

# **DSP MULTIPOWER UPS**

**5/6/10/15/20kVA**



## **USER MANUAL**

**UNINTERRUPTIBLE POWER SUPPLY UPS**

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# 1 Important Safety Instruction

## 1.1. An Important Notice

- 1.1.1 For parallel system installation, please refer to parallel installation guide.
- 1.1.2 Because of "LITTLE LEAKAGE CURRENTS" generated by EMI Filter of the UPS, it is necessary to double ensure if the earth of the UPS is properly grounded before AC mains is connected with.
- 1.1.3 To ensure safety in all applications where a UPS is hard wired to the Electrical Supply, ensure that the system is installed by a Qualified Electrical Contractor.
- 1.1.4 The UPS has its own internal energy source (battery). Should the battery be switched on when no AC power is available, there could be voltage at the output terminals.
- 1.1.5 Make sure that the AC Utility outlet is correctly grounded.
- 1.1.6 Do not open the case, as there are no serviceable parts inside. Your Warranty will be void.
- 1.1.7 Do not try to repair the unit yourself; contact your local supplier or your warranty will be void.
- 1.1.8 Please make sure that the input voltage of the UPS matches the supply voltage.
- 1.1.9 Use a certified input power cable with the correct plugs and sockets for the appropriate voltage system.
- 1.1.10 To eliminate any overheating of the UPS, keep all ventilation openings free from obstruction, and do not store "things" on top of the UPS. Keep the UPS 30 cm away from the wall.
- 1.1.11 Make sure the UPS is installed within the proper environment as specified. (0-40°C and 30-90% non-condensing humidity)
- 1.1.12 Do not install the UPS in direct sunlight. Your warranty may be void if the batteries fail.
- 1.1.13 Install the UPS indoors as it is not designed for installation outdoors.
- 1.1.14 Dusty, corrosive and salty environments can do damage to any UPS.
- 1.1.15 Install the UPS away from objects that give off excessive heat and areas that are excessively wet.
- 1.1.16 If liquids are split onto the UPS or foreign objects dropped into the unit, the warranty will be null and void.
- 1.1.17 The battery will discharge naturally if the system is unused for any length of time.
- 1.1.18 It should be recharged every 2-3 months if unused. If this is not done, then the warranty will be null and void. When installed and being used, the batteries will be automatically recharged and kept in top condition.
- 1.1.19 This UPS supports electronic equipment in offices, telecommunications, process control, medical and security applications. Non-authorized technician is not allowed to install the UPS in the following areas.

- a. Medical equipment directly related to human life

- b. Elevator, Metro (Subway) system or any other equipment related to human safety.
  - c. Public system or critical computer systems.
- 1.1.20 Do not install the UPS in an environment with sparks, smoke or gas.
- 1.1.21 Make sure the UPS is completely turned off when moving the UPS from one place to another. It might cause electrical shock if the output is not cut completely.
- 1.1.22 The UPS offers CVCF (Constant Voltage Constant Frequency) setting function. To set RT series to be a CVCF shall be required by a qualified technician.
- a. For correct setting and wiring, please contact with your local agent.
  - b. Do not do it by yourself; otherwise, your warranty will be void.
- 1.1.23 This UPS has been designed and constructed to protect your assets from the wide range of power aberrations experienced on Utility power lines today. It is your insurance for reliable, clean and stable voltage supply. It is worth taking care to install the system correctly and to have it maintained correctly by your local dealer.
- 1.1.24 **SAVE THESE INSTRUCTIONS** - This Manual Contains Important Instructions that should be followed during Installation and Maintenance of the UPS and Batteries.
- 1.1.25 Intended for Installation in a Controlled Environment.
- 1.1.26 Disconnection Device - **CAUTION** - A disconnect switch shall be provided by others for ac output circuit. To reduce the risk of fire, connect only to a circuit provided with branch circuit over-current protection for 30 amperes for 5/6KVA, 40 amperes for 10KVA, and 130 amperes for 15/20kVA rating in accordance with the National Electric Code, ANSI/NFPA 70.
- 1.1.27 **CAUTION** - To reduce the risk of fire, unit input connect only to a circuit provided with branch circuit over-current protection for 40 amperes for 5/6KVA, 65 amperes for 10KVA AND 130 amperes for 20kVA rating in accordance with the National Electric Code, ANSI/NFPA 70.
- 1.1.28 Use No. 10 AWG, 60°C copper wire and 22.1 lb-in Torque force when connecting to terminal block.
- 1.1.29 The units are to be installed so that is not likely to be contacted by people.
- 1.1.30 Maximum ambient operating temperature 40°C or equivalent.

## **1.2. Storage Instruction**

For extended storage through moderate climate, the batteries should be charged for 12 hours every 3 months by plugging the UPS power cord into the wall receptacle and turn on input breaker on front panel. Repeat this procedure every 2 months under high temperature environment.

## **2 Product Introduction**

### **2.1. General Characteristics**

- 2.1.1 True online architecture continuously supplies in your critical device with a stable, regulated, transient-free pure sine wave AC Power.
- 2.1.2 20KHz PWM sine-wave topology yields an excellent overall performance. The high crest factor of the inverter handles all high-inrush current loads without a need to upgrade the power rating.
- 2.1.3 Multi-functional LCD/LED panel may display various status of the UPS. The LED display may show UPS working status, Utility Status and UPS Abnormal status, in the mean while, the LCD display may show Input/Output Voltage, Frequency, Load Status, Inner cabinet temperature, and Abnormal Phenomenon.
- 2.1.4 To protect the unit from overloading, it automatically switches to bypass mode in 160seconds, app 40msec if loading is at 105%~ 150% of rating and in case of overloading at 150% of rating, it switches to bypass mode immediately. It will automatically switch back to inverter mode once overload condition ceases.
- 2.1.5 Should the output becomes short-circuit, the UPS holds the system and cuts the output automatically till the short circuit situation is removed manually.
- 2.1.6 Should the unit become overheated, the internal thermal Switch will detect the heat and switch to bypass mode and vice versa.
- 2.1.7 Fully digitalized control circuit built in the UPS may upgrade the functionality Of the UPS as well as reach a high-level protection of the UPS. Through powerful Communication capability built, it enhances its ability for remote control and monitoring easily.
- 2.1.8 Maintenance-free sealed-type battery minimizes after-sales service.
- 2.1.9 Providing four different working modes, such as Normal, ECO, CF50 and CF60, it may widely be used in a variety of applications.
- 2.1.10 DC-start function makes sure of the start-up of UPS during power outages.
- 2.1.11 Revolutionary battery management circuit analyzes battery discharging status to adjust battery cut-off point and extend the life of batteries.
- 2.1.12 Intelligent temperature-controlled fan may not only extend the life of the fan, but also reduce annoying noise because of sudden fan spin. It remains your office quiet and comfortable as usual.
- 2.1.13 When UPS is out of order, you may read out the possible fault reason from the LCD screen directly, which may reduce down unnecessary repair task a lot.
- 2.1.14 When UPS is out of order, you may read out the possible fault reason from the LCD screen directly, which may reduce down unnecessary repair task a lot.
- 2.1.15 In case the UPS is out of order, Fault status will be shown on the LCD screen
- 2.1.16 When the UPS is operated under CF50 or CF60 mode, the recommended load connected shall be 75% of rated capacity if the input voltage is 176~280Vac and 50% of the rated capacity if the input voltage is 160~280Vac

## **2.2. Symbols on the LCD Display Panel**

Item	Symbol	Description
1	<i>LINE</i>	Utility or Bypass Source
2		Battery Low
3		Battery Abnormal
4		UPS Overloading
5		UPS Working in specified mode*
6		A Blackout Transfer occurred in UPS Output
7		Bypass Input Abnormal, UPS fails to transfer to bypass, Bypass Abnormal at ECO mode
8		Utility Input Abnormal
9	<b>OFF</b>	UPS Shutoff
10	LINE    OFF	UPS Abnormal Lock
11		UPS Flow Chart
12		4 Digits Measurement Display
13		Indicate the item desired to be measured
14		UPS ON Switch or Alarm Silence
15		UPS OFF Switch
16		Previous Page or Setting Change
17		Next Page

