



UniStar P Series
6kVA Rack/Universal Mount

Models:
SC60021RM
SC60022RM

Parallel Redundancy/Capacity
On-Line UPS
User's Manual

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1 Important Safety Instruction

1.1. An Important Notice

For Parallel System installation, please refer to Parallel System Installation Guide Part number 003-2302

Because of “small leakage currents” generated by the EMI filter of the UPS, it is necessary to insure that the UPS is properly grounded before connecting AC power to the input.

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.

The UPS has its own internal energy source (battery). When the UPS is operating from battery power when no AC input is available, there will be voltage at the output terminals.

Make sure that the AC Utility power source is correctly grounded.

1.1.6 Do not open the case, as there are no serviceable parts inside. Your Warranty will be void.

Do not try to repair the unit yourself; contact your local supplier or your warranty will be void.

Make sure that the rated input voltage of the UPS matches the available AC mains voltage.

1.1.9 Use a certified input power cable with the correct plugs and sockets for the appropriate voltage system.

To eliminate any overheating of the UPS, keep all ventilation openings free from obstruction, and do not store anything on top of the UPS. Keep the UPS 12 inches away from the wall.

Make sure the UPS is installed within the proper environment as specified. (0-40°C and 30-90% non-condensing humidity)

Do not install the UPS in direct sunlight. Your warranty may be void if the batteries fail.

Install the UPS indoors as it is not designed for installation outdoors.

Dusty, corrosive and salty environments can do damage to any UPS.

Install the UPS away from objects that give off excessive heat and areas that are excessively wet.

If liquids are spilled onto the UPS, or foreign objects dropped into the unit, the warranty will be null and void.

The battery will discharge naturally if the system is unused for any length of time.

Recharge the batteries every 2-3 months if unused. If this is not done the warranty will be null and void. When installed and being used, the batteries will be automatically recharged and kept in top condition.

This UPS supports electronic equipment in offices, telecommunications, process control, medical and security applications. This UPS is NOT intended for use in the following application:

- 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.**

Do not install the UPS in an environment with sparks, smoke or gas.

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 turned off.

The UPS is equipped with a Maintenance Bypass Switch. Please follow the procedures strictly to switch on/off the Maintenance Bypass Switch.

The UPS offers CVCF (Constant Voltage Constant Frequency) setting function.

- a. For correct setting and wiring, please contact your local agent.**
- b. Do not attempt to configure the UPS for CVCF by yourself; otherwise your warranty will be void.**

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.

SAVE THESE INSTRUCTIONS - This Manual Contains Important Instructions that should be Followed during Installation and Maintenance of the UPS and Batteries.

Intended for Installation in a Controlled Environment.

CAUTION - A load disconnect switch shall be provided by others for the AC output circuit. To reduce the risk of fire, connect only to a circuit provided with branch circuit over-current protection for 30 amperes rating in accordance with the National Electric Code, ANSI/NFPA 70.

CAUTION - To reduce the risk of fire, connect only to a circuit provided with branch circuit over-current protection for 40 amperes rating in accordance with the National Electric Code, ANSI/NFPA 70.

Use No. 10 AWG, 60°C copper wire and 22.1 lb-in Torque force when connecting to terminal block.

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

True online architecture continuously supplies in your critical device with a stable, regulated, transient-free pure sine wave AC Power.

20KHz PWM sine-wave topology yields an excellent overall performance. High crest factor capability of the inverter handles all high-inrush current loads without a need to upgrade the power rating.

Multi-functional LCD/LED panel displays various conditions of the UPS. The LED display shows the UPS working status, Utility Status and UPS Abnormal status. The LCD display shows Input and Output Voltage, Frequency, Load Status, Inner cabinet temperature, and Abnormal conditions.

To protect the unit from overload, it automatically switches to bypass mode in 160 seconds~ 40ms if loading is between 105%~ 150% of rating. At 150% of rating, it switches to bypass mode immediately. The UPS will automatically switch the load back to inverter mode once the overload condition ceases.

