliances or devices which would overload the UPS system to the UPS output sockets.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.
- Place cables in such a way that they cannot be stepped on or tripped over.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.

3.3 LCD control panel



LCD control panel introduction

LED from top to bottom: “alarm”, “bypass”, “battery”, “inverter”

3.4 Installation notes

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

◆Place the UPS in a clean dry environment, avoid the dust, humidity, flammable gas and corrosive liquids. Avoid high temperatures and use appropriate ventilation such as fans or aircons where necessary. Optional air filters are available if the UPS operates in a dusty environment.

◆The temperature around UPS should ideally not exceed 40℃. If the temperature does exceeds 40℃, the rated load capacity will decrease by 12% for every 5℃. The max temperature cannot exceed 50℃.

◆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 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 dry cool conditions.

CAUTION!

Shelf life of batteries not being charged is 6 months.

◆The UPS is designed to operate normally to a maximum altitude of 1500m. If the UPS operates at higher altitudes, its capacity will reduce as follows:

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

◆The UPS cooling is dependent on fans and should therefore be kept in well ventilated area. Ventilation flows from front to the rear of the UPS and should not be obstructed.

3.5 External Protective Devices

For safety reasons, the AC input and battery should be protected by appropriate circuit breakers and be installed by a qualified electrician.

◆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 should be fitted with protective devices that may avoid the risk of UPS overloaded.

3.6 Power Cables

◆The cable size should comply with local regulations. Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support) .

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.

◆Cable guide:

UPS cabinet	Cable Size			
	AC Input (mm^2)	AC Output (mm^2)	DC Input (mm^2)	Earth (mm^2)
10kVA	4	4	10	4
15kVA	6	6	16	6
20kVA	8	8	20	8
30kVA	12	12	35	8
40kVA	16	16	35	10

CAUTION!

Earth each UPS cabinet including the battery boxes.

WARNING!

Failure to follow adequate earthing procedures may result in electromagnetic interference or electric shock.

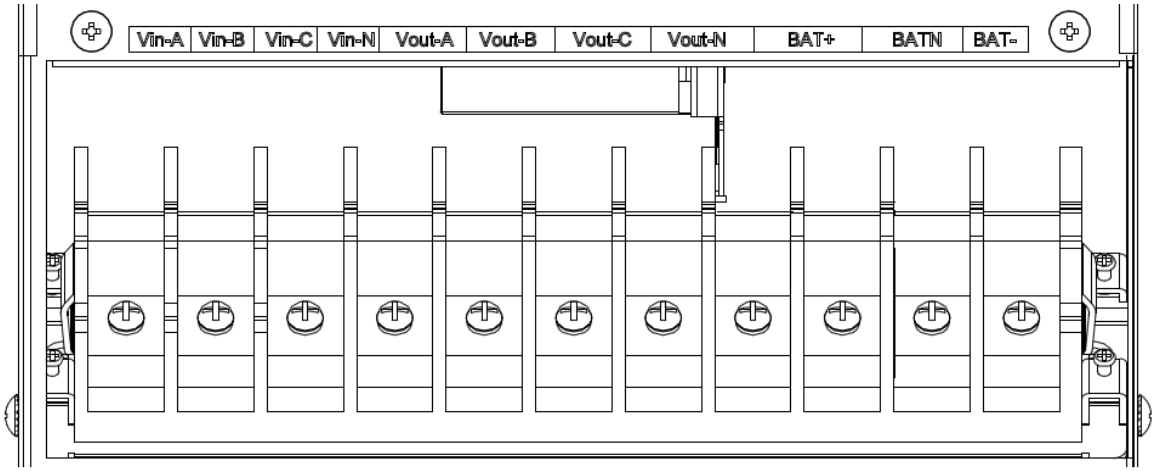
3.7 Connecting the UPS

Once the UPS has been positioned and secured, connect the power cables as described in the here.

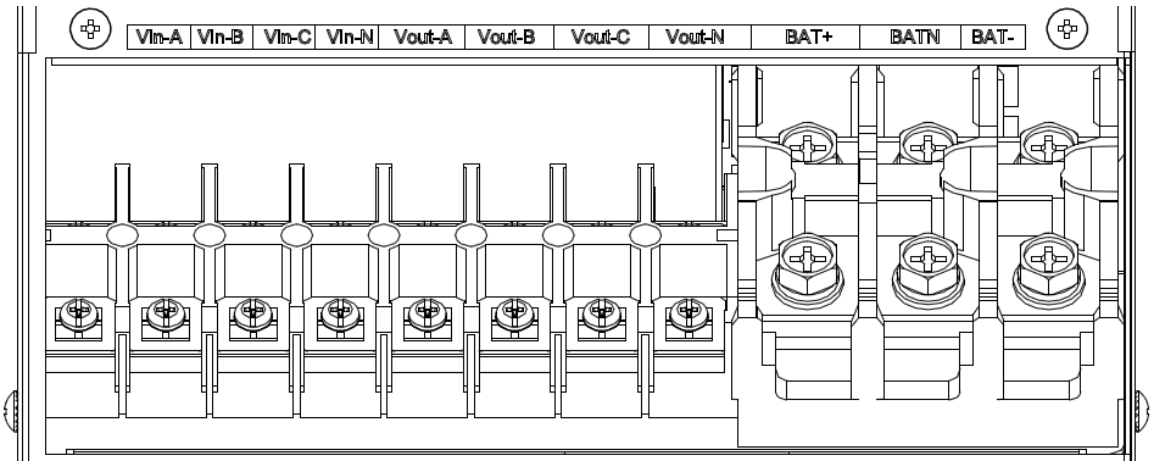
Verify the UPS is totally isolated from its external power source and also all breakers of the UPS are open. Remove the cover of terminals.

Single supply:

10-20kVA



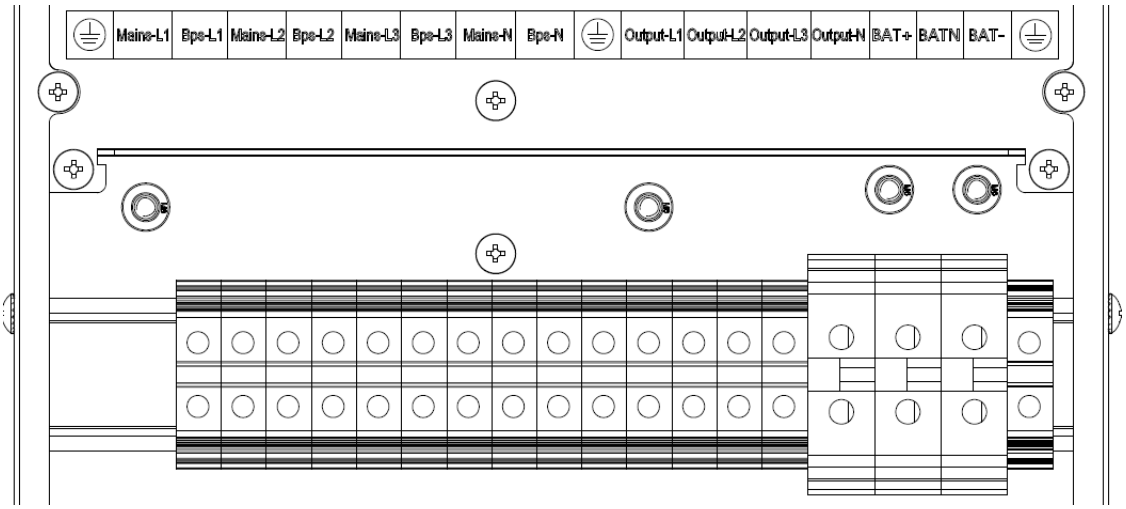
30-40kVA



Terminal sequence from left to right: Input phase A(L1), input phase B(L2), input phase C(L3), input Neutral line, output phase A(L1), output phase B(L2), output phase C(L3), output Neutral line, battery positive, battery Neutral line, battery negative. There are 3 EARTH connectors under the terminal block.

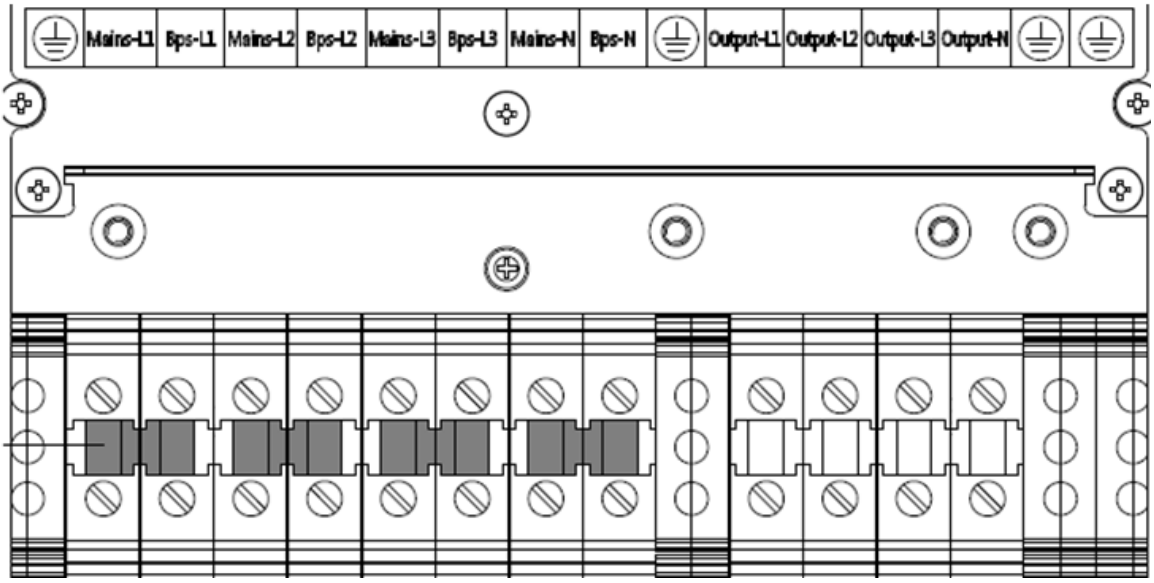
Dual supply:

10-20kVA



Terminal sequence from left to right: EARTH, Input phase A(L1), Bypass phase A(L1), Input phase B(L2), Bypass phase B(L2),Input phase C(L3), Bypass phase C(L3), Input Neutral line, Bypass Neutral line, GROUND, Output phase L1, Output phase L2, Output phase L3,Output Neutral line, battery positive, battery Neutral line, battery negative, EARTH.

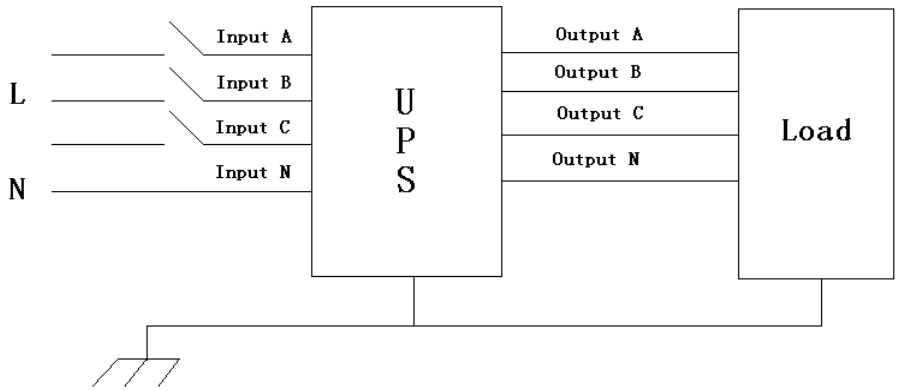
30-40kVA



Terminal sequence from left to right: EARTH, Input phase A(L1), Bypass phase A(L1), Input phase B(L2), Bypass phase B(L2), Input phase C(L3), Bypass phase C(L3), Input Neutral line, Bypass Neutral line, GROUND, Output phase L1, Output phase L2, Output phase L3,Output Neutral line, 2 x EARTH terminals.

Warning!

When using “Dual input” operation, remove the bridges between the different inputs. The AC input and the AC bypass supplies must be referenced to the same neutral point.



WARNING!

If the load equipment is not ready while being commissioned, ensure that the system output cables are safely isolated.