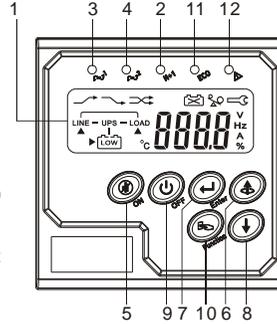
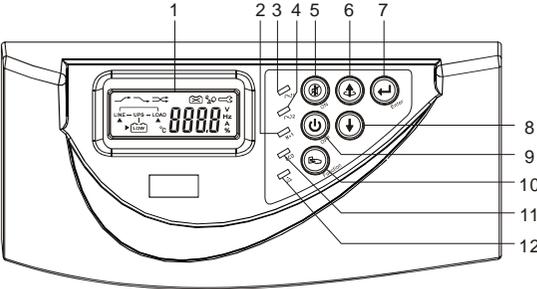
18		Special Function Log in /out
19		Enter or Reconfirmed
20		Utility Input Normal LED
21		Bypass Input Normal LED
22		UPS under Redundancy Mode
23		UPS under ECO Mode
24		UPS Fault or Abnormal Warning LED
25	<b>EPO</b>	Emergency Power Off
26	<b>Er05</b>	Battery Weak or Dead
27	<b>Er06</b>	Output Short Circuit
28	<b>Er10</b>	Inverter Over-current
29	<b>Er11</b>	UPS Overheat
30	<b>Er12</b>	UPS Output Overloading
31	<b>Er14</b>	Fan Error
32	<b>Er15</b>	Wrong Procedure to Enter Maintenance Mode
33	<b>Er16</b>	Output Parameters Set Error in Parallel System
34	<b>Er17</b>	ID Numbers are in conflict in Parallel System or ID number Error in single unit

35	<b>Er21</b>	Parallel communication error ( communication wire disconnected or failure to find ID1 UPS ) in parallel system
36	<b>Er24</b>	CVCF mode with Bypass input
37	<b>Er27</b>	The UPS must be operated in normal mode in parallel system
38	<b>Er28</b>	Bypass Overload Time out and cut off output.
39	<b>Er31</b>	The settings of both control board and driver board are not matched each other.
40	<b>Er33</b>	Isolated Transformer Overheat
41	<b>Er**</b>	Other Error code

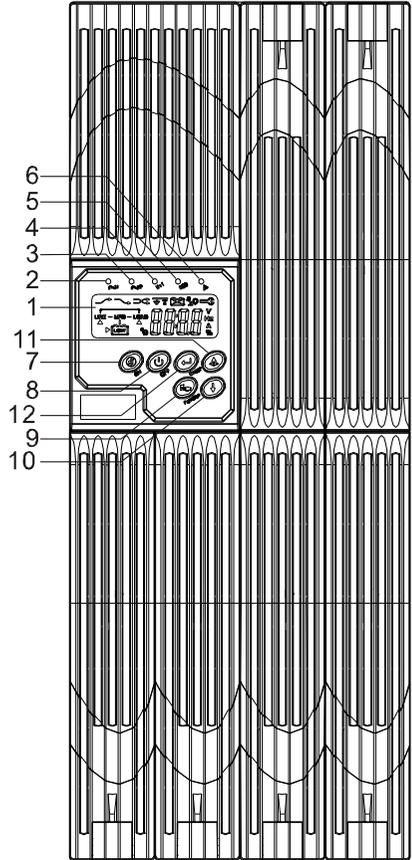
*\*The specified modes include Normal mode, ECO mode, CVCF mode, etc..*

## 2.3. Panel explanation

### 2.3.1 Front Panel Function Explanations

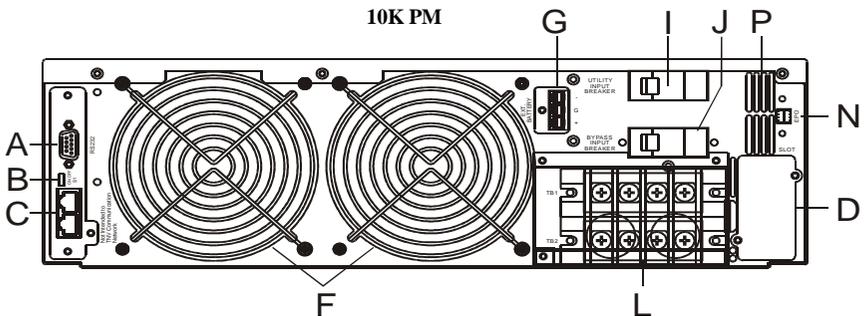
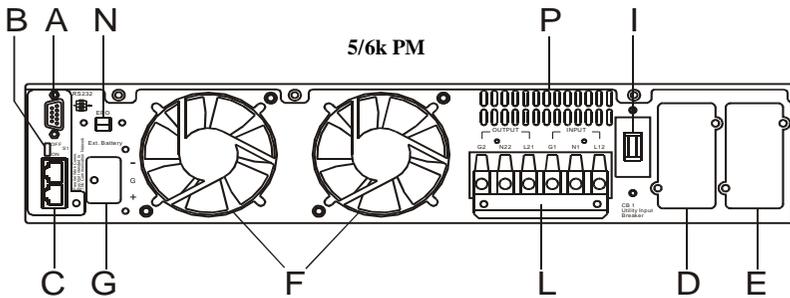
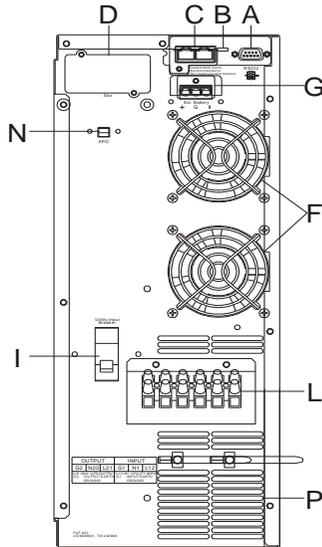


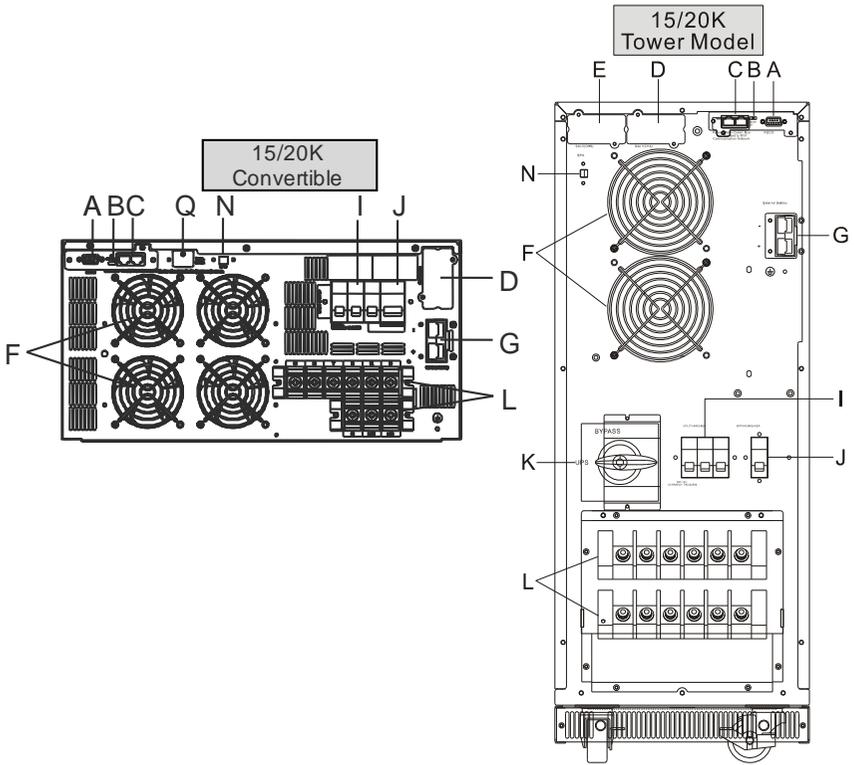
- ① LCD Display
- ② Green LED lights up to indicate the UPS has the capability to run under redundancy mode
- ③ Green LED steadily lights up to indicate that the Utility input voltage is within the window, the LED flashes flickeringly to indicate that the Utility input voltage is within the acceptable window.
- ④ Green LED lights up to indicate Bypass Input is normal.
- ⑤ UPS ON/Alarm Silence
- ⑥ Go to previous page or change the setting of the UPS
- ⑦ To re-confirm the change of UPS Setting
- ⑧ Go to next page
- ⑨ UPS OFF Switch
- ⑩ Special functions log in/out
- ⑪ UPS is working under ECO(Economic) mode
- ⑫ UPS Fault or Abnormal



### 2.3.2 Rear Panel Explanation

**5K/6K with batt  
Model**





- A RS232 Port
- B Terminal Resistor for Parallel function
- C CAN Bus Connection Port for Parallel System
- D Customer Options Slot 1
- E Customer Options Slot 2
- F Cooling Fan
- G External Battery Connector
- I Utility Input Breaker CB1
- J Bypass Input Breaker CB2 ( for Dual Input Model Only )
- K CAM Switch ( Maintenance Bypass Switch ) \*
- L Input/Output Terminal Block
- N EPO ( Emergency Power Off ) : Short to enable the function
- P Air Ventilation Hole
- Q Temp. Comp.

