Publish statement
Thank you for purchasing this series UPS.
This series UPS is an intelligent, Three phase in Three phase out, high frequency online UPS designed by our R&D team who is with years of designing experiences on UPS. With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world’s advanced level.
Read this manual carefully before installation
This manual provides technical support to the operator of the equipment.
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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, 120/127VAC voltage may still exist at UPS outlet!
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℃, 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!
2. Main Features

2.1 Summarization

This series UPS is a kind of three-in-three-out high frequency online UPS, it provides seven
capacities: The 50KVA/60KVA/80KVA. 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, self-diagnostics and so on.

◆ Charging Current is configurable

The user may set the capacity of the batteries as well as reasonable 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%;
2Pnd-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 The appearance of the product

![Front View](image1.png)  ![Side View](image2.png)  ![Rear View](image3.png)
(1) LCD panel

(2) Front lock

(3) Parallel port 1/2 cover: Open cover to connect parallel wires

(4) Optional Switch: can optional bypass switch and battery switch
(5) Terminal block cover back of UPS: Open cover to connect bypass wires and battery wires on condition that UPS have bypass switch and battery switch.

(6) Power units

(7) Communication panel: Intelligent Solt *2, RS232 port, USB port, RS485 port, Cold start and EPO button, REPO port.

(8) Maintenance switch cover: take out the cover then UPS turn to maintenance mode

(9) Input switch

(10) Maintenance switch

(11) Output switch

(12) Terminal block cover in front UPS: Open cover to connect input & output & battery wires.

**Communication panel**

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Intelligent Solt: can insert SNMP card or relay card.</td>
</tr>
<tr>
<td>(2)</td>
<td>Cold Start: Start UPS without input AC through battery.</td>
</tr>
<tr>
<td>(3)</td>
<td>EPO</td>
</tr>
<tr>
<td>(4)</td>
<td>REPO</td>
</tr>
<tr>
<td>(5)</td>
<td>Intelligent Solt: can insert SNMP card or relay card.</td>
</tr>
<tr>
<td>(6)</td>
<td>RS485</td>
</tr>
<tr>
<td>(7)</td>
<td>LBS</td>
</tr>
<tr>
<td>(8)</td>
<td>RS232: USB, RS232, RS485 cannot be used at the same time</td>
</tr>
<tr>
<td>(9)</td>
<td>USB: USB, RS232, RS485 cannot be used at the same time</td>
</tr>
<tr>
<td>(10)</td>
<td>RS232: PIN1:TX, PIN2:RX, PIN4:GND; USB, RS232, RS485 cannot be used at the same time</td>
</tr>
</tbody>
</table>
3.3 LCD control panel

(1) LED (from top to bottom: “mains output”, “bypass output”, “battery output”, “alarm”)

(2) LCD display

(3) Function button

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 6 months. Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

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

<table>
<thead>
<tr>
<th>Altitude (m)</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
<th>3500</th>
<th>4000</th>
<th>4500</th>
<th>5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load coefficient</td>
<td>100%</td>
<td>95%</td>
<td>90%</td>
<td>85%</td>
<td>80%</td>
<td>75%</td>
<td>70%</td>
<td>65%</td>
</tr>
</tbody>
</table>

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

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 ANY 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 below:

<table>
<thead>
<tr>
<th>UPS cabinet</th>
<th>Cable Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AC Input (mm²)</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>80</td>
<td>95</td>
</tr>
</tbody>
</table>

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.
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, battery negative. The terminal block’s left & right ends each has a connector for Ground.

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;

Wiring

**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, total 24 in series. A neutral cable is retrieved from the joint between the cathode of the 12th and the anode of the 13th 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.
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.

**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 Multi—Module Installation

The basic installation procedure of a parallel system comprising of two or more UPS modules is
the same as that of single module system. 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.

![Parallel Cabinet Diagram]

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, A (L1), B (L2), C (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 modules as shown below. The parallel control board is mounted on each UPS module. The ring configuration ensures high reliability of the control.