Connect the EARTH cable and any necessary bonding EARTH cables to the copper earth screw located near the terminals. All cabinets in the UPS must be EARTH properly.

CAUTION!

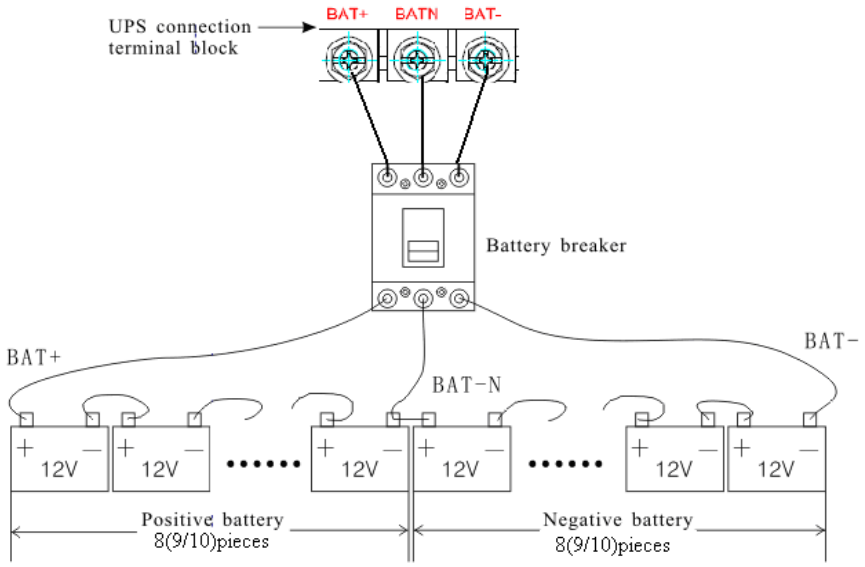
The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.8 Battery connection

10-30kVA:

The UPS adopts Positive and Negative double battery framework, 16 x 12V batteries (optional 18/20) in series. A Neutral cable is retrieved from the point between the cathode of the 8th (9th/10th) and the anode of the 9th (10th/11th) of the batteries called the Neutral cable. The battery Positive and Negative are connected to the UPS respectively. The battery group between the Positive and the Neutral are called positive group where the group between Neutral and Negative are called Negative group. The quantity of batteries used in each group are determined by the desired run time.

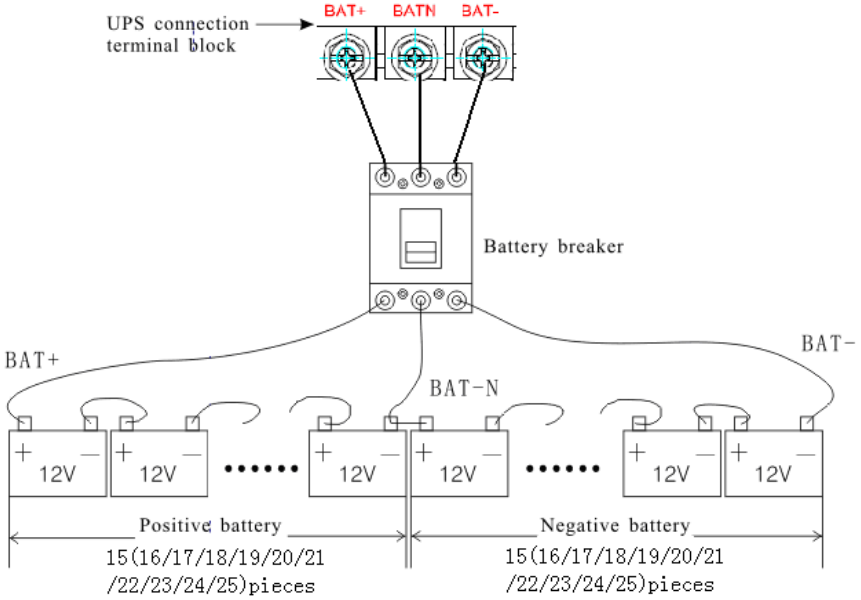
External battery connections for long-run units.



40kVA / 10-30kVA (Optional):

The UPS adopts Positive and Negative double battery framework, 30 x 12V batteries (optional 32/34/36/38/40/42/44/46/48/50) in series. A Neutral cable is retrieved from the joint between the cathode of the 15th (16th/17th/18th/19th/20th/21st/22th/23th/24th/25th) and the anode of the 16th (17th/18th/19th/20th/21th/22th/23th/24th/25th/26th) of the batteries called the Neutral cable. The battery Positive and the battery Negative are connected to the UPS respectively. The battery group between the battery Positive and the Neutral are called positive group and the group between neutral and Negative are called Negative group. The quantity of batteries used in each group are determined by the desired run time.

External battery connections for long-run units.



Note：

The BAT+ terminal on the UPS connects to the Positive on the battery. The BAT-N connects to the Neutral of the battery and BAT- is connected to the Negative of the battery.

10-30kVA factory setting of the long-run unit is battery quantity---16 x 12V batteries. (charger current 6A). When connecting 18/20 batteries, please re-set desired battery quantity and its capacity while commissioning. Charger current is adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software

40kVA factory setting of the long-run unit is battery quantity---30 x 12V batteries. (charger current 6A). When connecting 32/34/36/38/40/42/44/46/48/50 batteries, please re-set desired battery quantity and its capacity while commissioning. Charger current is adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software

CAUTION!

Ensure correct battery polarity. I.e., inter-tier and inter block connections are from (+) to (-) terminals.
Don’t mix batteries with different capacity, different brands, or different age batteries.

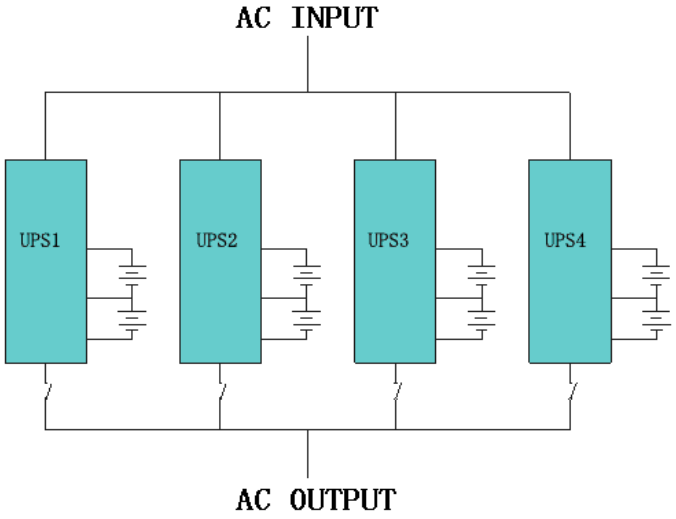
WARNING!

Ensure correct polarity of each group from battery to circuit breaker and again from circuit braker to the UPS. Do not connect batteries to UPS and do not close the battery circuit breaker unless authorized by the commissioning engineer

3.9 UPS parallel Installation

3.9.1 Cabinet installation

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



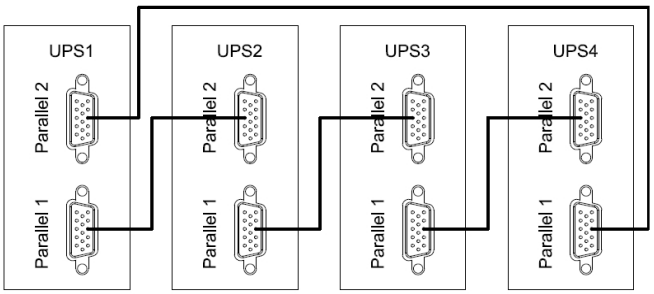
Make sure each UPS input and output breaker is in “off” position and there is none of the outputs are connected to each other. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and common battery.

WARNING!

Make sure the N, A (L1), B (L2), C (L3) lines are corrected, and EARTHING 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.

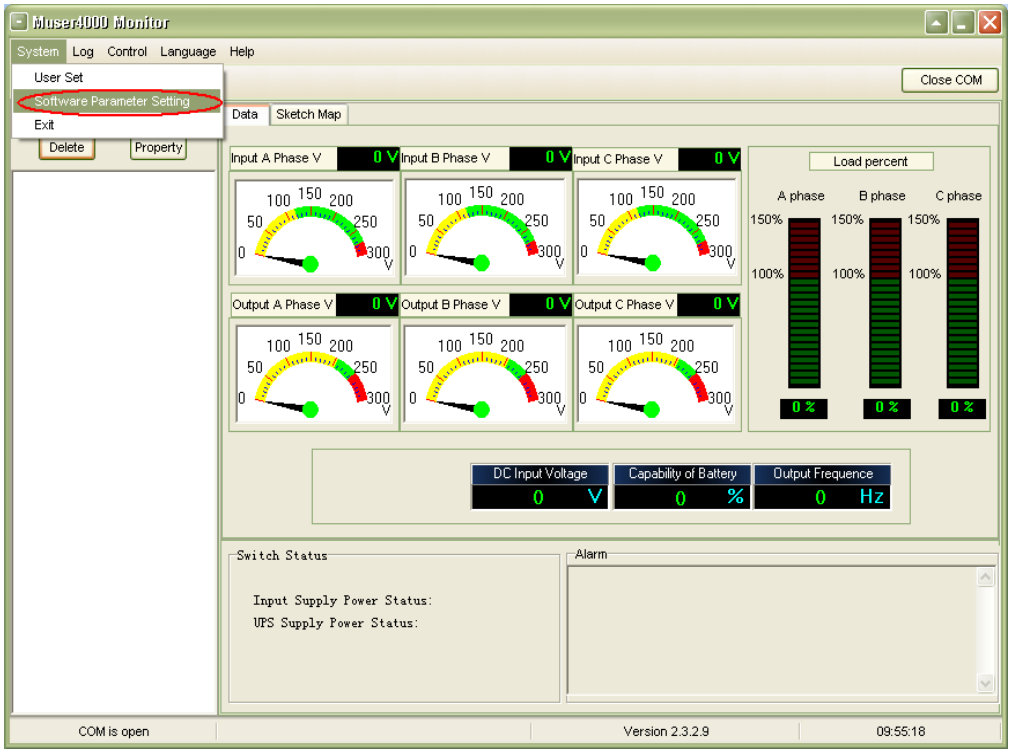
2) The outputs of all the UPS must be connected to a common output bus.

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.

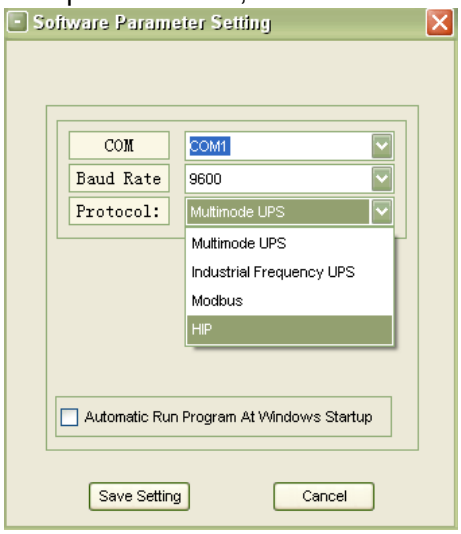
3.10 Computer access

◆Insert the USB cable into the USB port on the rear of the UPS

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

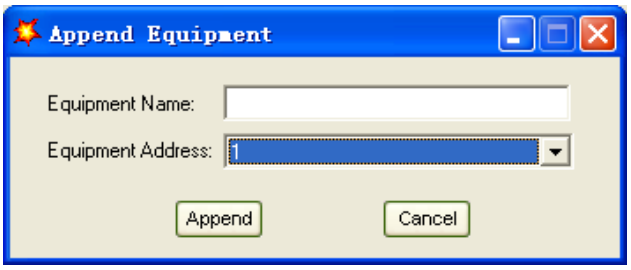


◆A window of “Software Parameter Setting” displays as below, set PC COM port accordingly, baud rate choose 9600, choose protocol “HIP”, then save this setting.



◆On the main page of Muser4000, click “Append”, then it will revert to “Append equipment”.

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



◆Click “Append” again to finalize the connection between the UPS and PC

CAUTION!

To change the UPS output voltage and frequency, make sure the inverter is switched off.