\*: Option

## 2.4. Communication Port Explanation

The Communication port on the UPS provides true RS232 type to communicate with UPS software to remote monitoring the power and UPS status.

With optional interfaces cards, which contains R2E(2<sup>nd</sup> RS232 plus EPO), RSE(RS485 plus EPO), USE(USB plus EPO), DCE(Dry Contact plus EPO), as well as SNMP/ card, you may combine them according to your demand. However, the R2E card, RSE card and USE card are prohibited to be used simultaneously.

The bundled software of the UPS is compatible with many operating systems such as Windows 98, & 2000, ME, NT and XP.

When the optional interface cards are used with onboard RS232 port in communication, the shutdown command at the DCE card & also the EPO signals will get the highest priority in control command, then the SNMP/WEB card, then R2E, RSE and USE get the lowest priority.

### 2.4.1 True RS232 type

#### 2.4.1.1 The RS232 interface settings

The RS232 interface shall be set as follows:

<b>Baud Rate</b>	<b>2400 bps</b>
<b>Data Length</b>	<b>8 bits</b>
<b>Stop Bit</b>	<b>1 bit</b>
<b>Parity</b>	<b>None</b>

#### 2.4.1.2 The Pin Assignments of true RS232 type

The Pin Assignments of true RS232 type are illustrated as follows:



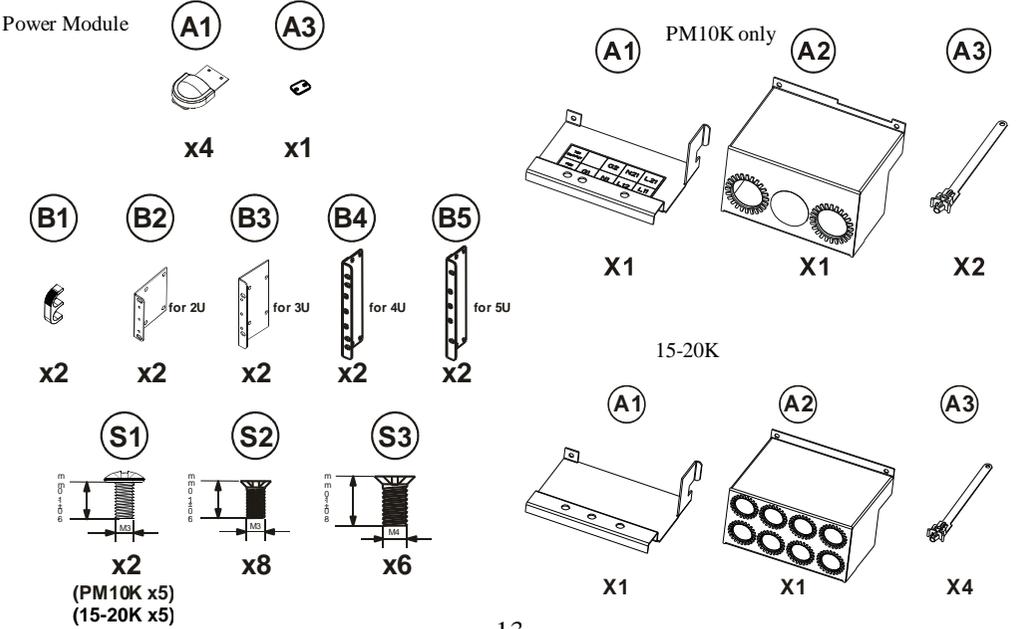
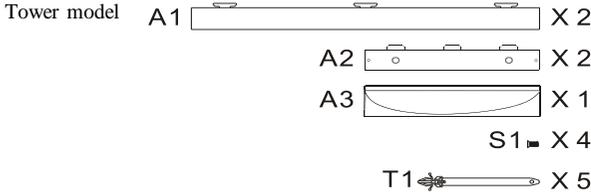
Pin 3: RS232 Rx  
Pin 2: RS232 Tx  
Pin 5: Ground

# 3 Installation and Operation

The packing condition and the external outlook of the unit should be inspected carefully before installation. Retain the packing material for future use.

## 3.1. Unpacking

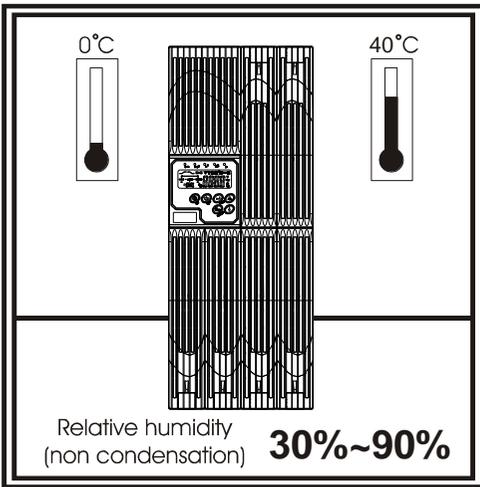
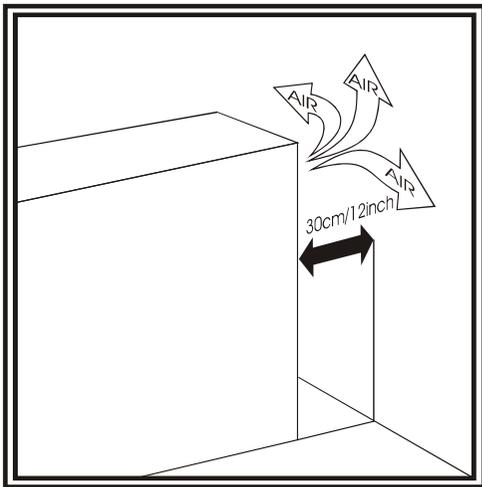
- 3.1.1 Unwrap the pack of UPS.
  - 3.1.2 Take the UPS out of the PE foam.
  - 3.1.3 Standard Package includes:
    - 1 set of Quick Start Manual
    - 1 set of User's Manual
    - 1 set of UPS communication software with RS232 cable
    - 1 set of accessories pack
  - 3.1.4 Package for the UPS with dual input:
    - Ditto, but with additional 1pcs wire No. 7.
- (p.s. Wire No. 7 is to be used at the input/output terminal block of the UPS. Please refer to Chapter 3.11 for installation.)



### 3.2. Selecting Installation Position

It is necessary to select a proper environment to install the unit, in order to minimize the possibility of damage to the UPS and extend the life of the UPS. Please follow the advice below:

1. Keep at least 30cm (12 inches) clearance from the rear panel of the UPS to the wall.
2. Do not block the air-flow to the ventilation openings of the unit.
3. Please check the installation site to avoid overheat and excessive moisture.
4. Do not place the UPS in an environment near dust, corruptive or salty material or flammable objects.
5. Do not expose the UPS to outdoors.



### 3.3. Installation of Accessories Kit

3.4.

3.5.

3.6. ONLY 15/20KVA  
TOWER MODEL

ONLY 5 TO 10KVA

3.7.

3.8.

3.9.