If a short circuit is connected to the output the UPS will shut off the output voltage instantly. The output voltage will remain off until the short circuit is removed from the output.

Should the unit become overheated, the internal thermal Switch will detect the heat and switch to bypass mode. When the unit is cooled it will switch the load back to inverter automatically.

Fully digitalized control circuits built into the UPS enhance functionality while providing a high-level of protection of the UPS. Powerful Communication capability enhances its capability for remote control and monitoring.

Maintenance-free sealed-type battery minimizes after-sales service.

Built in maintenance bypass switch provides an easy and safe troubleshooting or maintenance function when the Utility is normal.

Providing four different working modes, such as Normal, ECO, CF50 and CF60, it may widely be used in a variety of applications.

DC-start function allows the UPS to be started during power outages.

Revolutionary battery management circuit analyzes battery discharging status to adjust battery cut-off point and extend the life of batteries.






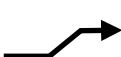
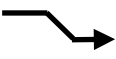






Intelligent temperature-controlled fan extends the life of the fan and reduces noise.

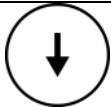

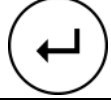
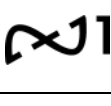
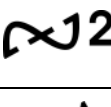
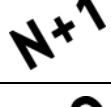
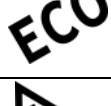

Built in diagnostics use fault codes, displayed on the LCD, to assist in finding the cause of a problem with the unit.

In case the UPS is out of order, Fault status will be shown on the LCD screen.

When the UPS is operated as a frequency converter under CF50 or CF60 mode, the recommended load connected shall be 75% of rated capacity if the input voltage is between 176~280Vac and 50% of the rated capacity if the input voltage is 160~280Vac.

2.2. Symbols on the LCD Display Panel

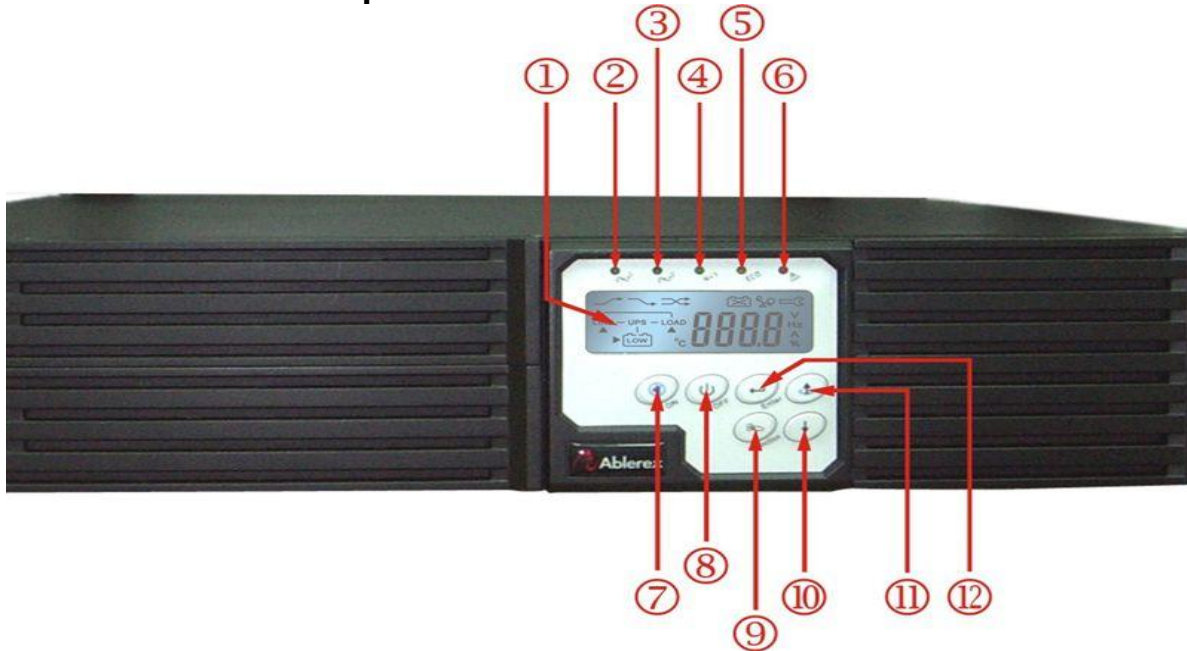
Item	Symbol	Description
1	2.2.1.1.1 <i>LINE</i>	Utility or Bypass Source
2		Battery Low
3	2.2.1.2 	Battery Abnormal
4		UPS Overloading
5		UPS Working in specified mode*
6		A Blackout Transfer occurred in UPS Output
7		Bypass Input Abnormal, UPS fails to transfer to bypass, Bypass Abnormal at ECO mode
8		Utility Input Abnormal
9	OFF	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	EPO	Emergency Power Off
26	Er05	Battery Weak or Dead
27	Er06	Output Short Circuit
28	Er10	Inverter Over-current
29	Er11	UPS Overheat
30	Er12	UPS Output Overloading
31	Er15	Wrong Procedure to Enter Maintenance Mode
32	Er24	CVCF mode with Bypass input
33	Er**	Other Error code