4. Operation and maintenance

4.1 Operation of UPS

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets, or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- To fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent fluids or other foreign objects from inside of the UPS system.

4.1 Maintenance, service, and faults

Caution-risk of electric shock. Repairs may only be carried out only by qualified maintenance personnel.

Caution-risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.

- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present, and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.

Caution-risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!

Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:

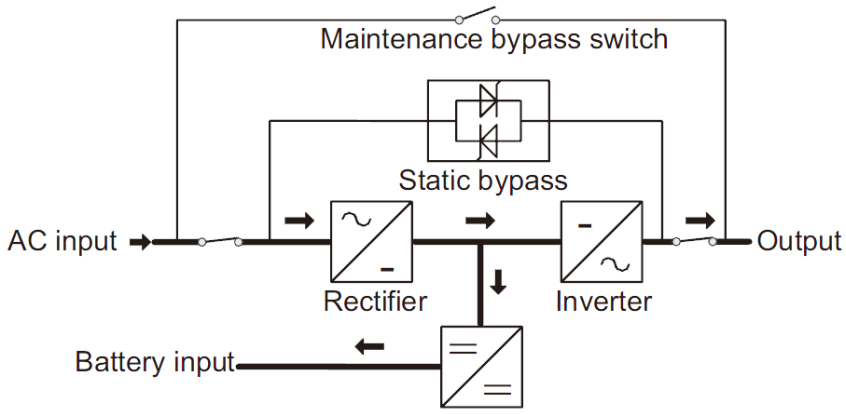
- Remove wristwatches, rings, and other metal objects
- Use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage to avoid fire hazards.
- Do not dismantle the UPS system.

4.1 Operation Modes

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

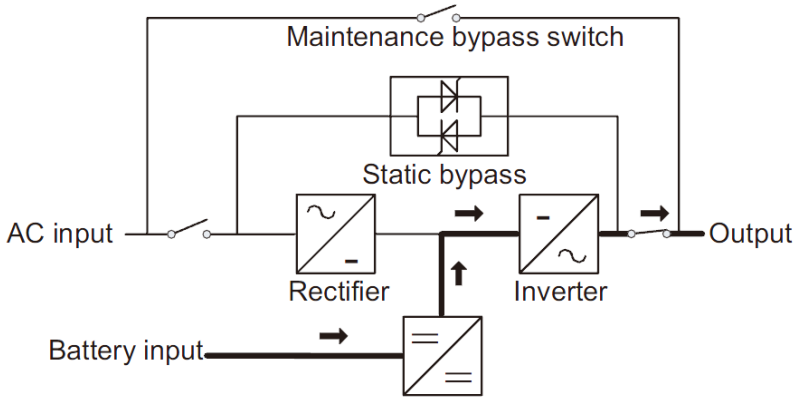
◆Normal mode

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



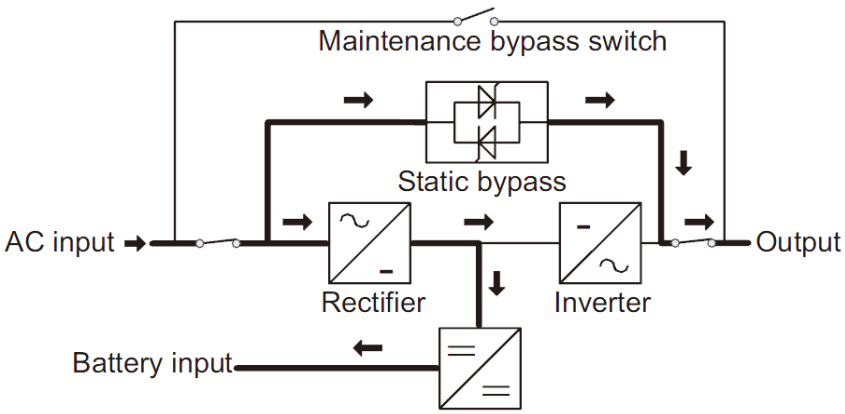
◆Battery mode (Stored Energy Mode)

If the AC mains 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.



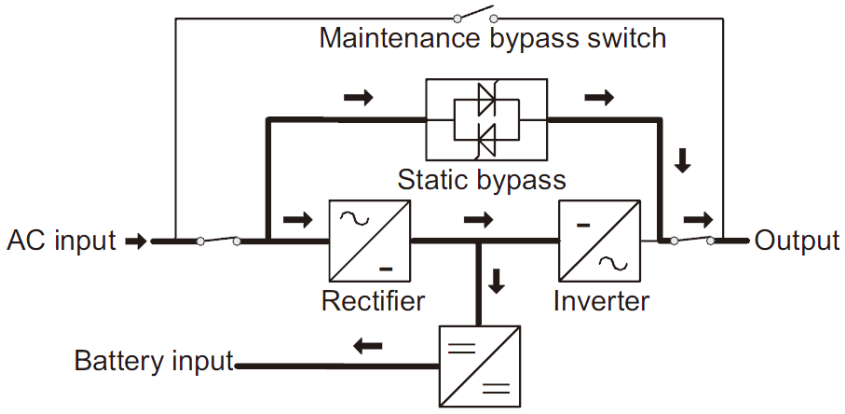
◆Bypass mode

If the inverter is out of order, or overloaded, the static transfer switch will be activated to transfer the load from the inverter supply to bypass seamlessly. 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 an interruption. 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 20ms (50Hz)



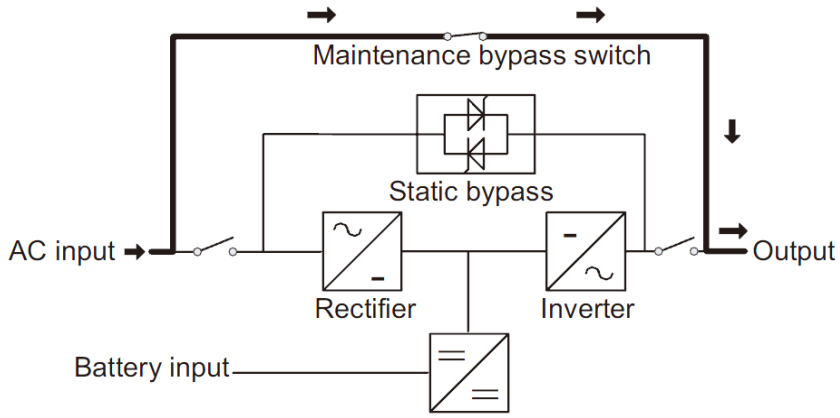
◆ECO Mode

When AC is present and the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency. During ECO mode, the UPS works at Line-interactive UPS, operating normally through the bypass. When the AC drifts out of set perameters, the UPS will transfer from bypass to Inverter and supplies power from the battery.



◆Maintenance mode (Manual Bypass)

A manual bypass switch is supplied to ensure continuity of supply to the critical load when the UPS is out of order or being serviced/repaired.



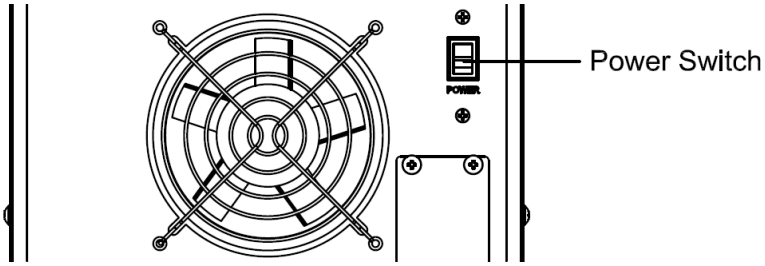
4.2 Turning on/off UPS

4.2.1 Restart procedure

CAUTION!

Make sure Earthing is properly done!

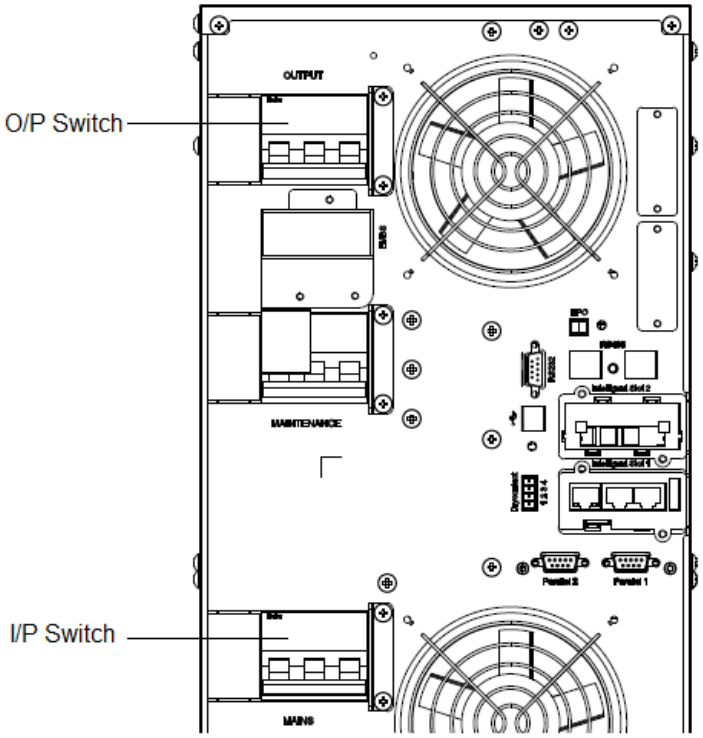
- ◆ Set the Battery Breaker to the “ON” for long run UPS.
- ◆ Switch ON the power switch for standard UPS.



CAUTION!

Check to see if the load is safely connected to 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

◆ Switch ON UPS input switch



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

◆ Switch ON UPS output switch

If the rectifier fails at startup, the bypass LED will light up. When the inverter starts, the UPS will transfer from bypass mode to inverter mode, this can be seen by the LEDs.

The status of the UPS is clearly shown on the LCD display.

4.2.2 Test procedure

CAUTION!

While UPS is operating normally. It may take 60 seconds for UPS to start 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 illuminate.

◆ Switch on the MAINS to simulate AC recovery, the rectifier will restart automatically after

20 seconds and the inverter will continue to 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 5; otherwise, jump to Step 4.

◆ Open the cover of maintenance switch, the UPS will turn to bypass mode automatically.

◆ Turn on MAINTANCE breaker;

◆ Switch OFF BATTERY breaker;

◆ Switch OFF the MAINS 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

◆ Switch ON the output breaker.

◆ Switch ON the input 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.

◆ Replace 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!

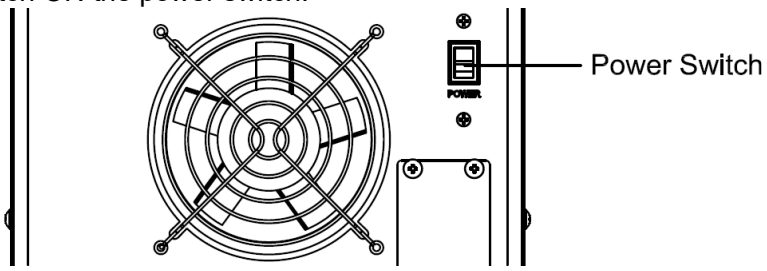
Follow these procedures when the input AC Utility Failure, but battery is normal

◆ Set the Battery Breaker to the “ON” for long run UPS.

◆ Switch ON the power switch for standard UPS.

◆ Turn on the Output switch.

◆ Switch ON the power switch.



◆ Push the cold start button.

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

CAUTION!

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

4.2.5 Shuting 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.

On-line mode:

◆ Switch inverter off in the status screen, wait about 30s.

◆ Switch OFF the BATTERY breaker for long run UPS. Open the battery power switch for standard UPS.

◆ Switch OFF the input breaker.

◆ Switch OFF the OUTPUT breaker. The UPS shuts down.

◆ To completely isolate the UPS from AC Mains, all input switches should be switched off.

Battery mode:

◆Switch inverter off in the status screen, wait about 30s.

◆ Switch OFF the BATTERY breaker for long run UPS. Open the battery power switch for standard UPS.