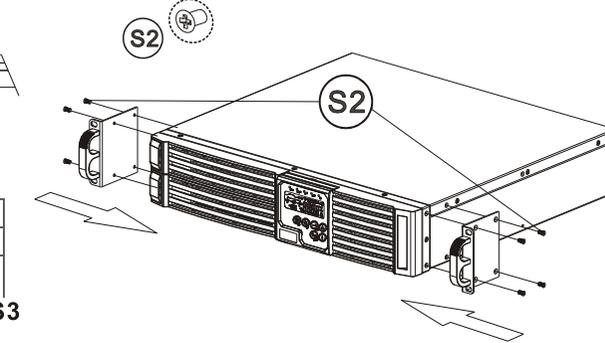
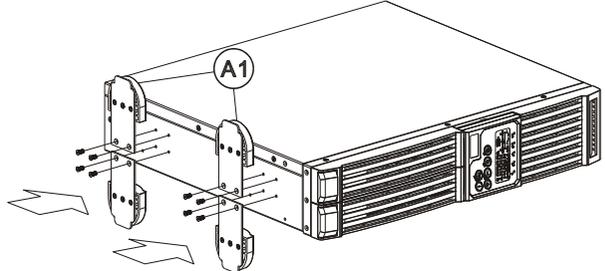
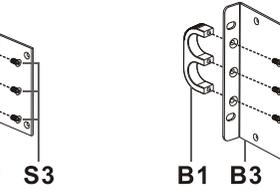
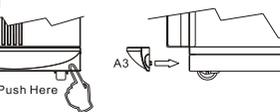
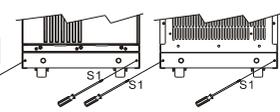
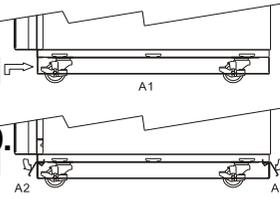
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Step 1

Step 2

Step 3

Step 4



S2

S2

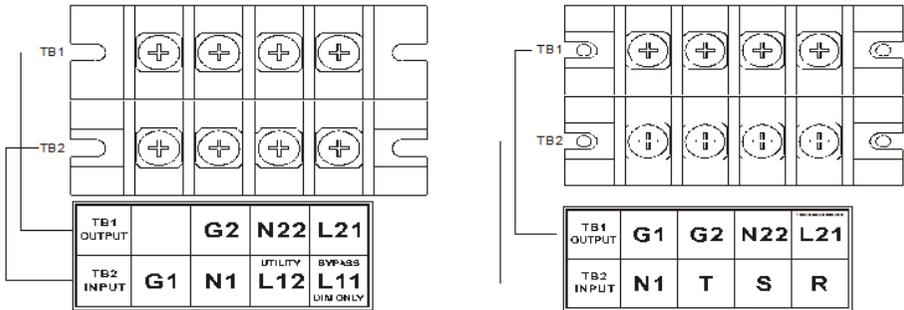
### 3.11. Terminal Block Explanation

### 3.12.

Rack 5/6K

OUTPUT			INPUT		
G2	N22	L21	G1	N1	L12
L21-N22: UPS OUTPUT G2 : OUTPUT EARTH GROUND			L12-N1: UTILITY INPUT G1 : INPUT EARTH GROUND		

Rack 10K



Rack 15/20K

INPUT						
<b>G</b>	<b>N</b>	<b>T</b>	<b>S</b>	<b>R</b>	<b>B</b>	
N-B : BYPASS INPUT (RM TYPE ONLY)			N-T-S-R : UTILITY INPUT			
G : INPUT EARTH GROUND						
OUTPUT						
<b>G</b>		<b>N22</b>			<b>L21</b>	
N22-L21 : UPS OUTPUT G : OUTPUT EARTH GROUND						

TOWER 15/20K MODEL

INPUT					
<b>G1</b>	<b>N1</b>	<b>T</b>	<b>S</b>	<b>R</b>	<b>B</b>
B-N1 : BYPASS INPUT (RM TYPE ONLY)			R-S-T-N1 : UTILITY INPUT		
G1 : INPUT EARTH GROUND					
OUTPUT					
<b>G2</b>	<b>N22</b>	<b>L22</b>	<b>N21</b>	<b>L23</b>	<b>L21</b>
N22, L22, N21, L23, L21 : UPS OUTPUT G2 : OUTPUT EARTH GROUND					

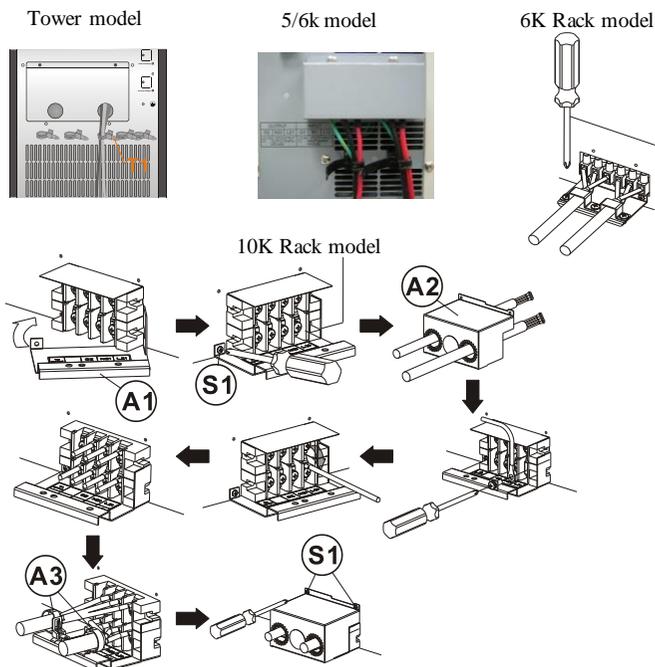
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- **L11-N1** 、 **B-N1**: The terminal for Bypass Input to provide the power source when the UPS is working under bypass mode
- **L12-N1** 、 **R-S-T-N1**: The terminal for Utility Input to provide the power source when the UPS is working under Utility mode
- **G1**: The terminal for UPS Input Ground
- **L21** 、 **L23** 、 **N21** 、 **L22** 、 **N22**: The terminals for UPS Output
- **G2**: The terminal for UPS Output Ground

**Remarks:**

1. The maximum current for each terminal is 30Arms for 5/6kVA, 50Arms for 10kVA and 100Arms for 15/20kVA.
2. If the UPS is DIM (Dual Input) type whose Utility and Bypass Sources are the same, L11 and L12 would have to be shorted for 1-phase input model, and short B and R for 3-phase input model.
3. If the UPS is SIM (Single Input) type, only AC source can be supplied to UPS from L12-N1 terminal for 1-phase input model and R-S-T-N1 terminal for 3-phase input model.
4. When the Isolation transformer is NOT installed into the tower type UPS, the UPS output terminals will be L22-N22..

- Use Mounting Cable Tie to fix cables.



6. Please refer to the specs of input current, output current and recommended conductors listed as below :

a. AC input and output (75°C minimum copper wire)

Model	Maximum Current	Conductor Section	Torque force
5/6KVA	33A	AWG #8	17.7/11 lb-in
10KVA	54.3A	AWG #6	23 lb-in
15KVA	30.2 A/83.3A(In/Out)	AWG #8/#4	
20KVA	39.85 A/111A(In/Out)	AWG #8/#4	

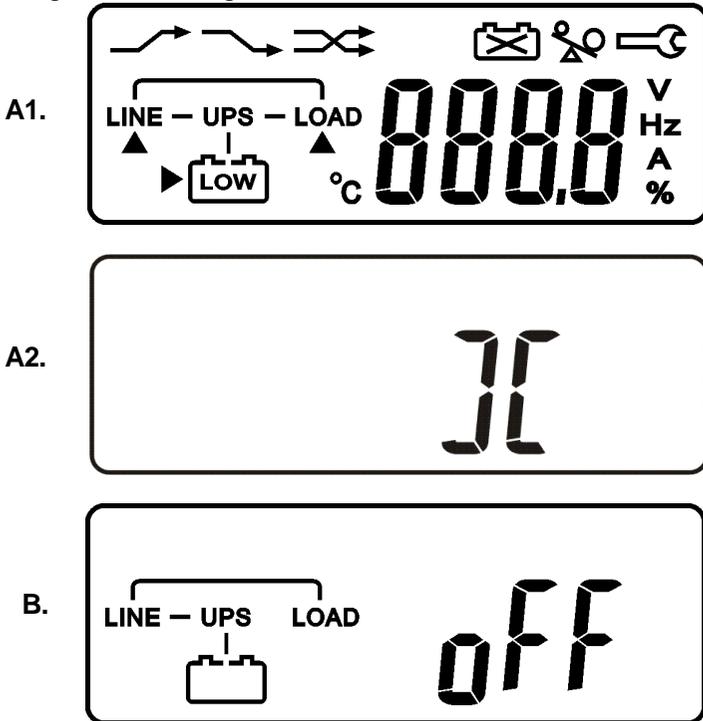
b. Battery input

Model	Maximum Current	Conductor Section
5/6KVA	25A	AWG #10
10KVA	41A	AWG #10
15KVA	62.5A	AWG #6
20KVA	83A	AWG #4