3.10 LBS installation

**LBS system contains LCD set, cable connect and STS device.**

3.10.1 LCD setting

Set every UPS of the systems to be LBS Master or LBS Slave. For instance if the UPS belongs to LBS master system, its LBS setting must be set to Master.

3.10.2 LBS cable installation

The two ports of one mesh wire should be plug into RJ45 interface of any one UPS of both master and slave system.

3.10.3 UPS installation

The whole systems is showed below.
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, then the LCD shows all related information on the screen.

◆ Parallel redundancy mode (system expansion)

To achieve a higher capacity and / or increase reliability, the outputs of up to four UPS modules can be programmed to operate in parallel and the built-in parallel controller in each UPS ensures automatic load sharing.

◆ LBS (Load Bus Synchronization)

The function of LBS is to keep the output of two independent UPS systems (single unit or multiple unit) in synchronization even when the two systems are operating on different modes (bypass/inverter) or on batteries. It is usually used with an STS (Static Transfer Switch) connected to the critical load to achieve Dual Bus configuration.

◆ 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.

◆ Open the front and rear doors of the UPS to access to the main power switches. During this procedure the output terminals will become alive.

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

CAUTION!

Be sure that the maintenance cover is closed well before turn on the UPS!
◆ **UPS Input Switch** (below the UPS module 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.

◆ **UPS Output Switch** (below the UPS module at the front door)

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 5; otherwise, jump to Step 4.

- Open the cover of maintenance switch, the UPS turns to bypass mode automatically.
- Turn on MAINTENANCE breaker;
- Open 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

**CAUTION!**
Be sure that the maintenance cover is closed well before turn on the UPS!

- Open the front door of the UPS to be easily access to the main power switch.
- Switch ON the output breaker of the module.
- 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 bypass of the modules.
- 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 switch.
  The battery will feed the Auxiliary power board.
- Turn on the Output switch
- Trigger the cold start button of the module as the position 5 of the above
When battery normal, rectifier starts operation, 30s later, inverter starts and operates and battery LED on

**CAUTION!**
Wait for approximately 30 seconds when close the battery switch before you press the cold start key.

### 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.

- Open the BATTERY breaker;
- Open the UPS door to easily access to the main power switch;
- Switch OFF the input breaker.
- Open the OUTPUT power switch. 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.

### 4.3 The Display

#### 4.3.1 LCD display

**Introduction**

**CAUTION!**
The display provides more functions than those described in this manual.
### LCD SELFTESTING

**NOR 10:24:00 12-20**

- **LOAD:** 0%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 0V 0V 0V
- **O/P FREQ:** 60.0Hz
- **STATUS:** UPS NOT ON

**TURN ON UPS**

**NOR 10:24:00 12-20**

- **LOAD:** 84%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 120V 120V 120V
- **I/P FREQ:** 60.0Hz
- **O/P FREQ:** 60.0Hz
- **STATUS:** BYPASS MODE

### UPS SELFTEST

**NOR 10:24:00 12-20**

- **LOAD:** 0%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 0V 0V 0V
- **O/P FREQ:** 60.0Hz
- **STATUS:** UPS NOT ON

**CONFIRM TURN TO BYPASS**

**NOR 10:24:00 12-20**

- **LOAD:** 0%
- **PBATT:** 120V
- **I/P VOLT:** 0V 0V 0V
- **O/P VOLT:** 0V 0V 0V
- **I/P FREQ:** 0.0Hz
- **O/P FREQ:** 0.0Hz
- **STATUS:** UPS NOT ON

### TURN TO BYPASS

**NOR 10:24:00 12-20**

- **LOAD:** 84%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 120V 120V 120V
- **I/P FREQ:** 60.0Hz
- **O/P FREQ:** 60.0Hz
- **STATUS:** MAINS OK