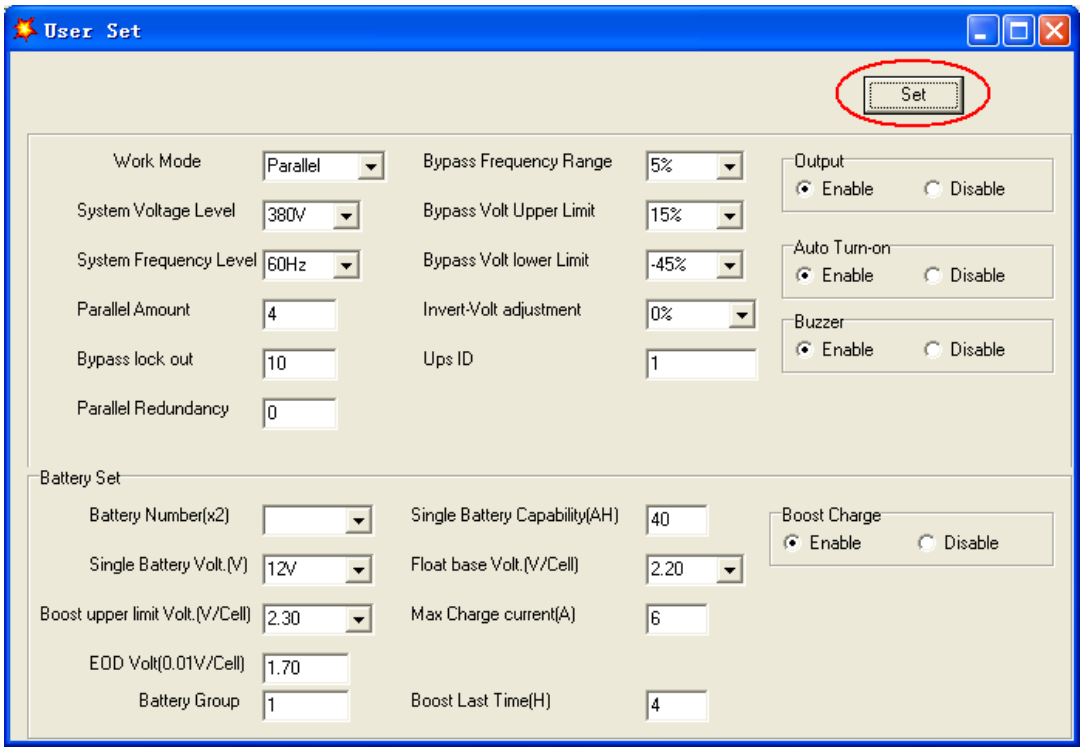
◆ Switch OFF the OUTPUT breaker. The UPS shuts down.

4.2.6 Parallel setting

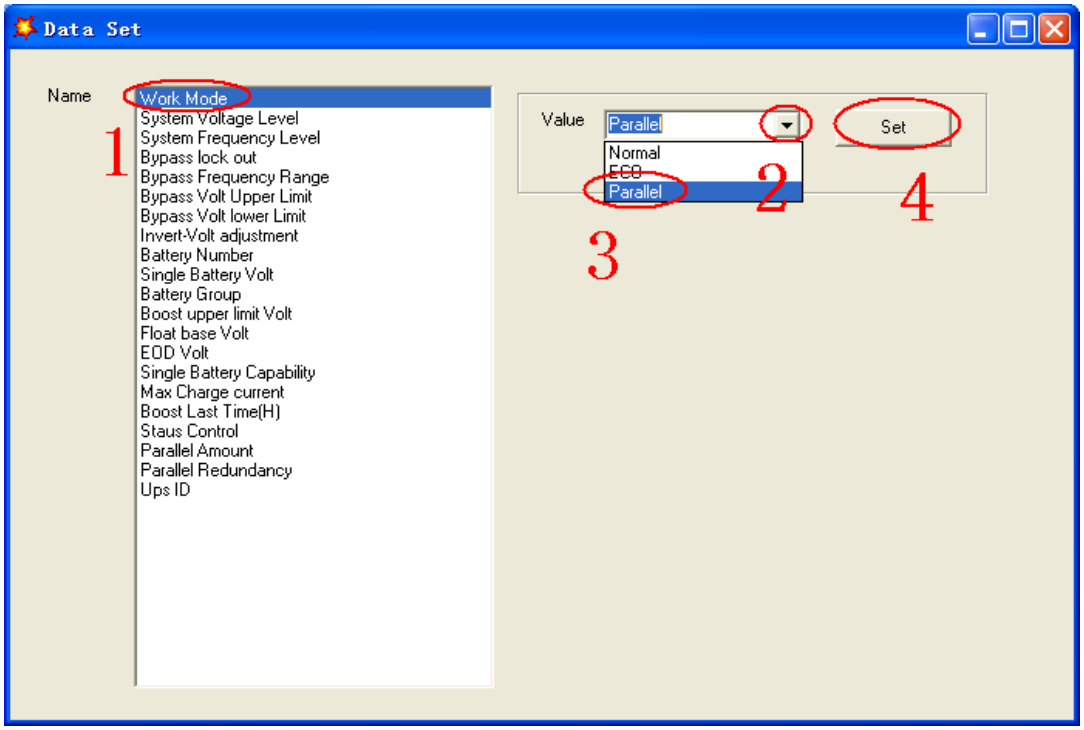
◆Connect the UPS to the computer. Power on the UPS.

◆ Open Muser4000 software, after connecting with the UPS successfully, click "System"->"User Set"

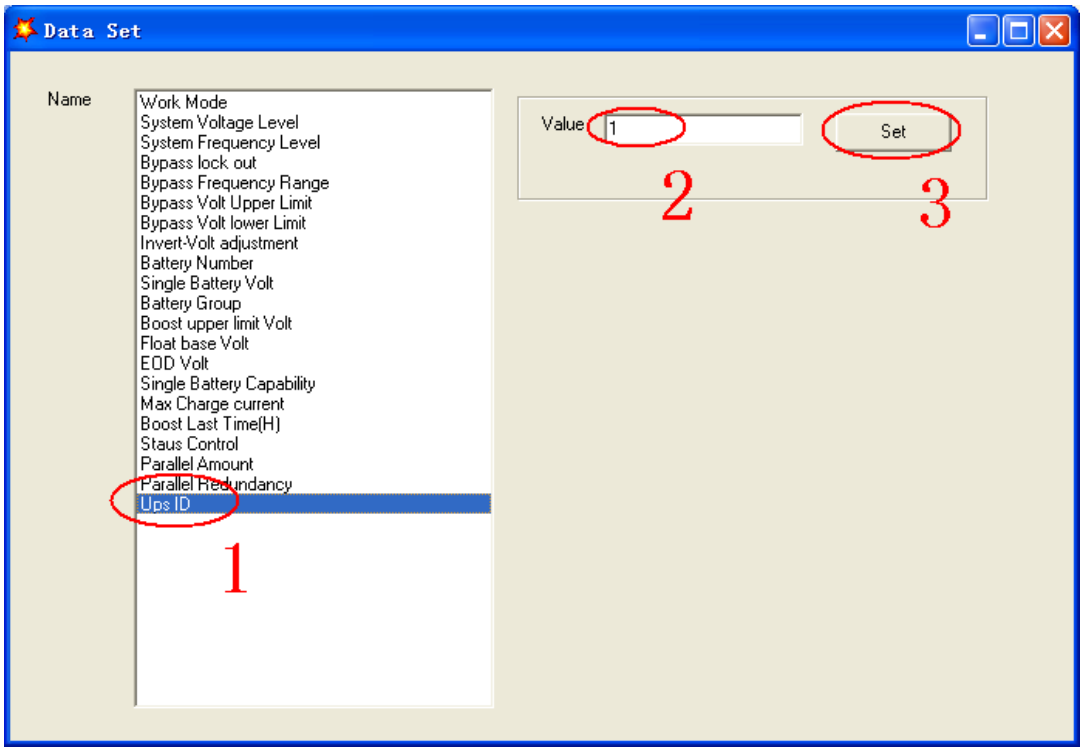
◆Click "Set" at "User Set" window;



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



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



CAUTION!

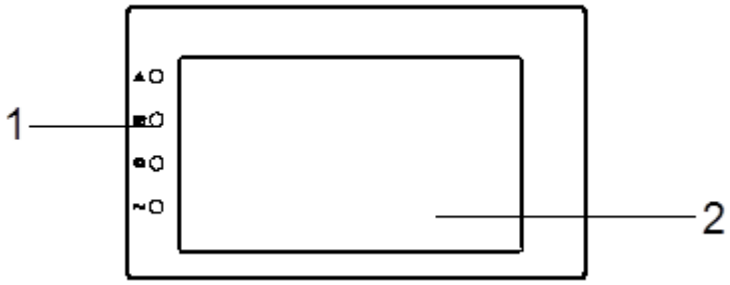
After changing the parallel system ID, the connection between Muser4000 and equipment might be interrupted. If it occurs, please re-connect in accordance with the instruction described before.

CAUTION!

Parallel cable cannot be connected when setting the parallel parameters.

◆After setting the UPS to parallel, 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")

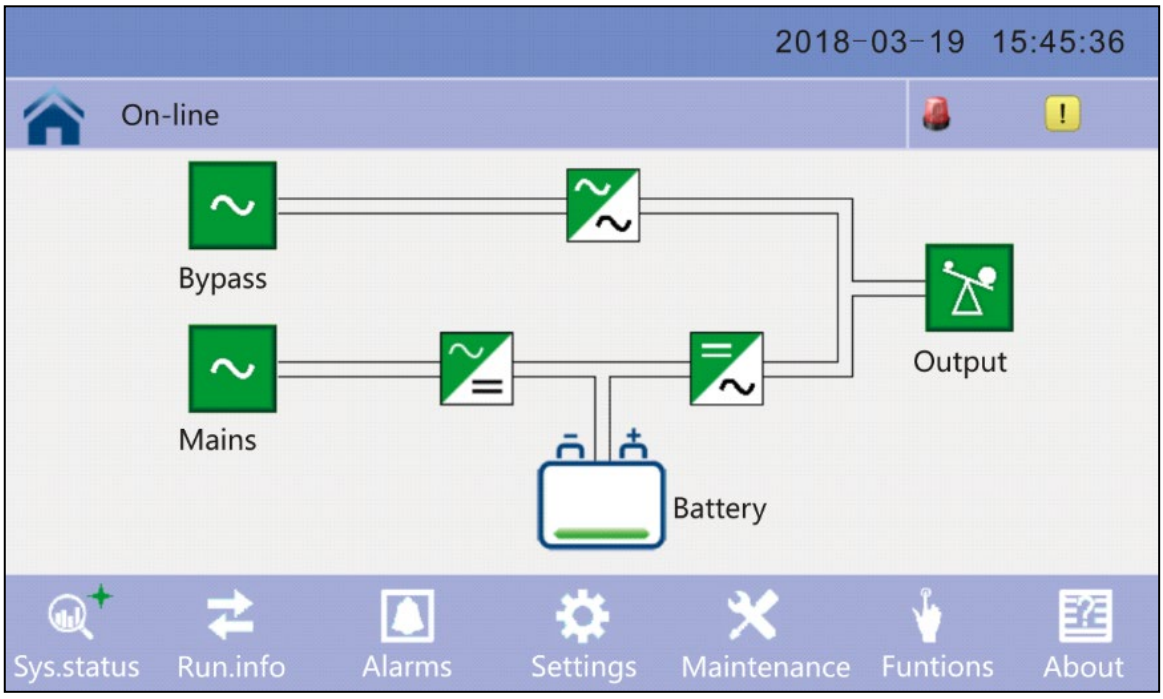
(2) LCD display

Introduction

CAUTION!