### 3.13. Operation Test and Installation Instruction

#### 3.13.1 Start Up in Normal Mode

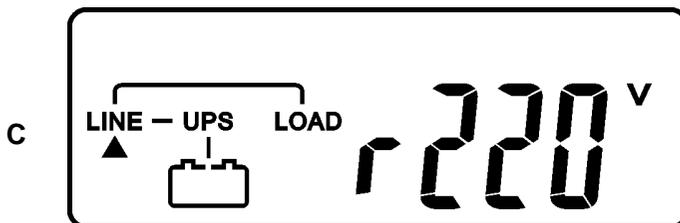
- 3.13.1.1 Open the terminal block cover on the rear panel (refer to 2.3.2) Before start the installation, please make sure the grounding is connected properly.
- 3.13.1.2 Make sure Utility breaker, UPS' Utility breaker is On "Off" position.
- 3.13.1.3 Make sure the voltage of Utility matches with the input voltage window of the UPS.
- 3.13.1.4 Connect the Utility separately to the terminal blocks of UPS' Utility and Bypass Inputs. Switch on the Power Breaker of the distribution panel and the breakers of the UPS' Utility and Bypass Inputs, and then the UPS starts up. Green LEDs  $\sim 1$  &  $\sim 2$  light up to show the Utility and Bypass Inputs are normal and the LCD display with parallel function will illustrate from drawing A1, drawing A2 to drawing B. Otherwise the LCD display will illustrate from drawing A2 to drawing B.



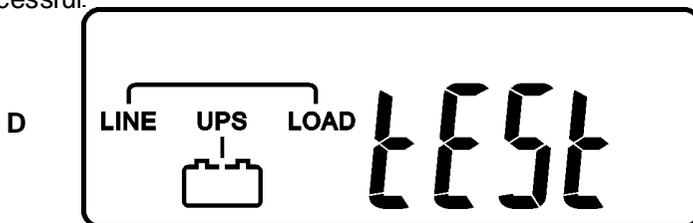
3.13.1.5 Then, the UPS is on Bypass Mode now and it will proceed self-test automatically. If there is no abnormal message occurred, it means the pre-startup of the UPS is successful and the charger starts to charge the batteries.

3.13.1.6 Press the UPS On Switch (Ⓞ) for approx. 3 seconds, then the Buzzer sounds twice and the LCD display changes from drawing B to drawing C.

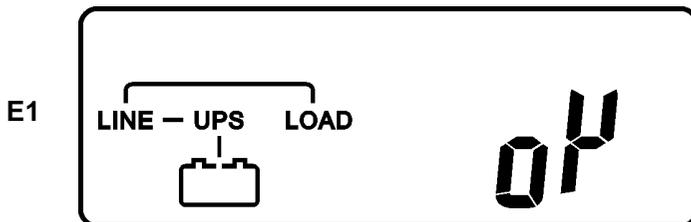
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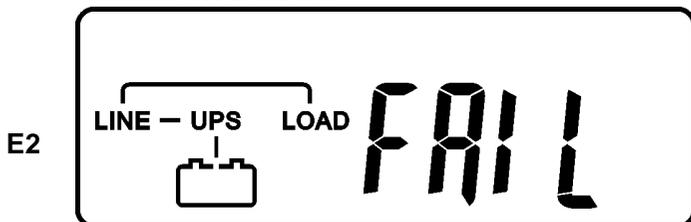
3.13.1.8 Then, the UPS is under self-test mode again, the LCD display will illustrate from drawing C to drawing D and remain approx. 4 seconds under battery mode, then illustrate from drawing E1 to drawing F if the self-test is successful.



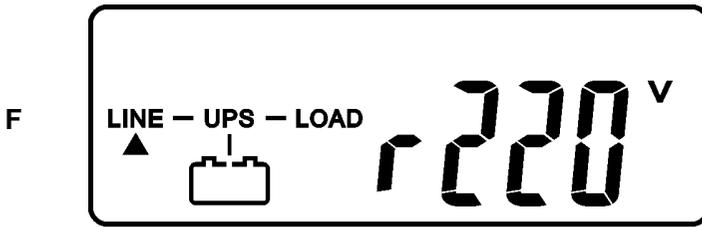
\* It shows "test".



\* It shows "OK" in self-test



\* It shows "Fail" in self-test

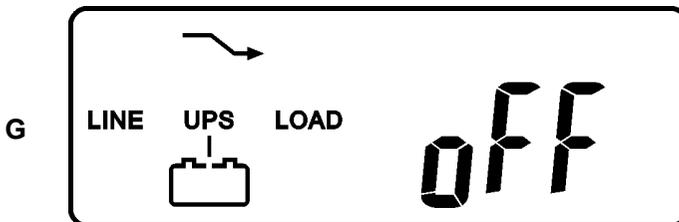


\* It shows "220Vac" in Utility Input.

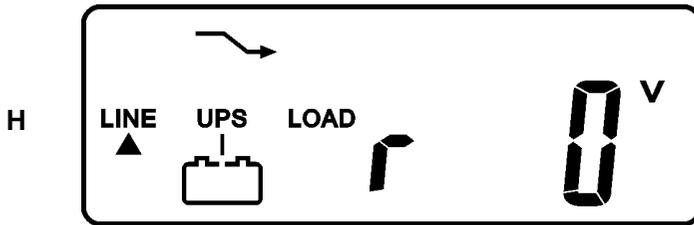
- 3.13.1.9 In case of failure in self-test, the LCD display will illustrate from Drawing D to drawing E2, then an error code or error status will be shown on the screen.
- 3.13.1.10 Your start-up operation of the UPS is completely now. Make sure the UPS is plugged onto the wall receptacle for charging at least 8 hours and the batteries of the UPS are fully charged.

### 3.13.2 Start-up in Battery Mode (Cold Start)

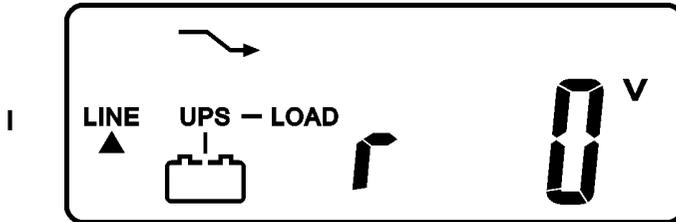
- 3.13.2.1 Make sure the UPS you have has already been installed at least 1 set(20pcs) of 12V/7AH or 12V/5AH batteries.
- 3.13.2.2 Push the UPS On Switch (ⓘ) once for approx. 5 seconds to awake the ups, and then the buzzer sounds twice. The LCD display will illustrate from drawing A to drawing G, and keep awake for approx. 15 seconds.
- 3.13.2.3 Press the UPS On Switch (ⓘ) of the UPS again for about 3 seconds till the LCD display illustrates from drawing G to drawing H, then the UPS will be in self-test Mode. The UPS may offer energy to the output in a minute, and the LCD display illustrates as drawing I. In case of failure in pushing the UPS On Switch in 15 seconds, the UPS will automatically turn off. You then have to go through step 3.13.2.1 to 3.13.2.3 once again.



\* It shows "Off", which means the UPS pre-start is successful.

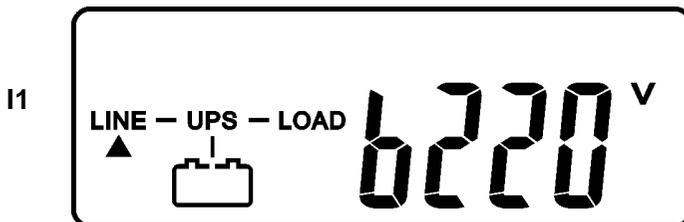


\* It shows Utility input is "0" and Utility Abnormal.

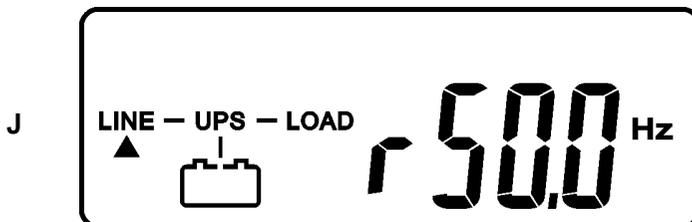


### 3.13.3 Check Measured Values & Figures detected by UPS

3.13.3.1 If you would like to check the measured values & figures detected by the UPS, please use scroll up  and scroll down  key pads. When you use scroll down key pad, the LCD display will illustrate as Drawing C(Voltage from Utility Input) → Drawing I1(Voltage from Bypass Input) → Drawing J(Frequency from Utility Input) → Drawing K(Frequency from Bypass Input) → Drawing L(UPS Output Voltage) → Drawing M(UPS Output Frequency) → Drawing N(UPS Output Load %) → Drawing O(UPS Battery Voltage) → Drawing P(UPS Inner Temperature).