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

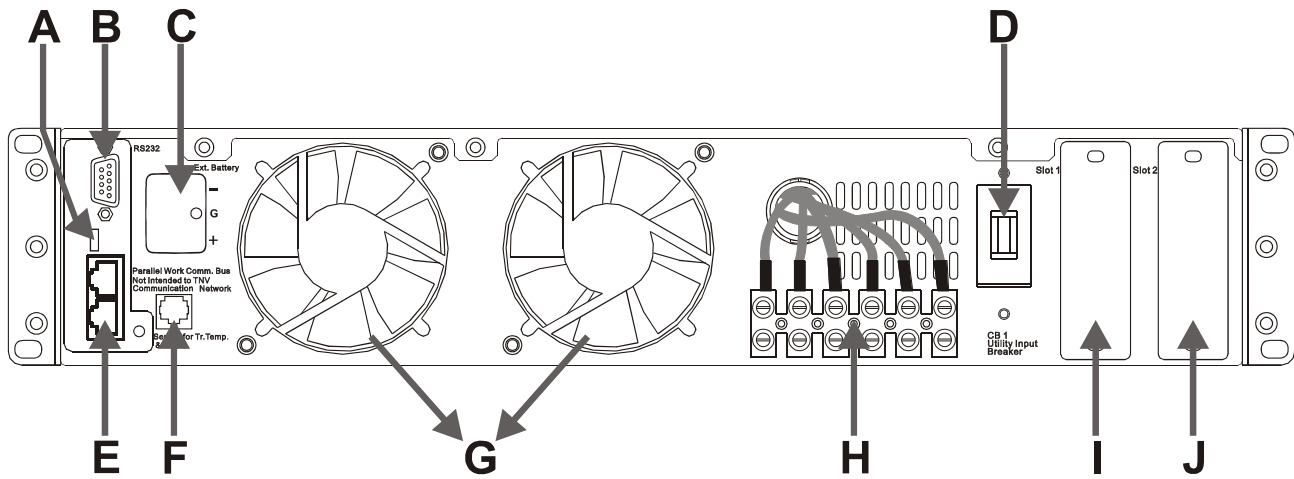
2.3. Panel explanation

Front Panel Function Explanations



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

Rear Panel Explanation



- A Terminal Resistor for Parallel function
- B RS232 Port
- C External Battery Connector
- D Utility Input Breaker
- E CAN Bus Connection Port for Parallel System
- F Maintenance Bypass Switch and Galvanic Tx. Temperature Sensor
- G Cooling Fan
- H Utility Input & UPS Output Power Connector Connection Port

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

- I Customer Options Slot 1
- J Customer Options Slot 2

2.4. Communication Port Explanation

The Communication port on the UPS provides RS232 protocol to communicate with UPS software for remote monitoring.