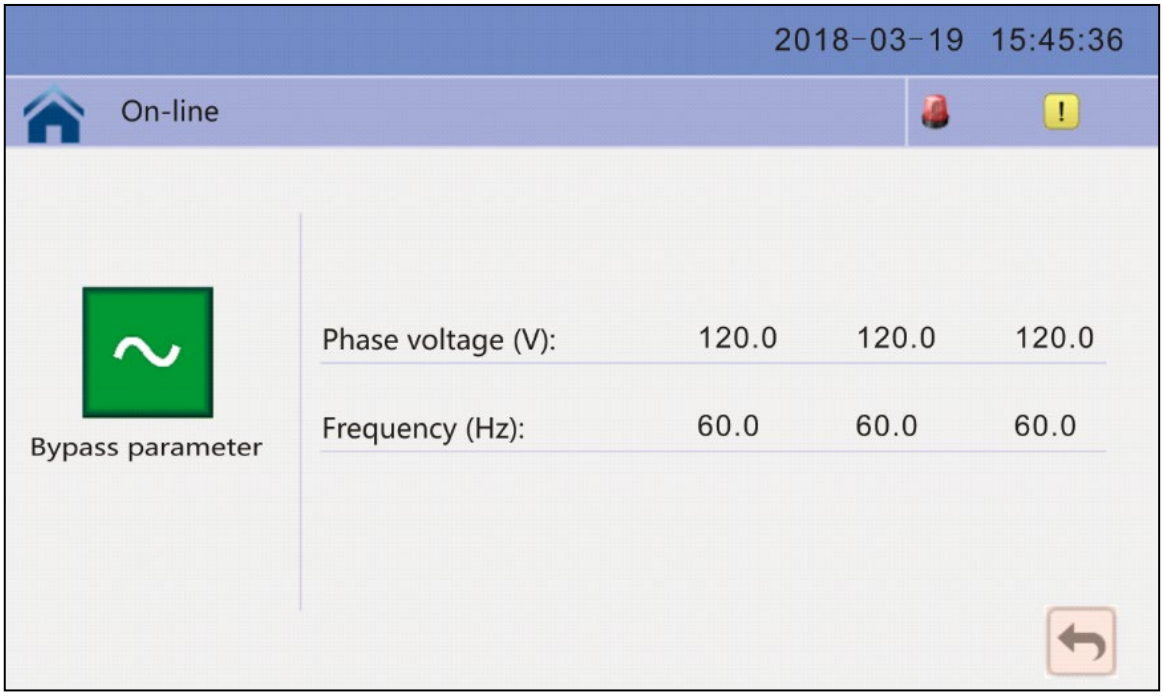
The display provides more functions than those described in this manual.

4.3.1 Home page 1, shows the UPS operating flow chart, with data input, output, battery.

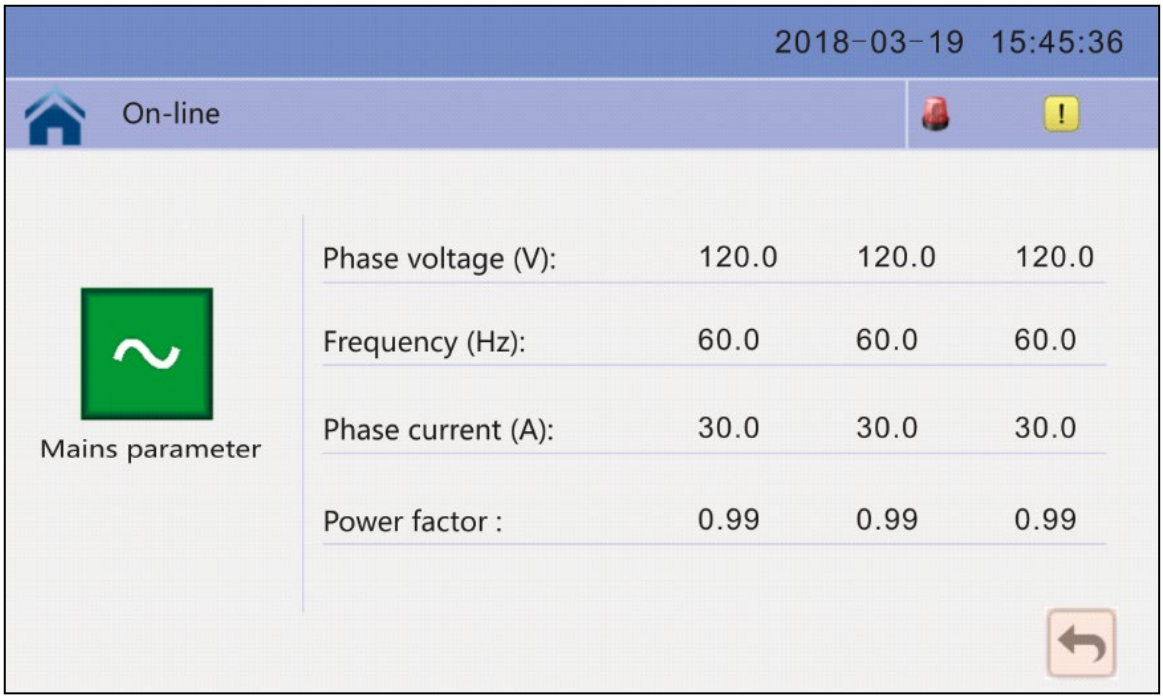


1) Click on the bypass icon to enter the bypass data screen, click on the back icon return to last

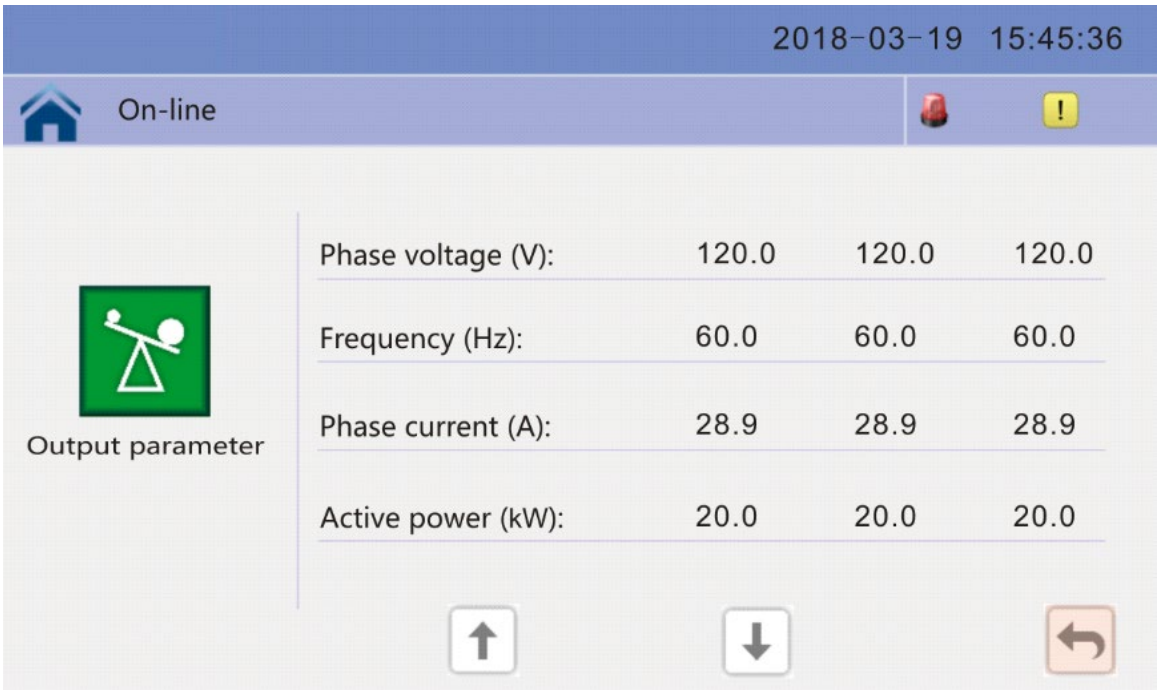
screen and click on the homepage icon jump to main page.



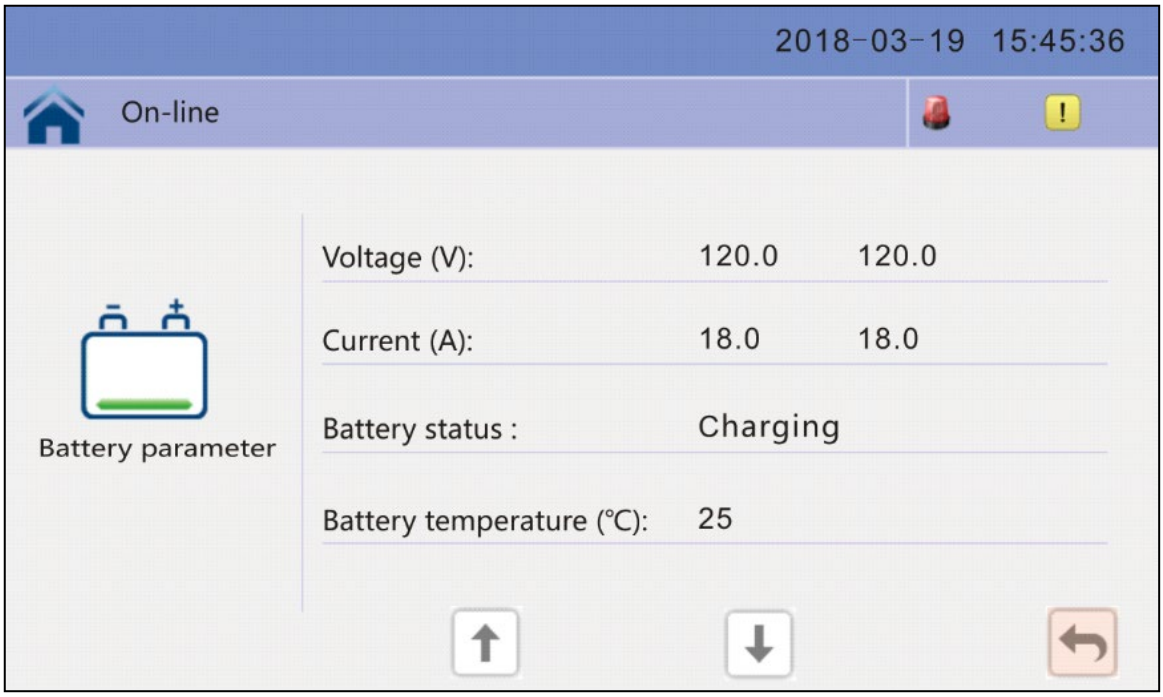
2) Click on the mains icon to enter the mains data screen, click on the back icon to return to last window and click on the homepage icon jump to main page.



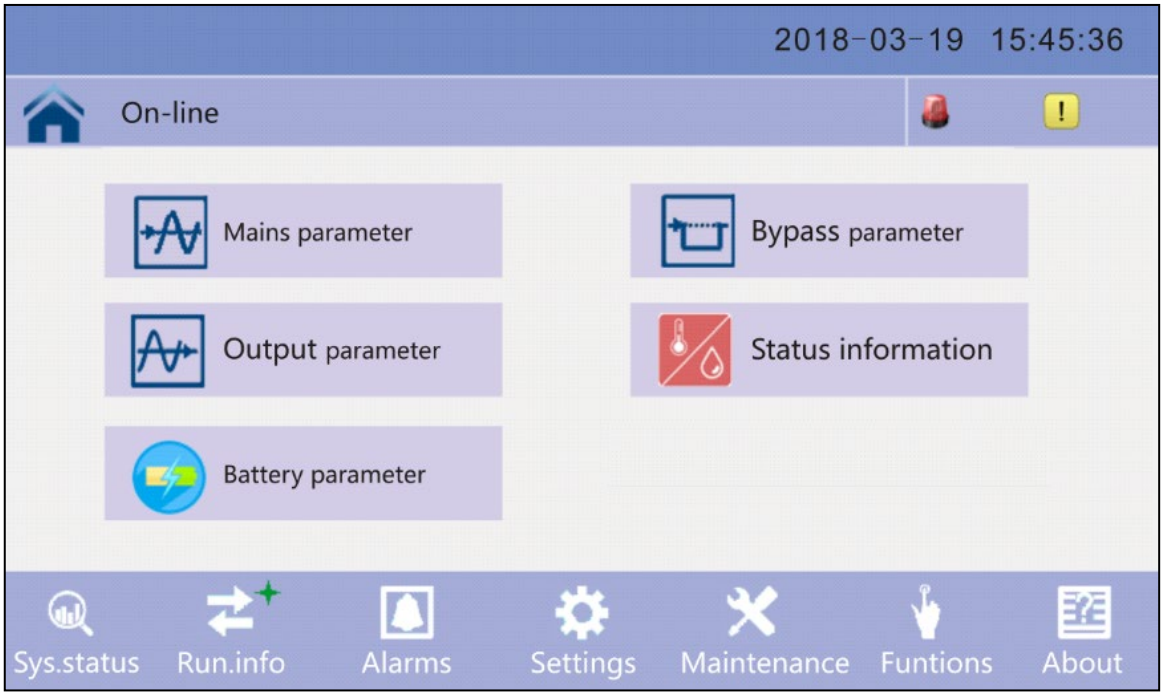
3) Click on the Load icon to enter the output data screen, click on the back icon to return to last screen and click on the homepage icon jump to main page.