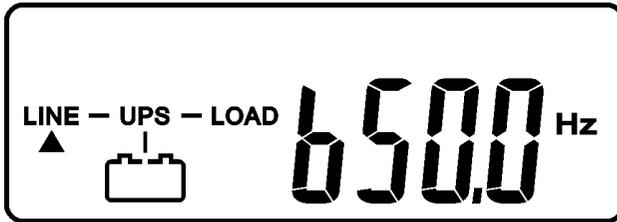


\* It shows voltage comes from Bypass Input



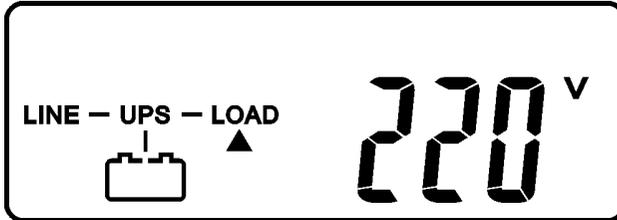
\* It shows frequency from Utility Input.

K



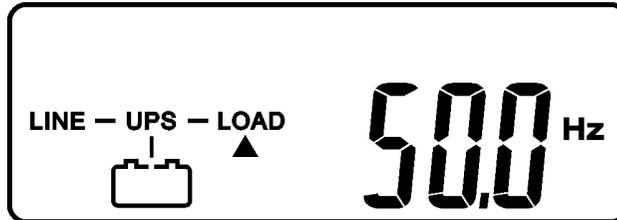
\* It shows frequency from Bypass Input.

L



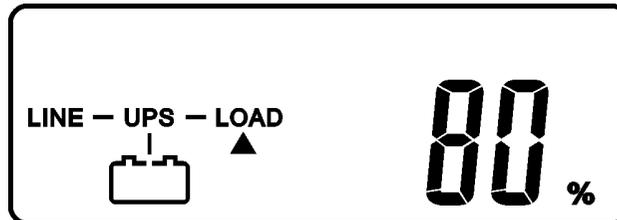
\* It shows UPS output Voltage.

M



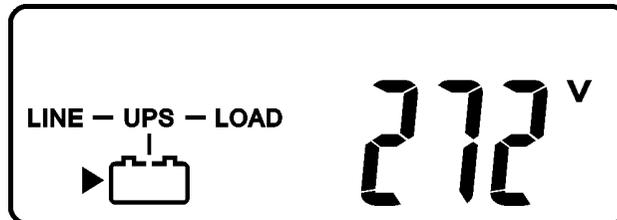
\* It shows UPS output frequency.

N

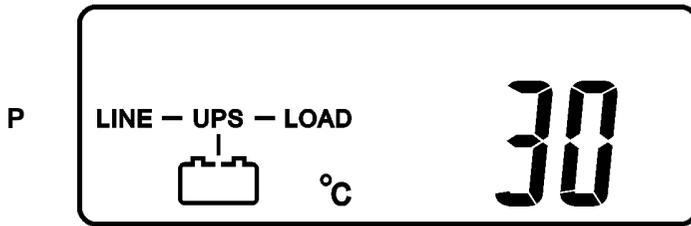


\* It shows UPS output load level(%)

O



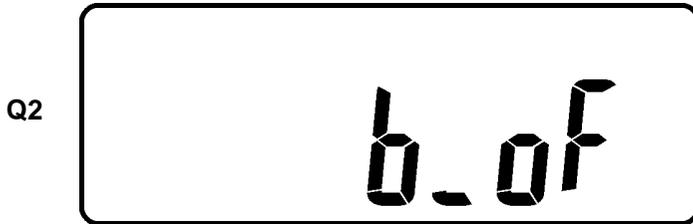
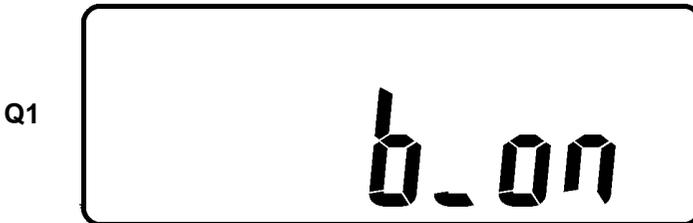
\* It shows Battery Voltage.



\* It shows UPS Inner Temperature

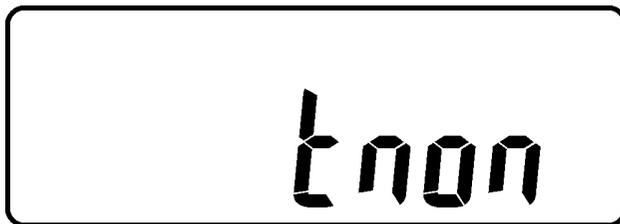
### 3.13.4 UPS Default Data and Special Function Execution

3.13.4.1 After UPS completely starts up, press  key pad to change the LCD display screen to drawing Q1.



3.13.4.2 Press  key pad to scroll down the screen and check the UPS settings. The LCD display will show in consequence between Drawing Q1(buzzer) → Drawing R1(Self-test) → Drawing S1(Bypass Voltage Windows) → Drawing T(Output Frequency Synchronization Window) → Drawing U(Inverter Output Voltage) → Drawing V1(UPS Operation Mode) → Drawing W(Output Voltage Micro Tune Value) → Drawing X(UPS Id) → Drawing Y(Parallel function status).

R1



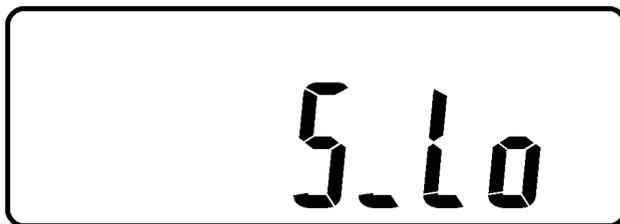
\* It shows self-test is NOT "on".

R2



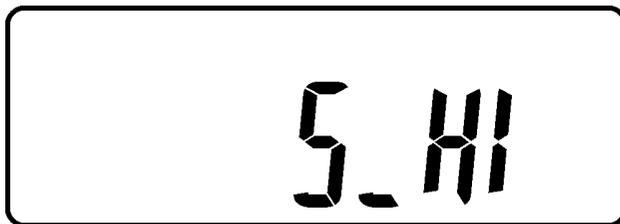
\* It shows self-test is "On".

S1



\* It shows Bypass Voltage is adjusted to narrow one.

S2



\* It shows bypass voltage is adjusted to wider one.

T



\* It shows Frequency Window is +/-3Hz.

U



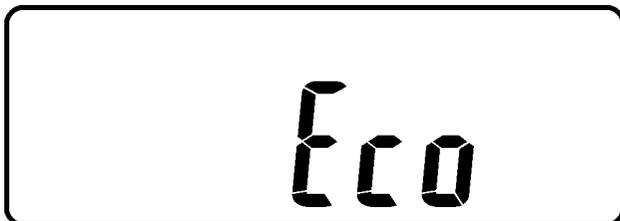
\* It shows inverter output voltage.

V1



\* It shows the UPS is operated in "normal mode".

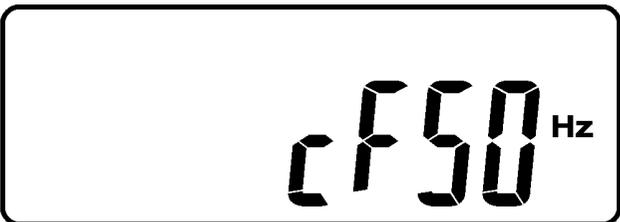
V2



UPS is operated in "Eco mode".

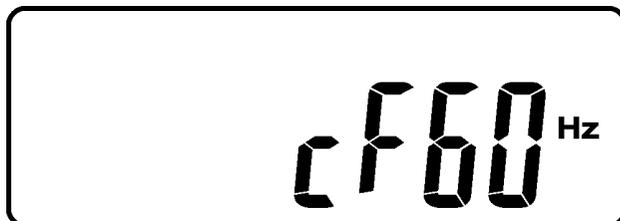
\* It shows the

V3



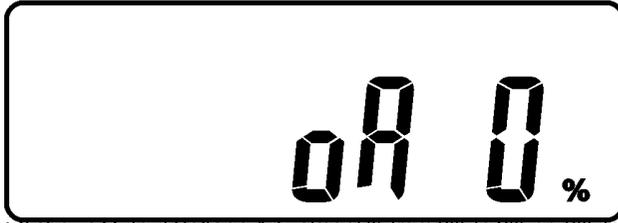
\* It shows the UPS is operated in "CVCF 50Hz mode".