Available optional interfaces cards, which contains R2E (2nd RS232), RSE (RS485), USE (USB), DCE (Dry Contact), as well as SNMP/ card, can be added according to need. However, the R2E card, RSE card and USE card cannot be used simultaneously.

The bundled software of the UPS is compatible with many operating systems such as Windows 98, & 2000, ME, NT and XP. For other applications like Novell, NetWare, Unix, Linux, please contact your local distributor.

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

True RS232 type

2.4.1.1 The RS232 interface settings

The RS232 interface shall be set as follows:

Baud Rate	2400 bps
Data Length	8 bits
Stop Bit	1 bit
Parity	None

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

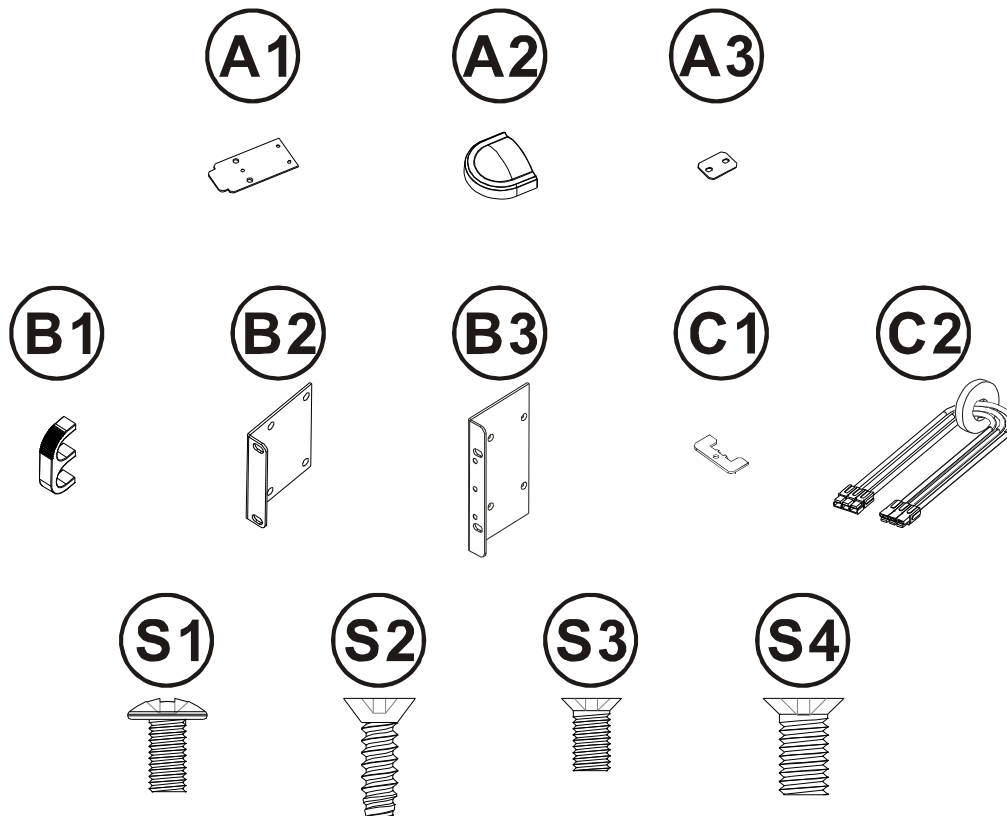
3.1. Unpacking

Take the UPS out of the PE foam.

Unwrap the UPS.