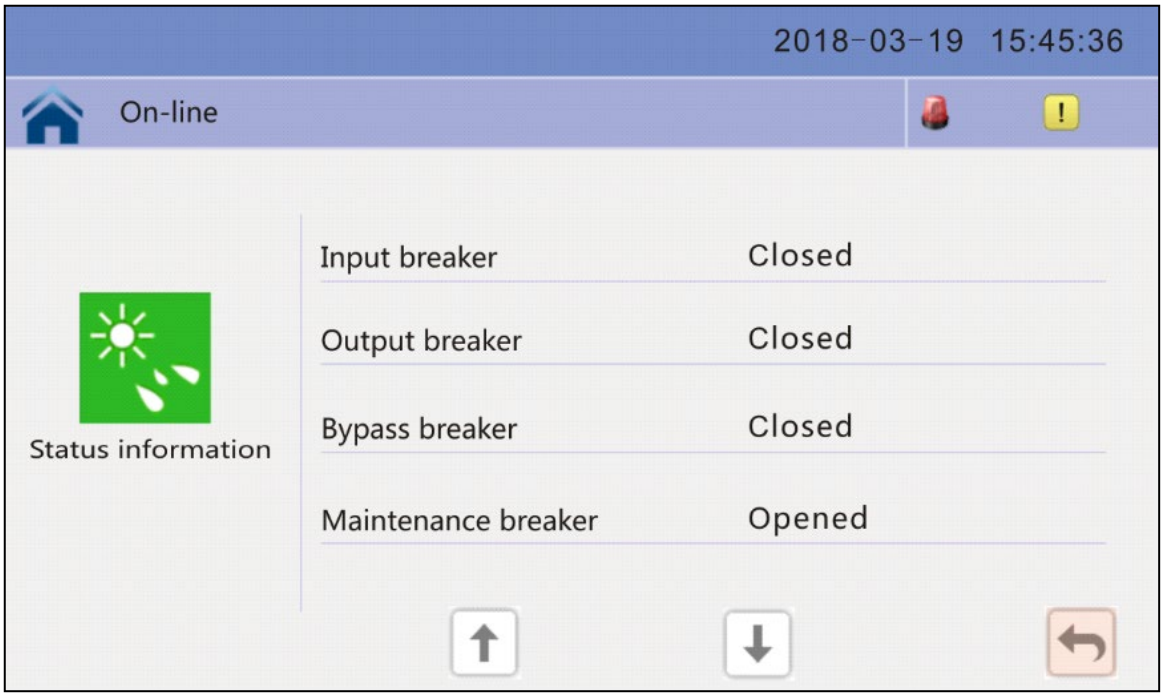
4) Click on the battery icon to enter the battery data screen, click on the back icon to return to last screen and click on the homepage icon jump to main page.



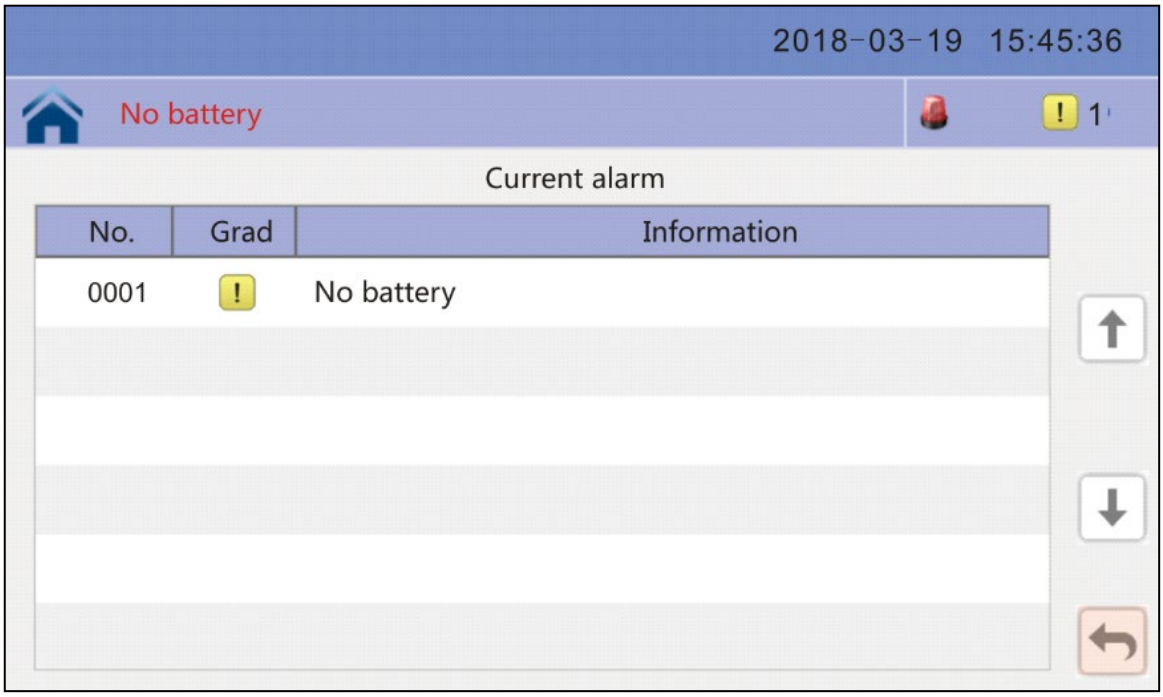
4.3.2 Click on Run icon to enter the information page.



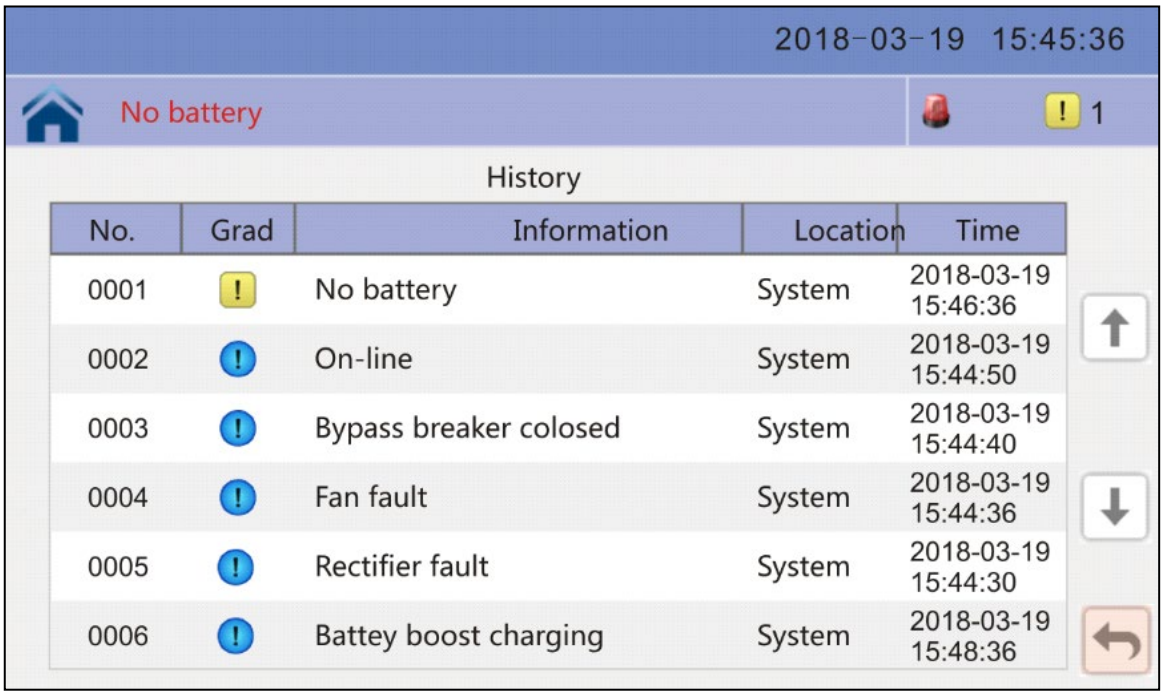
1) Click on the Run time icon to enter the status data screen, this shows the breaker status, click on the back icon to return to last window and click on the homepage icon jump to main page.



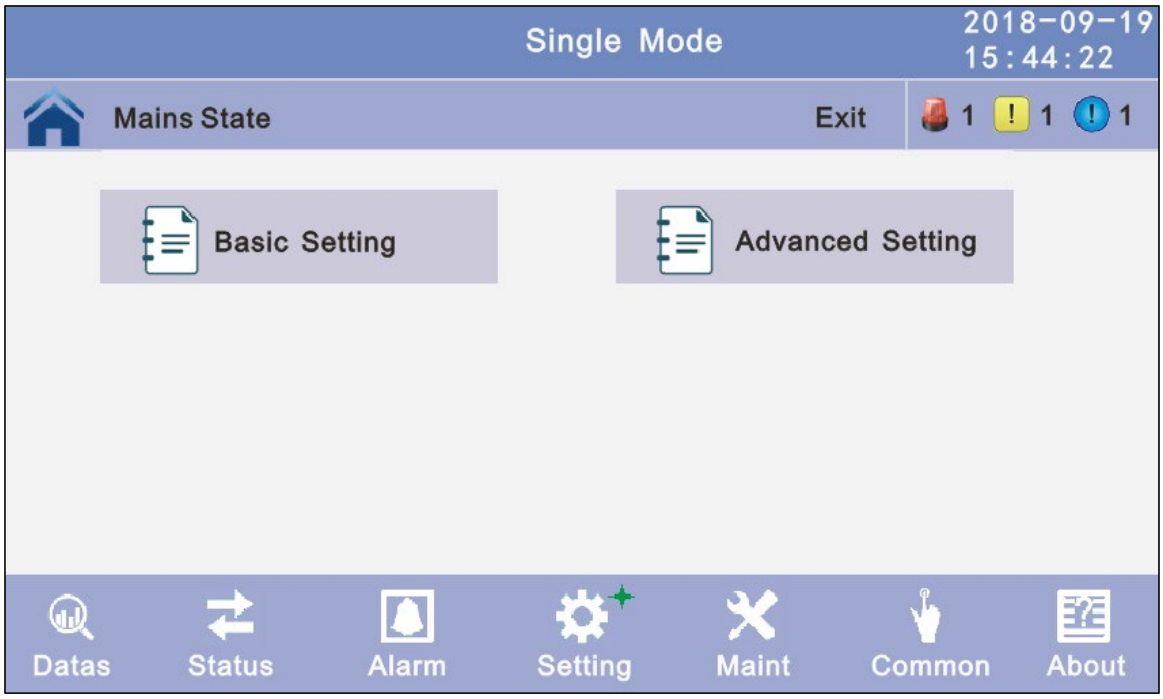
1) Click on the active Alarm icon to enter the module data screen, this indicates the alarm data, click on the back icon return to last screen and click on the homepage icon jump to main page.