### TURN TO BYPASS

**NOR 10:24:00 12-20**

- **LOAD:** 84%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 120V 120V 120V
- **I/P FREQ:** 60.0Hz
- **O/P FREQ:** 60.0Hz
- **STATUS:** MAINS OK

### INVERTER TURN ON

**NOR 10:24:00 12-20**

- **LOAD:** 0%
- **PBATT:** 120V
- **I/P VOLT:** 0V 0V 0V
- **O/P VOLT:** 0V 0V 0V
- **O/P FREQ:** 0.0Hz
- **STATUS:** UPS NOT ON

### INVERTER TURN OFF

**NOR 10:24:00 12-20**

- **LOAD:** 84%
- **PBATT:** 120V
- **I/P VOLT:** 120V 120V 120V
- **O/P VOLT:** 120V 120V 120V
- **I/P FREQ:** 60.0Hz
- **O/P FREQ:** 60.0Hz
- **STATUS:** MAINS OK

### TURNING OFF

**NOR 10:24:00 12-20**

- **LOAD:** 0%
- **PBATT:** 120V
- **I/P VOLT:** 0V 0V 0V
- **O/P VOLT:** 0V 0V 0V
- **I/P FREQ:** 0.0Hz
- **O/P FREQ:** 0.0Hz
- **STATUS:** UPS NOT ON

**CANCEL**
<table>
<thead>
<tr>
<th>TIME</th>
<th>DESCRIPTION</th>
<th>DATA</th>
</tr>
</thead>
</table>
| 10:24:00 12-20 | SELFTEST INFORMATION PROMPT | LOAD: 84% PBATT:120V  
I/P VOLT:120V 120V 120V  
O/P VOLT:120V 120V 120V  
I/P FREQ:60.0Hz  
O/P FREQ:60.0Hz  
STATUS:MAINS OK |
| 10:24:00 12-20 | INQUIER-DETAIL | ITEM: AN BN CN  
I/P VOLT:120V 120V 120V  
I/P CURR: 0 0 0A  
I/P FREQ:60.0Hz  
STATUS:MAINS OK |
| 10:24:00 12-20 | INQUIER-INPUT | kW kVA  
A: 0.00 0.00  
A: 0.00 0.00  
A: 0.00 0.00  
STATUS:MAINS OK |
| 10:24:00 12-20 | INQUIER-OUTPUT | PBATT VOLT:144V 10A  
NBATT VOLT:144V 10A  
STATUS:CHARGING  
CAP:100%  
REMAINING TIME:100MIN  
STATUS:MAINS OK |
| 10:24:00 12-20 | INQUIER-BATTERY | LOAD |
| 10:24:00 12-20 | INQUIER-LOAD | LOAD: 0% PBATT:120V  
I/P VOLT:120V 120V 120V  
O/P VOLT: 0V 0V 0V  
I/P FREQ:60.0Hz  
O/P FREQ:0.0Hz  
STATUS:UPS FAILURE |
| 10:24:00 12-20 | SELFTEST | LOAD: 84% PBATT:120V  
I/P VOLT:120V 120V 120V  
O/P VOLT:120V 120V 120V  
I/P FREQ:60.0Hz  
O/P FREQ:60.0Hz  
STATUS:UPS SELFTEST |
| 10:24:00 12-20 | INQUIER | LOAD |
| 10:24:00 12-20 | OUTPUT | INPUT |
| 10:24:00 12-20 | SERVICE |
| 10:24:00 12-20 | MAINTAIN |
| 10:24:00 12-20 | INQUIER MENU | LOAD |
| 10:24:00 12-20 | INQUIER-LOAD | INQUIER ——ALARM ON |
## Alarm Information