Standard Package includes:

- 1 set of User's Manual
- 1 set of UPS communication software with RS232 cable
- 1 set of Metal Accessories Kit as below:



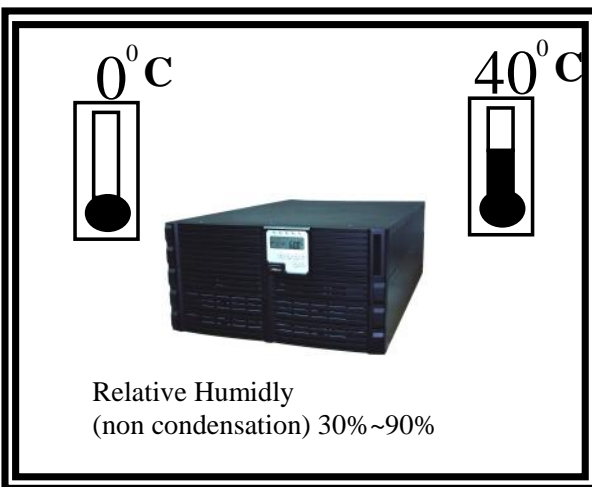
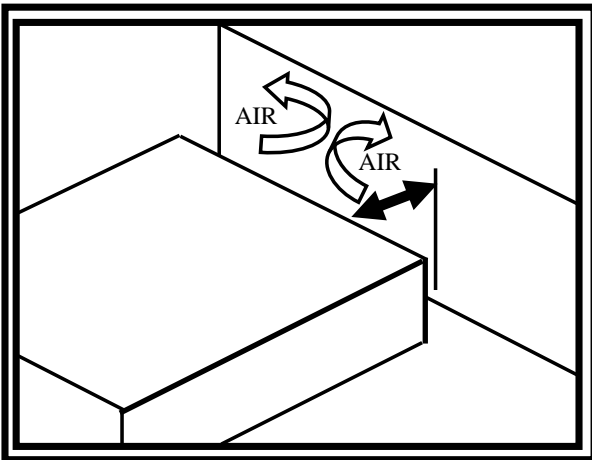
Package for the UPS with Isolation transformer and Maintenance Bypass Switch:

- 12 inches long NEMA L5-30P Input Cord and a 12 inch long, NEMA L5-30R.

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 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. Check the installation site to avoid overheat and excessive moisture.
4. Do not place the UPS in an environment near dust, corrosive or salty material or flammable objects.
5. Do not expose the UPS to outdoors.