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

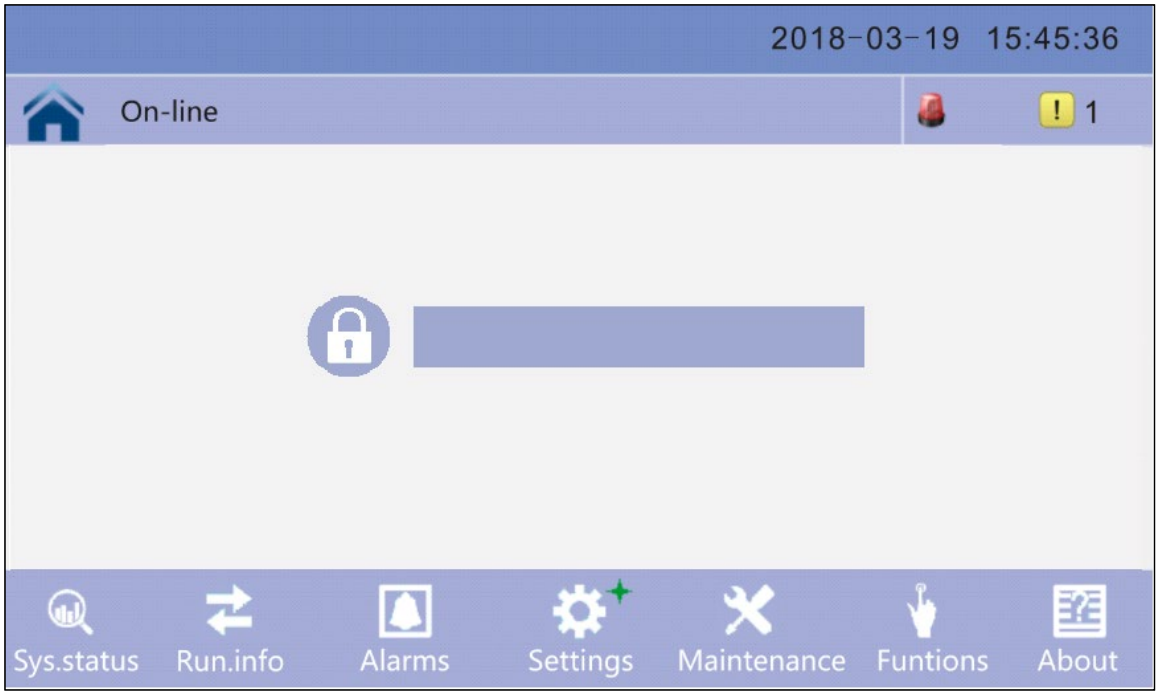


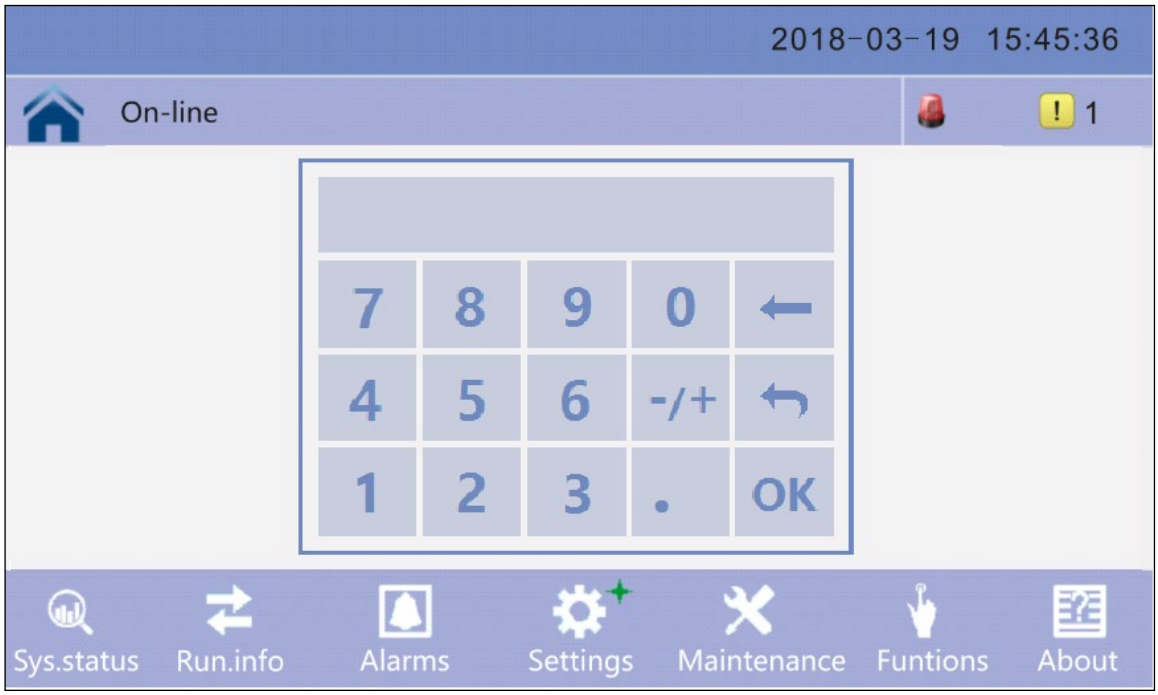
4.3.4 Click on setting icon to enter setting screen, click on the back icon return to last window and click on the homepage icon jump to main page



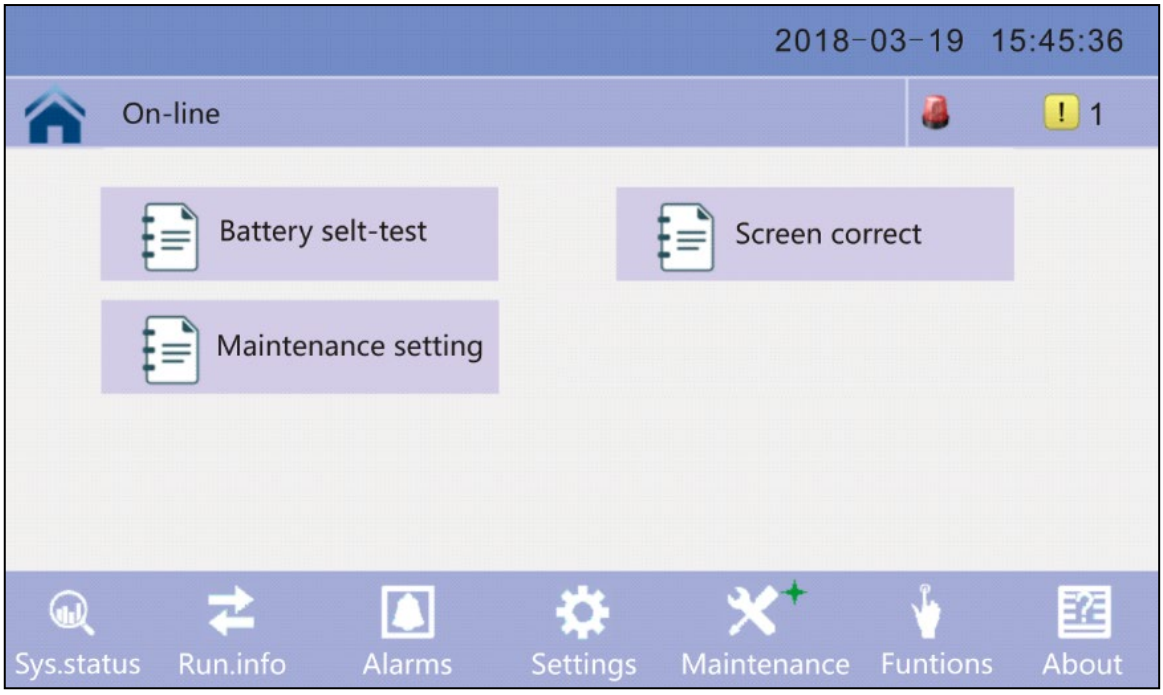
4.3.5 Click advanced setting, enter by input the correct password.

Note: This operation is recommended for maintenance personal only

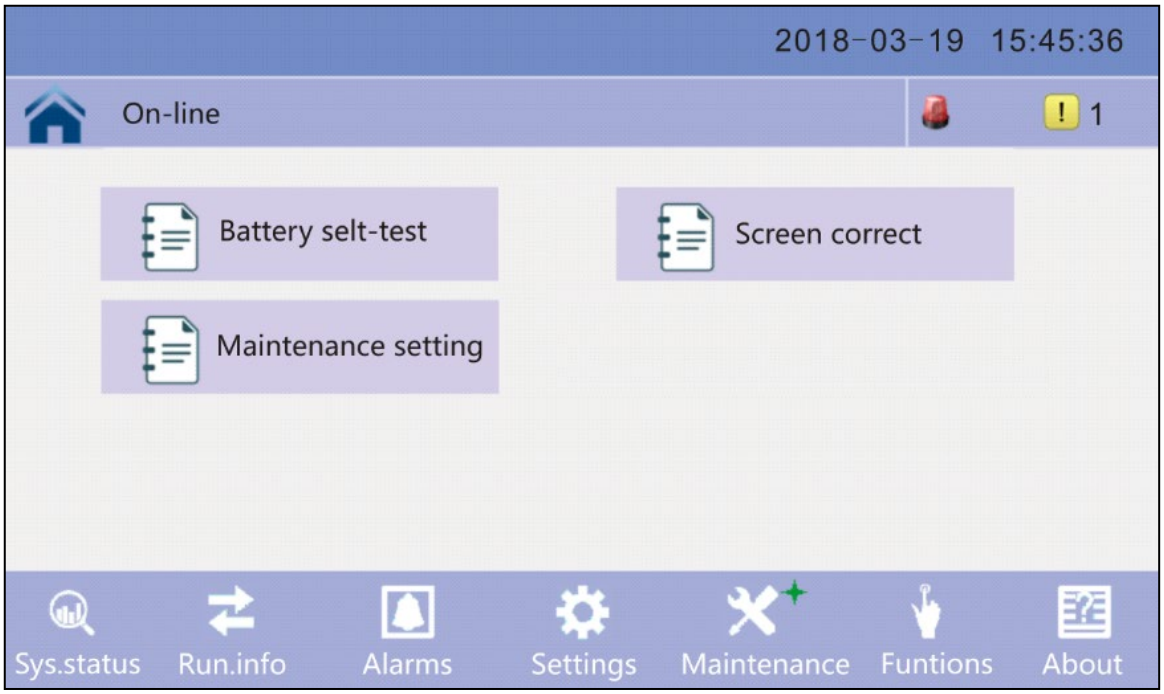




4.3.6 Click on Maintenance icon to enter setting screen, click on the back icon return to last screen and click on the homepage icon jump to main page



4.3.7 Click on Function icon to enter setting screen, click on the back icon to return to last screen 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
2	Inverter fault (Including Inverter bridge is shorted)	Beep continuously	Fault LED
3	Inverter Thyristor Short	Beep continuously	Fault LED
4	Inverter Thyristor Short	Beep continuously	Fault LED
5	Bypass Thyristor Short	Beep continuously	Fault LED
6	Bypass Thyristor Fault	Beep continuously	Fault LED
7	Fuse Fault	Beep continuously	Fault LED
8	Parallel Relay Fault	Beep continuously	Fault LED
9	Fan Fault	Beep continuously	Fault LED
10	Reserve	Beep continuously	Fault LED
11	Auxiliary power 1 fault	Beep continuously	Fault LED
12	Initialization Fault	Beep continuously	Fault LED
13	P-Battery Charger Fault	Beep continuously	Fault LED
14	N-battery Charger Fault	Beep continuously	Fault LED
15	DC Bus Over Voltage	Beep continuously	Fault LED
16	DC Bus Below Voltage	Beep continuously	Fault LED
17	DC Bus Unbalance	Beep continuously	Fault LED
18	Soft Start Failed	Beep continuously	Fault LED

19	Rectifier Over Temperature	Twice per second	Fault LED
20	Inverter Over Temperature	Twice per second	Fault LED
21	Input Neutral Line Missing	Twice per second	Fault LED
22	Battery counter	Twice per second	Fault LED
23	Parallel Cable Connection Error	Twice per second	Fault LED
24	CAN Comm. Fault	Twice per second	Fault LED
25	Parallel Load Sharing Fault	Twice per second	Fault LED
26	Battery Over Voltage	Once per second	Fault LED flashing
27	Mains Site Wiring Fault	Once per second	Fault LED flashing
28	Bypass Site Wiring Fault	Once per second	Fault LED flashing
29	Output Shortcut	Once per second	Fault LED flashing
30	Rectifier over current Fault	Once per second	Fault LED flashing
31	Bypass Over Current	Once per second	BPS LED flashing
32	Overload	Once per second	INV or BPS LED flashing
33	No battery	Once per second	Battery LED flashing
34	Battery Under Voltage (Low Battery protection)	Once per second	Battery LED flashing
35	Battery volt warning (Battery Voltage Low)	Once per second	Battery LED blinking
36	Inner Communication Fault	Once per 2 seconds	Fault LED flashing
37	DC Component Over Limit. (Unbalance INV. DC)	Once per 2 seconds	INV LED flashing
38	Parallel Overload	Once per 2 seconds	INV LED flashing
39	Mains Volt. Abnormal	Once per 2 seconds	Battery LED
40	Mains Freq. Abnormal	Once per 2 seconds	Battery LED
41	Bypass Not Available		BPS LED flashing
42	Bypass Unable to Trace		BPS LED flashing
43	Inverter On Invalid		

4.4 Options

SNMP card: internal SNMP / external SNMP optional

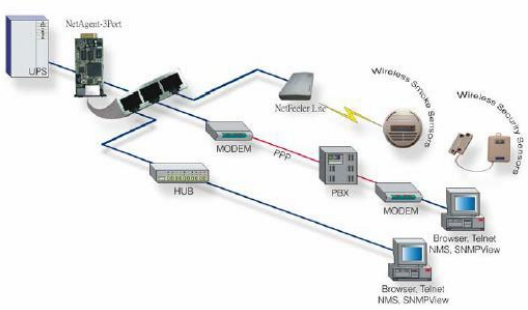
- Loosen the 2 torque screws (on each side of the card).
- Carefully pull out the card. Reverse the procedure for re-installation

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

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

In addition to the features of a standard NetAgent Mini, NetAgent II has the option to add NetFeeler Lite to detect temperature, humidity, smoke and security sensors. Thus, making

NetAgent II a versatile management tool. NetAgent II also supports multiple languages and is setup for web-based auto language detection.