<table>
<thead>
<tr>
<th>Event log</th>
<th>UPS Alarm Warning</th>
<th>Buzzer</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rectifier Fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>2</td>
<td>Inverter fault(Including Inverter bridge is shorted)</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>3</td>
<td>Inverter Thyristor short</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>4</td>
<td>Inverter Thyristor broken</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>5</td>
<td>Bypass Thyristor short</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>6</td>
<td>Bypass Thyristor broken</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>7</td>
<td>Fuse broken</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>8</td>
<td>Parallel relay fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>9</td>
<td>Fan fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>10</td>
<td>Reserve</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>11</td>
<td>Auxiliary power fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>12</td>
<td>Initialzition fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>13</td>
<td>P-Battery Charger fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>14</td>
<td>N-Battery Charger fault</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>15</td>
<td>DC Bus over voltage</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>16</td>
<td>DC Bus below voltage</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>17</td>
<td>DC bus unbalance</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>18</td>
<td>EPO shutdown</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>19</td>
<td>Soft start failed</td>
<td>Beep continuously</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>20</td>
<td>Rectifier Over Temperature</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>21</td>
<td>Inverter Over temperature</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>22</td>
<td>Reserve</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Frequency</td>
<td>LED Indication</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>23</td>
<td>Battery reverse</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>24</td>
<td>Cable connection error</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>25</td>
<td>CAN comm. Fault</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>26</td>
<td>Parallel load sharing fault</td>
<td>Twice per second</td>
<td>Fault LED lit</td>
</tr>
<tr>
<td>27</td>
<td>Battery over voltage</td>
<td>Once per second</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>28</td>
<td>Mains Site Wiring Fault</td>
<td>Once per second</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>29</td>
<td>Bypass Site Wiring Fault</td>
<td>Once per second</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>30</td>
<td>Output Short-circuit</td>
<td>Once per second</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>31</td>
<td>Rectifier over current</td>
<td>Once per second</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>32</td>
<td>Bypass over current</td>
<td>Once per second</td>
<td>INV or BPS LED blinking</td>
</tr>
<tr>
<td>33</td>
<td>Overload</td>
<td>Once per second</td>
<td>INV or BPS LED blinking</td>
</tr>
<tr>
<td>34</td>
<td>No battery</td>
<td>Once per second</td>
<td>Battery LED blinking</td>
</tr>
<tr>
<td>35</td>
<td>Battery under voltage</td>
<td>Once per second</td>
<td>Battery LED blinking</td>
</tr>
<tr>
<td>36</td>
<td>Battery low pre-warning</td>
<td>Once per second</td>
<td>Battery LED blinking</td>
</tr>
<tr>
<td>37</td>
<td>Internal Communication Error</td>
<td>Once per 2 seconds</td>
<td>Fault LED blinking</td>
</tr>
<tr>
<td>38</td>
<td>DC component over limit.</td>
<td>Once per 2 seconds</td>
<td>INV LED blinking</td>
</tr>
<tr>
<td>39</td>
<td>Parallel Overload</td>
<td>Once per 2 seconds</td>
<td>INV LED blinking</td>
</tr>
<tr>
<td>40</td>
<td>Mains volt. Abnormal</td>
<td>Once per 2 seconds</td>
<td>Battery LED lit</td>
</tr>
<tr>
<td>41</td>
<td>Mains freq. abnormal</td>
<td>Once per 2 seconds</td>
<td>Battery LED lit</td>
</tr>
<tr>
<td>42</td>
<td>Bypass Not Available</td>
<td></td>
<td>BPS LED blinking</td>
</tr>
<tr>
<td>43</td>
<td>Bypass unable to trace</td>
<td></td>
<td>BPS LED blinking</td>
</tr>
<tr>
<td>44</td>
<td>Inverter on invalid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Module screw unlock</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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.
Relay card

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

The relay card includes 6 output ports and one input port. Please refer to the following table for detail.