V4



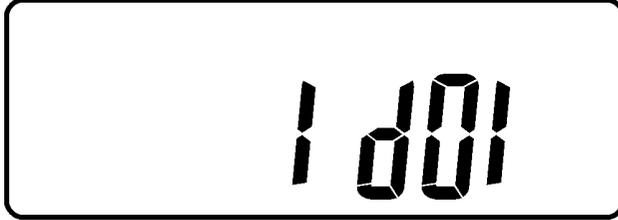
\* It shows the UPS is operated in "CVCF 60Hz mode".

W



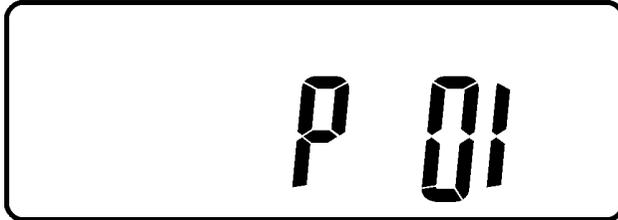
\* It shows Output Voltage Adjustment % from 0% to 3% or -0% to -3%.

X



\* It shows UPS Identification Number.

Y



\* It shows the UPS is in the No. 1<sup>st</sup> of parallel systems.

3.13.4.3 Press scroll up  key pad, you may execute special functions. The Functions includes buzzer ON (as drawing Q1), or buzzer OFF (as drawing Q2, Alarm silence for UPS Warning) and self-test OFF (As drawing R1) or self-test ON. (as drawing R2. UPS will execute battery test for 10 seconds. If the self-test is successful, it will show as Drawing E1; otherwise, it will show as drawing E2 & error message in the same time.)

### 3.13.5 UPS Default Settings and their alternatives

3.13.5.1 Make sure the UPS is not “On” yet. Press On Switch  and scroll down  key pads simultaneously for approx. 3 seconds, the buzzer will sound twice, the LCD display screen shows as drawing Q1, then the UPS is under setting mode now.

3.13.5.2 To scroll down the LCD screen, you may refer to Chapter 3.13.4.2

3.13.5.3 Except Buzzer(as drawing Q1 & Q2) and Self-test(as drawings R1 & R2), all the rest default settings may be changed by pressing scroll up  key pad.

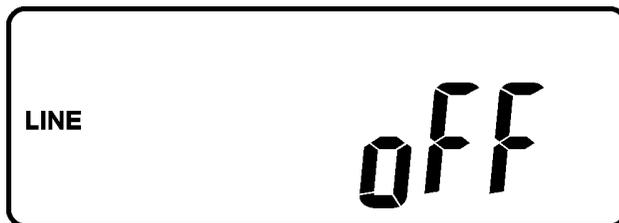
- 3.13.5.4 Drawings S1 and S2 mean the bypass input acceptable window, it can be 184Vac~260Vac or 195Vac~260Vac.
- 3.13.5.5 Drawing T means the bypass frequency window of the Inverter Output, the acceptable setting values are  $\pm 3\text{Hz}$  and  $\pm 1\text{Hz}$ .
- 3.13.5.6 Drawing U means the acceptable Inverter Output Voltage, of which voltage is 200Vac, 208Vac, 220Vac, 230Vac, or 240Vac.
- 3.13.5.7 Drawing V1, V2, V3 and V4 mean the operation modes of the UPS, of which alternative is Online, Eco(Economic) mode, fixed 50Hz Output or fixed 60Hz Output.
- 3.13.5.8 Drawing W means the adjustments of the Inverter Output, which may be calibrated as 0%, +1%, -1%, +2%, -2%, +3%, or -3%.
- 3.13.5.9 Drawing X means a specified address & position of the UPS when the UPS is in Parallel mode. The settable numbers are from 1st to 4th. The number must be 1<sup>st</sup> if the UPS is not in parallel.
- 3.13.5.10 Drawing Y means the parallel function status. The "P 01" means parallel function disabled and the "P02" means parallel function enabled.
- 3.13.5.11 When all the setting changes are done, you have to press enter  key Pad to save all the changes when the LCD screen shows as drawing Z, then, the LCD screen will show as drawing AA to complete the setting changes. If you don't want to change those settings, you may press "OFF"  key pads for 5 seconds, then the LCD screen turns to Drawing AA directly, which means your setting changes are invalid.

Z



\* Please press Enter key to save data.

AA



\* It shows the UPS is locked.

- 3.13.5.12 Turn Off the breaker of Utility Input.
- 3.13.5.13 Your Setting changes are complete.

### 3.13.6 UPS Is Off Due to Unknown Reason and Its Trouble Shooting

#### 3.13.7

3.13.7.1 If there is a serious abnormal condition occurred, the UPS will lock it itself in "OFF" position as shown in drawing AA and a abnormal message will show on the LCD screen.

3.13.7.2 After 3 seconds, all messages will be locked except Bypass messages(LED $\curvearrowright$ 2 & LCD  $\curvearrowright$ ). In case the Utility is abnormal after the UPS is locked, the LED $\curvearrowright$ 2 will be extinguished and the LCD $\curvearrowright$  will be shown on the LCD screen.

3.13.7.3 To release the UPS lock, please proceed the followings:

3.4.6.3.1. Check those error messages recorded.

3.4.6.3.2. Check to see Chapter 2.2 to trouble shoot the problem of the UPS. Otherwise, consult your local distributor for service.

3.4.6.3.3. Press Off  key pad for 5 seconds and buzzer will sound twice.

3.4.6.3.4. Turn Off the Breaker of Utility Input.

3.4.6.3.5. The UPS lock problem is solved now, but you shall contact with your Local distributor to make sure the error message shown is solved.

#### 3.13.8 Shut Off

3.13.8.1 Press Off  key pad for about 5 seconds, the Inverter output will be turned off, then the output load is supplied by Bypass loop and the LCD screen shows as drawing B.

3.13.8.2 Turn Off the breaker of Utility Input.

3.13.8.3 The UPS is turned off completely.

## 4 Troubleshooting Guide

### 4.1. Trouble Shooting

When the UPS malfunctions during operation, you may check the followings:

- Are the wirings of input and output correct?
- Is the input voltage of the Utility is within the input window of the UPS?

In case problems or symptoms still exist, please proceed the followings for proper adjustment. Should the problem persists, please contact your local distributor for help.

Situation	Check Items	Solution
UPS Red Fault LED lights up	<p>Check the error code shown on the LCD screen</p> <ol style="list-style-type: none"> <li>Er05,  &amp; </li> <li>Er06, Er10, Er12, Er28 &amp; </li> <li>EPO</li> <li>Er11, Er33</li> <li>Er14</li> <li>Er15</li> <li>Er16, Er27</li> <li>Er21</li> <li>Er24</li> <li>other error code</li> </ol>	<ol style="list-style-type: none"> <li>Check to see if the battery connection is properly done, then re-charge the batteries for 8 hours to see whether the UPS may backup normally; otherwise, consult your local distributor right away.</li> <li>If the CB3 is tripped, please turn off the UPS completely and keep the CAM switch at position INV before pressing CB3. Then remove some uncritical load at the UPS output end. If any damage of the coating of AC power cord, please replace a new one.</li> <li>Remove the short circuit occurred at the EPO terminal.</li> <li>Remove the objects blocked onto the ventilation holes.</li> <li>Check the cooling FANs on rear panel are working normally.</li> <li>Make sure the UPS is operated normally. If it is on CVCF mode, you have to turn off and turn on the UPS again.</li> <li>All of parameters except ID Number in the parallel UPS must be same. Please refer chapter 3.13.5 to set them again</li> <li>Reconnect the RJ-45 wire or set a UPS with ID=1.</li> <li>When the UPS is on CVCF mode, it is prohibited to have bypass input. You have to turn off the UPS and bypass input and re-start the UPS.</li> <li>Consult your local distributor for help.</li> </ol>

UPS fails to offer battery backup or its back up time is shorter than its calculation.		If the backup time is still too short after 8 hours of charge, please contact your local distributor for battery replacement.
UPS locks itself and it can not be turned off.		Please refer to chapter 3.13.6 to trouble shoot the problem; otherwise, consult your local distributor for help.