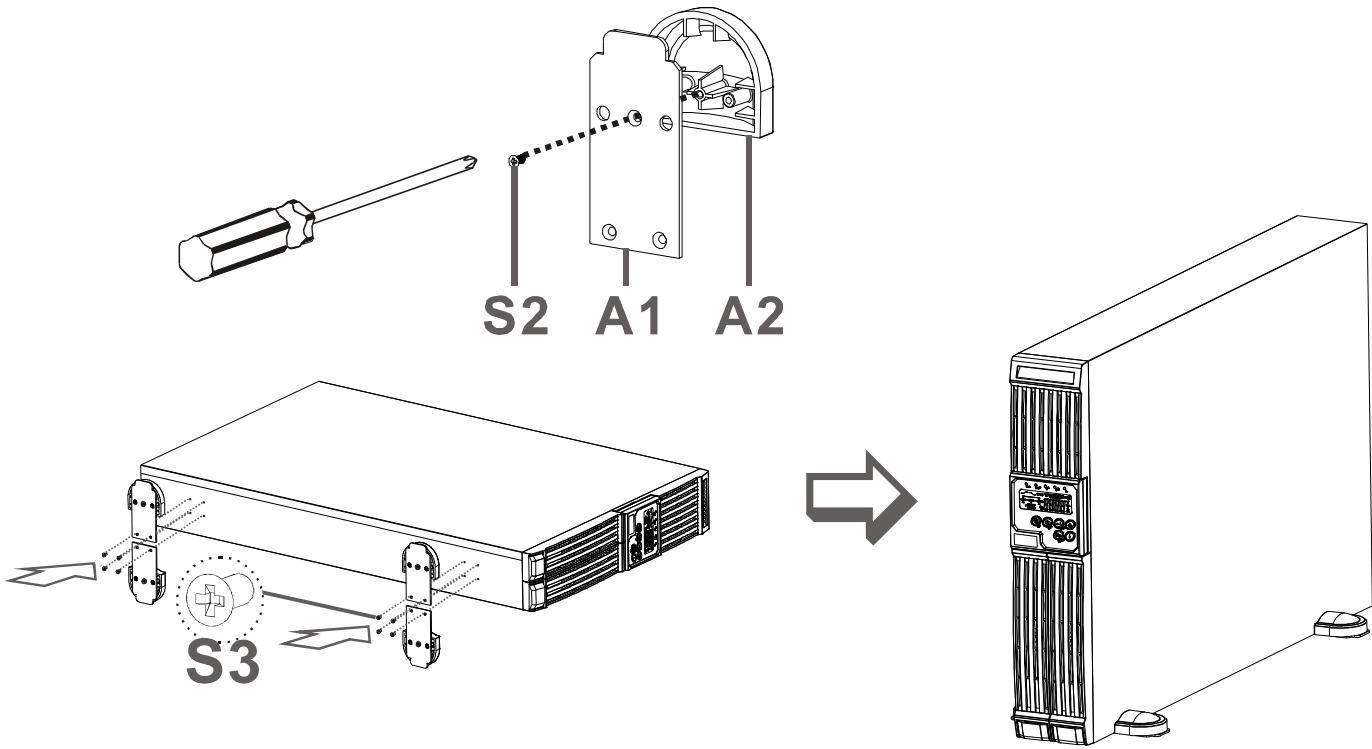


3.3. Installation of Casters Cover

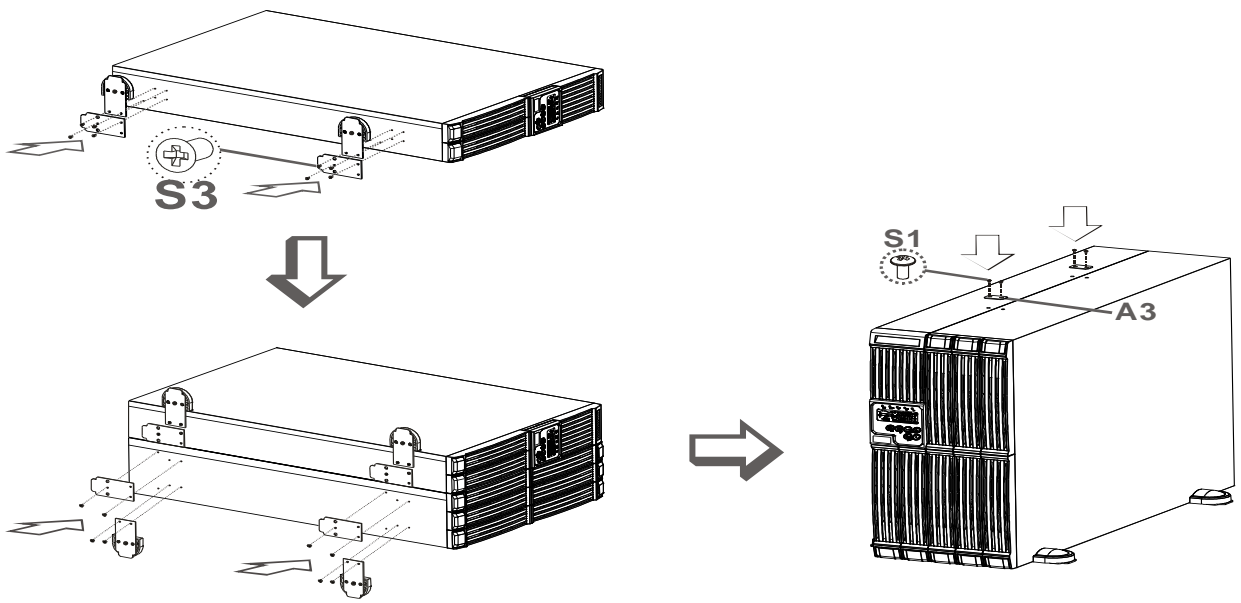
Tower installation step

3.3.1.1 Power Module + Battery Module