DB9 interface: Connect to upper control terminal. The definition of the pins is defined as below:

<table>
<thead>
<tr>
<th>Pin-out</th>
<th>Function description</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UPS Failure</td>
<td>Output</td>
</tr>
<tr>
<td>2</td>
<td>Summary Alarm</td>
<td>Output</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Remote Shutdown</td>
<td>Input</td>
</tr>
<tr>
<td>5</td>
<td>Common</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bypass</td>
<td>Output</td>
</tr>
<tr>
<td>7</td>
<td>Battery Low</td>
<td>Output</td>
</tr>
<tr>
<td>8</td>
<td>UPS ON</td>
<td>Output</td>
</tr>
<tr>
<td>9</td>
<td>Utility Failure</td>
<td>Output</td>
</tr>
</tbody>
</table>
# Appendix 1 Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>HI3305</th>
<th>HI3306</th>
<th>HI3308</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>50KVA 45KW</td>
<td>60KVA 54KW</td>
<td>80KVA 72KW</td>
</tr>
<tr>
<td>Phase</td>
<td>3 Phase 4 Wires and Ground</td>
<td>3 Phase 4 Wires and Ground</td>
<td>3 Phase 4 Wires and Ground</td>
</tr>
<tr>
<td>Rated Voltage</td>
<td>120/208,127/220Vac</td>
<td>120/208,127/220Vac</td>
<td>120/208,127/220Vac</td>
</tr>
<tr>
<td>Voltage Range</td>
<td>72/125~160/275Vac</td>
<td>72/125~160/275Vac</td>
<td>72/125~160/275Vac</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>40Hz-70Hz</td>
<td>40Hz-70Hz</td>
<td>40Hz-70Hz</td>
</tr>
<tr>
<td>Power Factor</td>
<td>≥0.99</td>
<td>≥0.99</td>
<td>≥0.99</td>
</tr>
<tr>
<td>Current THDi</td>
<td>≤3% (100% nonlinear load)</td>
<td>≤3% (100% nonlinear load)</td>
<td>≤3% (100% nonlinear load)</td>
</tr>
<tr>
<td>Bypass Voltage Range</td>
<td>Max. voltage: +15%(optional +10%/+20%/+25%) Min. voltage: -20% (optional -10%/-30%/-40%)</td>
<td>Max. voltage: +15%(optional +10%/+20%/+25%) Min. voltage: -20% (optional -10%/-30%/-40%)</td>
<td>Max. voltage: +15%(optional +10%/+20%/+25%) Min. voltage: -20% (optional -10%/-30%/-40%)</td>
</tr>
<tr>
<td>Generator Input Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Phase</td>
<td>3 Phase 4 Wires and Ground</td>
<td>3 Phase 4 Wires and Ground</td>
<td>3 Phase 4 Wires and Ground</td>
</tr>
<tr>
<td>Rated Voltage</td>
<td>120/208,127/220Vac</td>
<td>120/208,127/220Vac</td>
<td>120/208,127/220Vac</td>
</tr>
<tr>
<td>Power Factor</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Voltage Regulation</td>
<td>±1%</td>
<td>±1%</td>
<td>±1%</td>
</tr>
<tr>
<td>Frequency Utility Mode</td>
<td>±1%/±2%/±4%/±5%/±10%of the rated frequency(optional)</td>
<td>±1%/±2%/±4%/±5%/±10%of the rated frequency(optional)</td>
<td>±1%/±2%/±4%/±5%/±10%of the rated frequency(optional)</td>
</tr>
<tr>
<td>Battery Mode</td>
<td>(50/60±0.1)Hz</td>
<td>(50/60±0.1)Hz</td>
<td>(50/60±0.1)Hz</td>
</tr>
<tr>
<td>Crest Factor</td>
<td>3:1</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>THD</td>
<td>≤2% with linear load</td>
<td>≤2% with linear load</td>
<td>≤2% with linear load</td>
</tr>
<tr>
<td></td>
<td>≤5% with non linear load</td>
<td>≤5% with non linear load</td>
<td>≤5% with non linear load</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>±144V DC (24PCS)</td>
<td>±144V DC (24PCS)</td>
<td>±144V DC (24PCS)</td>
</tr>
<tr>
<td>Charge Current(A)</td>
<td>24A max</td>
<td>30A max</td>
<td>36A max</td>
</tr>
<tr>
<td>Transfer Time</td>
<td>Utility to Battery: 0ms; Utility to bypass: 0ms</td>
<td>Utility to Battery: 0ms; Utility to bypass: 0ms</td>
<td>Utility to Battery: 0ms; Utility to bypass: 0ms</td>
</tr>
<tr>
<td>Overload AC Mode</td>
<td>Load≤110%: last 60min, ≤125%: last 10min, ≤150%: last 1min, ≥150% shut down UPS immediately.</td>
<td>Load≤110%: last 60min, ≤125%: last 10min, ≤150%: last 1min, ≥150% shut down UPS immediately.</td>
<td>Load≤110%: last 60min, ≤125%: last 10min, ≤150%: last 1min, ≥150% shut down UPS immediately.</td>
</tr>
<tr>
<td>Bat. Mode</td>
<td>Load≤110%: last 10min, ≤125%: last 1min, ≤150%: last 5s, ≥150% shut down UPS immediately.</td>
<td>Load≤110%: last 10min, ≤125%: last 1min, ≤150%: last 5s, ≥150% shut down UPS immediately.</td>
<td>Load≤110%: last 10min, ≤125%: last 1min, ≤150%: last 5s, ≥150% shut down UPS immediately.</td>
</tr>
<tr>
<td>Bypass Mode</td>
<td>225A</td>
<td>250A</td>
<td>250A</td>
</tr>
<tr>
<td>Short Circuit</td>
<td>Hold Whole System</td>
<td>Hold Whole System</td>
<td>Hold Whole System</td>
</tr>
<tr>
<td>Overheat</td>
<td>Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately</td>
<td>Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately</td>
<td>Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately</td>
</tr>
<tr>
<td>Battery Low</td>
<td>Alarm and Switch off</td>
<td>Alarm and Switch off</td>
<td>Alarm and Switch off</td>
</tr>
<tr>
<td>Self-diagnostics</td>
<td>Upon Power On and Software Control</td>
<td>Upon Power On and Software Control</td>
<td>Upon Power On and Software Control</td>
</tr>
<tr>
<td>EPO(optional)</td>
<td>Shut down UPS immediately</td>
<td>Shut down UPS immediately</td>
<td>Shut down UPS immediately</td>
</tr>
<tr>
<td>Capacity</td>
<td>50KVA 45KW</td>
<td>60KVA 54KW</td>
<td>80KVA 72KW</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Battery Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise Suppression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complies with EN62040-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comunication Interface</strong></td>
<td>USB, RS485, Parallel, SNMP card (optional), Relay card (optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0℃ ~ 40℃</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-25℃ ~ 55℃</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 ~ 95% non condensing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1500m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audible &amp; Visual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Failure, Battery Low, Overload, System Fault</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status LED &amp; LCD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Mode, Bypass Mode, Battery Low, Battery Bad, Overload &amp; UPS Fault</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading On the LCD</td>
<td>Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage, parameter set, history record…</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Dimensions (W<em>D</em>H)</td>
<td>600<em>780</em>1600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>288</td>
<td>317</td>
<td>371</td>
<td></td>
</tr>
<tr>
<td><strong>Safety Conformance</strong></td>
<td>CE, EN/IEC 62040-2, EN/IEC 62040-1-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2 Problems and Solution