## 5 Bundled Software Installation Guide

### 5.1. Hardware Installation

1. Connect the male connector of RS232 cable to the UPS communication port.
2. Connect the female connector of the RS232 cable to a dedicated RS232 port of the computer.
3. For optional interface cards, you may refer to Chapter 6 for installation.

### 5.2. Software Installation

Please refer to the user's manual of the software for installation.

# 6 Customer Options Slots

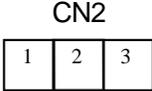
## 6.1. R2E (2nd RS-232) card

- 6.1.1 CN1 is for RS232 DB9
- 6.1.2 For communication protocol, please refer to Chapter 2.4.1
- 6.1.3 Installation Position: slot 1 (CHA-CN4) or slot 2 (CHB-CN5).



## 6.2. RSE (RS-485) card

- 6.2.1 CN1 is for the function of the terminal resistor. Short pin1-2 to enable the function and short pin2-3 to disable it.
- 6.2.2 CN2 for RS485 and CN3 for remote power.
- 6.2.3 Definition



- 1 → Ground
- 2 → A/Data+
- 3 → B/Data-

CN3



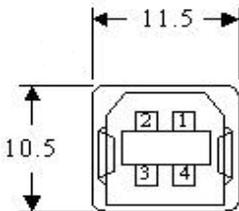
- 1 → AC+
- 2 → AC-



- 6.2.4 Installation Position: slot1.

## 6.3. USE(USB) card

- 6.3.1 CN1 for USB.
- 6.3.2 Definition
- 6.3.2.1 Comply with USB version 1.0,1.5Mbps
- 6.3.2.2 Comply with USB HID Version 1.0.
- 6.3.2.3 The Pin Assignments of the USE card:



- 1 → VCC (+5V)
- 2 → D-
- 3 → D+
- 4 → Ground

- 6.3.2.4 Installation Position: slot1 (CHA-CN3) or slot 2 (CHB-CN4)

## 6.4. DCE(Dry Contact)-B card

### 6.5.

6.5.1 The pin assignments of 10-Pin Terminal:

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

- Pin 1: UPS on Bypass mode.
- Pin 2: Utility Normal (Normal close contact)
- Pin 3: Utility Normal (Normal open contact)
- Pin 4: Inverter On
- Pin 5: Battery Low
- Pin 6: Battery Bad or Abnormal
- Pin 7: UPS Alarm
- Pin 8: Common
- Pin 9: Shutdown UPS positive(+ ) signal
- Pin 10: Shutdown UPS positive(- ) signal



6.5.2 The shutdown function will be activated, after a +6~-+25Vdc is put between pin9 and pin10 for 5 seconds.

6.5.3 The capacity of each relay contact is 40Vdc/25mA.

6.5.4 Installation Position: slot1(CHA-CN7) or slot 2(CHB-CN8).

6.5.5 Flexible signal output for N.C.(Normal close) or N.O.(Normal open) contact by shorting pin1-2 or pin2-3 from JP1-5.

6.5.6 The shutdown function will be enabled in 1 minute after blackout occurs if the pin1-2 of both CN1 and CN6 be shorted by cap. Or, the shutdown function can only be enabled by pin9-10 of CN3 if the pin2-3 of both CN1 and CN6 be shorted by cap. (Refer to 6.5.2)

## 6.6. SNMP Cards

6.6.1 *SNMP/WEB card*

6.6.1.1 For installation, please refer to the user's manual attached with the card. .

6.6.1.2 Position: slot 2(CHB).



6.6.2 Net Agent II Internal Card

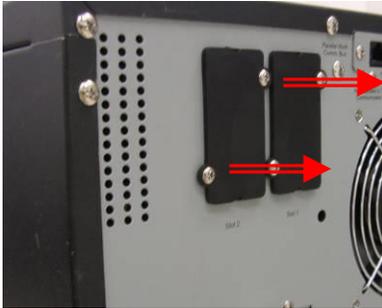
6.6.2.1 For installation, please refer to the user's manual attached with the card.

6.6.2.2 Position: slot 2(CHB).



## 6.7. Interface Card Installation

①



②



③



## 7 Specifications

MODEL Convertible	5-6kVA (1Φ)	10kVA (1Φ/3Φ)	15-20kVA (3Φ)
<b>INPUT</b>			
Voltage Window	160~280VAC (1Φ) / 277 – 485VAC (3Φ) *		
Frequency	45 ~ 65 Hz		
Phase/Wire	1Ph +N + G	3Ph +N + G	
Power Factor @ 100% linear load	0.99	0.95	
<b>OUTPUT</b>			
Voltage Window	220/230/240VAC		
Voltage Adjustment	±0%; ±1%; ±2%; ±3%		
Voltage Regulation	<1%		
Capacity	4.5KW/5.4KW	9KW	13.5/18KW
Rated Power Factor	0.9		
Wave Form	Sine Wave, THD<3%(no load to full load)		
Frequency Stability	±0.1%(Free Running)		
Frequency Synchronized Range	±1Hz to ±3Hz		
Transfer Time	0ms		
Crest Factor	3:1		
Efficiency (AC to AC, Normal)	Up to 90%	Up to 91%	Up to 93%
Efficiency (AC to AC, ECO)	Up to 97%		
DC Start	Yes		
<b>BATTERY</b>			
Quantity	20pcs	16 or 20pcs	
Voltage (VDC)	240V	192 or 240V	
Recharge Time	4-6h up to 90%		
<b>DISPLAY</b>			
Status On LED + LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, and Transferring with Interruption & UPS Fault		
Readings on LCD	Input Voltage, Input Frequency, Output Voltage, Output Current, Output Frequency, Load Percentage, Battery Voltage & Inner Temperature.		
Self-Diagnostics	Upon Power-on, Front Panel Setting & Software Control, 24-hour routine checking		

<b>ALARMS</b>				
Audible and Visual		Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions		
<b>PHYSICAL</b>				
Dimensions (HxWxD)mm	Power module	440x88x680	440x132x680	440x220x720
	With batteries	440x176x680	x	
Input/Output Connection		Hardwire		
External Battery Connection		Plug-in & Play		
Net Weight (Kgs)	Power module	25	(1Φ) 26Kg (3Φ) 28Kg	36
	With battery	53	x	
Heat Dissipation		< 450 W	< 600 W	<1350 W
Leakage Current		< 3mA at Full Load		
<b>MARKS</b>		CE		

\* (160~176Vac for 1-phase input model or 277~305Vac for 3-phase input model at <50% load)

\*\*\*These cards are not suitable to use simultaneously.

<b>MODEL TOWER</b>	<b>15K/20K</b>
<b>INPUT</b>	
Voltage Window	277-485 VAC (3Φ)
Frequency	45-65 Hz
Phase/Wire	3Ph + Neutral + Ground
Power Factor	Up to 0.95 at 100% Linear Load
<b>OUTPUT</b>	
Voltage Window	220/230/240 VAC
Voltage Adjustment	±0%, ±1%, ±2%, ±3%
Voltage Regulation	±2%
Capacity	13.5/18KW
Rated Power Factor	0.9 Lagging
Wave Form	Sine Wave, THD<3% (no load to full load)
Frequency Stability	±0.2% (Free Running)
Frequency Regulation	±1Hz, ±3Hz
Transfer Time	0 ms
Crest Factor	3:1 acceptable
Efficiency (AC to AC, Normal)	Up to 91%
Efficiency (AC to AC, ECO)	Up to 95%
DC Start	Yes
<b>BATTERY</b>	
Type	Sealed Lead Acid Maintenance Free

Quantity	20 pcs
Voltage	240 VDC
Recharge Time	6 hours to 90%
<b>DISPLAY</b>	
Status On LED + LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, Transferring with interruption, UPS Fault
Readings on LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage, Inner Temperature
Self-Diagnostics	Upon Power-on, Front Panel Setting & Software Control, 24-hour routine checking
<b>ALARMS</b>	
Audible and Visual	Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions
<b>PHYSICAL</b>	
Dimensions WxDxH (mm)	290x650x770
Input/Output Connection	Hard-wired
External Battery Connection	Plug-in & Play
Net Weight (kg)	62
Heat Dissipation	<1350 W
Leakage Current	< 3 mA at Full Load
<b>MARKS</b>	CE

\* (190-277 VAC for 3-phase input model at 0~50% load  
277-304 VAC for 3-phase input model at 50%>load<75%  
304-485 VAC for 3-phase input model at 75%>load<100%)