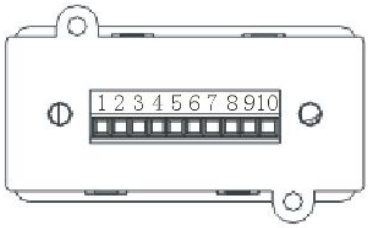
Typical topology of the UPS Network Management

Relay card

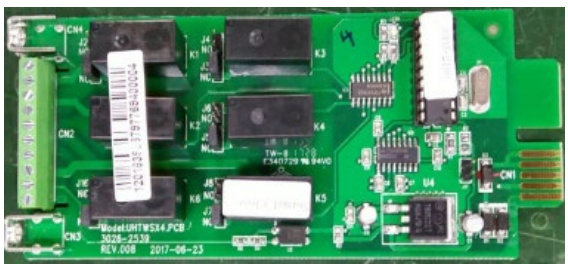
A 10-pin terminal is supported to offer the signals of Bypass, AC Failure, Inverter On, Battery Low, UPS fault, UPS Common Alarm, and UPS Shutdown.

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			10KVA(S/H)		20KVA(S/H)	30KVA(S/H)	40KVA(S/H)
Capacity (VA/Watts)			10kVA/9kW		20kVA/18kW	30kVA/27kW	40kVA/36kW
INPUT							
Input	**Rectifier input**	Rated AC Input Voltage	380/400/415Vac, (3Ph+N+PE)				
		Input Voltage Range	305~478Vac (Full load); 208~478Vac (50% Load)				
		Frequency	40-70Hz				
		Power Factor	0.99				
		Harmonic distortion (THDi)	≤3% (100% nonlinear load)				
	Bypass input	Rated AC Voltage	380/400/415Vac, (3Ph+N+PE)				
		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%)				
		Bypass frequency Range	±10%				
		Synchronization - Window	±1%/±2%/±4%/±5%/±10% optional (default: ±10%)				
		Max current (A)	Breaker 20A		Breaker 40A	Breaker 63A	Breaker 80A
		Upstream protection, bypass line	Thermomagnetic circuit-breaker, rated up to 125% of nominal output current. IEC 60947-2 curve C.				
		Current rating of neutral cable (A)	1.7×In				
	Generator Input		Support				
OUTPUT							
Inverter Output	Power factor		0.9				
	Rated AC Voltage 1		380/400/415Vac, (3Ph+N+PE)				
	Voltage Regulation		±1%				
	Transient Voltage Response		±5% (linear load)				
	Phase Balance		120° ±1° (100% unbalanced load)				
	Frequency		1.Line Mode: synchronize with input; when input frequency ＞±10% (±1%/±2%/±4%/±5% optional), output ±0.05 Hz 2.Battery Mode ±0.05 Hz				
	Crest factor		3:1				
	Harmonic distortion (THD)		< 2% (linear load), <5% (nonlinear load)				
	Overload Capacity	AC Mode	Load≤110%: last 60min change to bypass, ≤125%: last 10min, change to bypass, ≤150%: last 1min change to bypass, >150% change to bypass immediately				
		Bat. Mode	Load≤110%: last 10min， ≤125%: last 1min，≤150%: last 5S，＞150% shut down UPS immediately				
Efficiency	Normal mode		Up to 93.5%	Up to 94.5%			

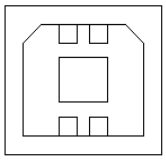
BATTERY							
Battery	Battery voltage	Standard unit	±120Vdc (2x20pcs 12V9AH); (3x20pcs 12V9AH optional)	±120Vdc (2x20pcs 12V9AH); (3x20pcs 12V9AH optional)	±180Vdc (2x30pcs 12V9AH)	±180Vdc (2x30pcs 12V9AH)	
		Long run unit	10-30kVA: ±96/108/120Vdc; battery quantity (16~20 pcs, 16 pcs define, Standard unit and 20 pcs no power derating; 18 pcs output power factor 0.8/0.9; 16 pcs output power factor 0.7/0.8;)				
			40kVA / 10-30kVA (Optional): ±180/192/204/216/228/240/252/264/276/288/300Vdc (30/32/34/36/38/40/42/44/46/48/50pcs optional)				
	Float Voltage		2.25V/cell (selectable from 2.20-2.29V/cell) Constant current and constant voltage charge mode				
	Boost Charge Voltage		2.30V/cell (selectable from 2.30-2.40V/cell) Constant current and constant voltage charge mode				
	End of Discharge		1.75 V/cell (selectable from 1.60 or 1.90V/cell)				
	Charge Current(A) (charge current can be set according to battery capacity installed)		Standard unit: 2.7A(4.05A optional); Long run unit: Max. current 18A (limited by input current)		Standard unit: 2.7A(4.05A optional); Long run unit: Max. current 18A (limited by input current)	Standard unit: 4.05A; Long run unit: Max. current 20A (limited by input current)	Standard unit: 2.7A; Long run unit: Max. current 20A (limited by input current)
SYSTEM FEATURES							
Transfer Time	Synchronous transfer		Utility to Battery : 0ms; Utility to bypass: 0ms				
	Asynchronous transfer		Asynchronous transfer: 15ms (50 Hz)				
Alarms			overload, utility abnormal, UPS fault, battery low, etc.				
Protection			short circuit, overload, over temperature, battery low, fan fault alarm.				
Communication Interface			USB, RS232,RS485, Parallel port, Dry contact, Intelligent slot, SNMP card (optional), Relay card (optional),Battery temperature sensor(optional)				
ENVIRONMENTAL							
Environment	Operating Temperature		0℃～40℃				
	Storage Temperature		-25℃～55℃(no battery)				
	Humidity		0～95% non condensing				
	Acoustical Noise (from 1M distance)		<55dB		<58dB	<61dB	<64dB
	Altitude		< 1500m.When>1500m,lower the rated power for use				
PHYSICAL							
Dimension W×D×H (mm)			Standard unit：250×900×868 Long run unit：250×580×655				
Net weight (Kg)			129/35	186/39	187/40	236/43	239/46
STANDARDS							
Safety certifications			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

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	AC normal but AC LED does not illuminate, and the UPS operates on battery mode only	The input breakers of the UPS are not switched on; input cable fault	Switch on the input breaker. Check input cabling
3	The UPS does not indicate any failure, but no output voltage	Output cable fault Output breaker do not switch on	Make sure the output cable is connected Switch on the output breaker.
4	AC LED is flashing	AC voltage exceeds UPS input range.	If the UPS operates on 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 is not switched on, or batteries are damaged, or there is a battery connection fault. 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. Set the LCD setting of the battery number and capacity correctly
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	Set the UPS working mode to Normal mode
9	Cannot cold start	Battery switch is not properly closed: Battery fuse is faulty: Or Battery low: Battery quantity set wrong; Power breaker in the rear panel is not switch ON.	Close the battery switch: Change the fuse: Recharge the battery: Power ON the UPS with AC to set the battery 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

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

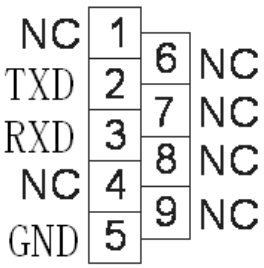
Parity check ---------none

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

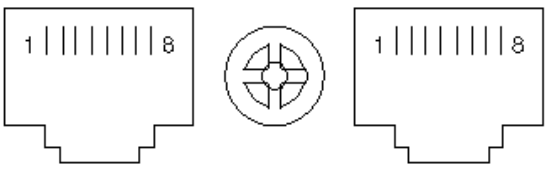
Parity check ---------none

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.

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

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!

6. Functions and features

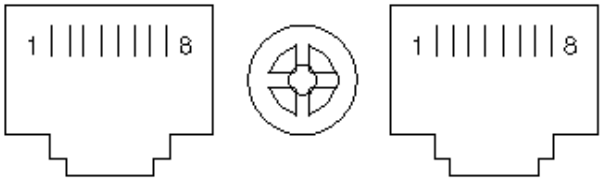
- 3Phase In/3Phase Out UPS
- Digital Control -The UPS is controlled by Digital Signal Processor (DSP); enhance, it increases reliability, performance, self-protection, and self-diagnostics etc.
- Adjustable battery Configuration
- Charging Current - configurable via the setting tool, you can set the capacity of the batteries, reasonable charging current and maximum charging current. Constant voltage mode, constant current mode or floating mode can be switched automatically.
- Intelligent Charging Method -the UPS adopts advanced three-stage charging method, to extend the life of the batteries and guarantees fast charging.

1st stage: High current constant current charging - guaranteed to charge back to 90%.
2nd-stage: Constant Voltage - To vitalise battery and make sure batteries are fully charged
3rd stage: floating mode

- LCD/LED Display - shows UPS status and its operational parameters
- Intelligent Monitoring Function - via optional SNMP Card, you can remotely control and monitor the UPS.
- EPO Function - UPS can be shut off when the EPO is pressed. REPO function (Remote EPO) is also available.

Appendix 6 BAT_T communication port definition

Definition of port:



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

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 BAT_T

◆Battery environment temperature monitoring.

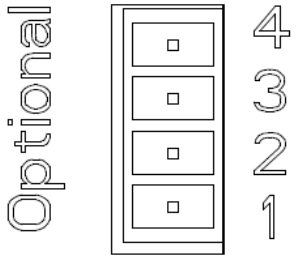
◆Charging voltage modulation depending on batteries’ temperature.

Appendix 7 Optional port definition

Definition of Male port:

Instruction:

Relay Dry Contact Port 5A/277Vac



UPS	Instruction
Pin1	Normally NC
Pin2	Normally NO
Pin3	/
Pin4	Common

Function 1 description (default, internal J6 jumper):

◆ Drive the bypass breaker when back feed alarm.

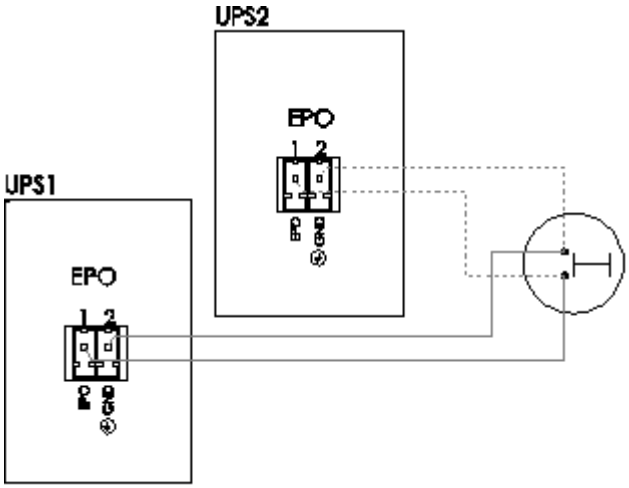
Function 2 description (Optional, internal J5 jumper):

◆ Drive the battery breaker when battery voltage low.

Appendix 8 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 stops all units at once.