In case the UPS can not 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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Problem</th>
<th>Possible reason</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Utility is connected but the UPS can not be powered ON.</td>
<td>Input power supply is not connected; Input voltage low; The input switch of the module is not switched on.</td>
<td>measure if the UPS input voltage/frequency are within the window. Check if all modules input are switched on.</td>
</tr>
<tr>
<td>2</td>
<td>Utility normal but Utility LED does not light on, and the UPS operates at battery mode</td>
<td>The input breakers of the Modules are not switched on; input cable is not well connected</td>
<td>Switch on the input breaker; Make sure the input cable is well connected.</td>
</tr>
<tr>
<td>3</td>
<td>The UPS does not indicate any failure, but output do not have voltage</td>
<td>Output cable does not well connected</td>
<td>Make sure the output cable is well connected.</td>
</tr>
<tr>
<td>4</td>
<td>The UPS module can not transfer to bypass or inverter</td>
<td>Module does not well inserted; The left coronal screw is not tight. Output breaker do not switch on</td>
<td>Pull out the module and insert again; Tighten the screw; Switch on the output breaker.</td>
</tr>
<tr>
<td>5</td>
<td>Utility LED is flashing</td>
<td>Utility voltage exceeds UPS input range.</td>
<td>If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.</td>
</tr>
<tr>
<td>6</td>
<td>Battery LED is flashing but no charge voltage and current</td>
<td>Battery breaker does not switch on, or batteries are damaged, or battery is reversely connected. battery number and capacity are not set correctly.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Problem Description</td>
<td>Potential Cause(s)</td>
<td>Solution(s)</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>Buzzer beeps every 0.5 seconds and LCD display “output overload”</td>
<td>Overload</td>
<td>remove some load</td>
</tr>
<tr>
<td>8</td>
<td>Buzzer long beeps, LCD display “output short circuit”</td>
<td>The UPS output is in short circuit</td>
<td>Make sure the load is not in short circuit, then restart the UPS.</td>
</tr>
<tr>
<td>9</td>
<td>The LED of the Module with RED light</td>
<td>The module is not inserted properly.</td>
<td>Pull out the module and insert properly.</td>
</tr>
<tr>
<td>10</td>
<td>The UPS only works on bypass mode</td>
<td>The UPS is set to ECO mode</td>
<td>Set the UPS working mode to Single Module type(non-parallel)</td>
</tr>
<tr>
<td>11</td>
<td>Can not cold start</td>
<td>Battery switch is not properly closed:</td>
<td>Close the battery switch; Change the fuse; Recharge the battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Battery fuse broken down; Or Battery low</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Buzzer beeps continuously and LCD indicates Rectifier fault or output fault</td>
<td>UPS is out of order</td>
<td>Consult with your local agent for repair</td>
</tr>
</tbody>
</table>
Appendix 3 USB communication port definition

Definition of port:

Connection between PC USB port and UPS USB port.

<table>
<thead>
<tr>
<th>PC USB port</th>
<th>UPS RS232 port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1</td>
<td>Pin 1</td>
<td>PC : +5V</td>
</tr>
<tr>
<td>Pin 2</td>
<td>Pin 2</td>
<td>PC : DPLUS signal</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Pin 3</td>
<td>PC : DMINUS signal</td>
</tr>
<tr>
<td>Pin 4</td>
<td>Pin 4</td>
<td>Signal ground</td>
</tr>
</tbody>
</table>

Available function of USB

◆ 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& RS485 ports cannot be used at the same time.
Appendix 4 RS232 communication port definition

Definition of Male port:

- Pin 2: UPS send, PC receive
- Pin 3: PC send, UPS receive
- Pin 5: ground

<table>
<thead>
<tr>
<th>PC RS232 port</th>
<th>UPS RS232 port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 2</td>
<td>Pin 2</td>
</tr>
<tr>
<td></td>
<td>UPS send, PC receive</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Pin 3</td>
</tr>
<tr>
<td></td>
<td>PC send, UPS receive</td>
</tr>
<tr>
<td>Pin 5</td>
<td>Pin 5</td>
</tr>
<tr>
<td></td>
<td>ground</td>
</tr>
</tbody>
</table>

Available function of RS232

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

RS-232 communication data format

- Baud rate: 9600bps
- Byte length: 8bit
- End bit: 1bit
- Parity check: none

CAUTION!

USB &RS232& RS485 ports cannot be used at the same time.
Appendix 5 RS232 communication port definition

Definition of port:

Connection between the Device’s RS232 port and UPS 4P terminal.

<table>
<thead>
<tr>
<th>PC (RS232)</th>
<th>UPS (4P terminal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 2</td>
<td>Pin 1</td>
<td>RS232-TX</td>
</tr>
<tr>
<td>Pin 3</td>
<td>Pin 2</td>
<td>RS232-RX</td>
</tr>
<tr>
<td>Pin 5</td>
<td>Pin 4</td>
<td>GND</td>
</tr>
</tbody>
</table>

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 & RS485 ports cannot be used at the same time.
Appendix 6 RS485 communication port definition

Definition of Male port:

Connection between the computer’s RS485 port and UPS RS485 port.

<table>
<thead>
<tr>
<th>PC 〈DB9 Male〉</th>
<th>UPS 〈DB9 Female〉</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1/5</td>
<td>Pin 1/5</td>
<td>485 “+”</td>
</tr>
<tr>
<td>Pin 2/4</td>
<td>Pin 2/4</td>
<td>485 “-”</td>
</tr>
</tbody>
</table>

Available function of RS485

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

RS-485 communication data format

- Baud rate ---------- 9600bps
- Byte length ------- 8bit
- End bit --------- 1bit
- Parity check ------ none

CAUTION!

USB & RS232 & RS485 ports cannot be used at the same time.
Appendix 7 LBS communication port definition

Definition of port:

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

<table>
<thead>
<tr>
<th>UPS1 LBS1 (RJ45)</th>
<th>UPS2 LBS2 (RJ45)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1/5</td>
<td>Pin 1/5</td>
<td>LBS_BPSIDE_BC</td>
</tr>
<tr>
<td>Pin 2/4</td>
<td>Pin 2/4</td>
<td>LBS_TRACE_BC</td>
</tr>
<tr>
<td>Pin 8</td>
<td>Pin 8</td>
<td>GND</td>
</tr>
</tbody>
</table>

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 BAT_T communication port definition

Definition of port:

<table>
<thead>
<tr>
<th>Temperature sensor (RJ45)</th>
<th>UPS2 BAT_T (RJ45)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1/5</td>
<td>Pin 1/5</td>
<td>TX</td>
</tr>
<tr>
<td>Pin 2/4</td>
<td>Pin 2/4</td>
<td>RX</td>
</tr>
<tr>
<td>Pin 7</td>
<td>Pin 7</td>
<td>12V</td>
</tr>
<tr>
<td>Pin 8</td>
<td>Pin 8</td>
<td>GND</td>
</tr>
</tbody>
</table>

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

Available function of BAT_T

◆ Battery environment temperature monitoring.

◆ Charging voltage modulation depending on batteries’ temperature
Appendix 9 REPO instruction

Definition of port:

Connection diagram:

Connection between the button and UPS REPO port.

<table>
<thead>
<tr>
<th>Button</th>
<th>UPS REPO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1</td>
<td>Pin 1</td>
<td>GND</td>
</tr>
<tr>
<td>Pin 2</td>
<td>Pin 2</td>
<td>EPO</td>
</tr>
</tbody>
</table>

◆ In addition to the local EPO push button on the front panel of the UPS (that stops operation of that module when pressed for more than 3 second), the UPS also supports a remote emergency stop (REPO).

◆ A remote emergency stop switch (Dry contact signal and “normally open” - not provided) can be installed in a remote location and connection through simple wires to the REPO connector.

◆ The remote switch can be connected to several UPS’s in a parallel architecture allowing the user to stops all units at once.

◆ Additionally, a second system (not provided) can be connected to the remote switch to disconnect the main input and the secondary (bypass) input sources