Step 1 Installation: Foot Cover and Power Module

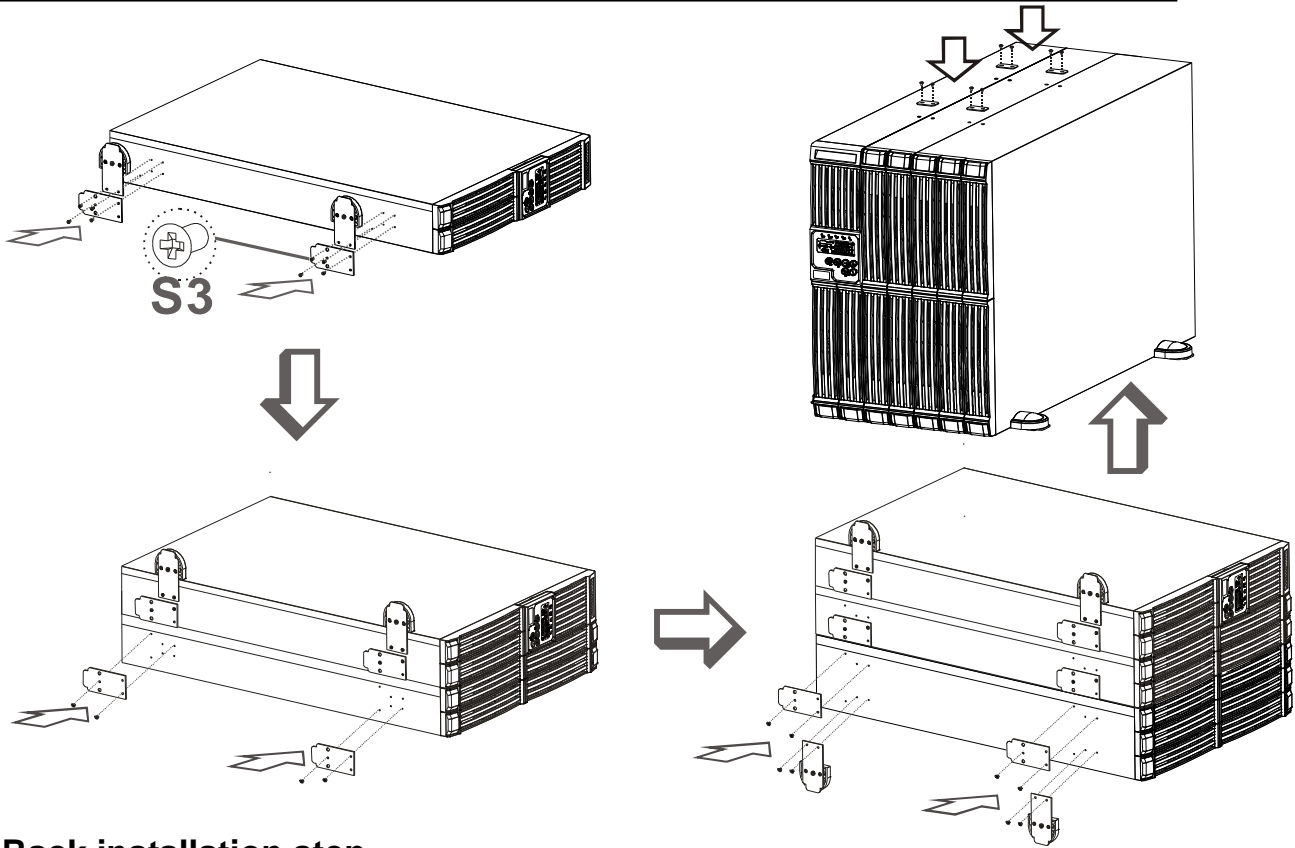


Step 2 Installation: Power Module and Battery Module



3.3.1.2 Power Module+ Isolation Transformer Module+ Battery Module

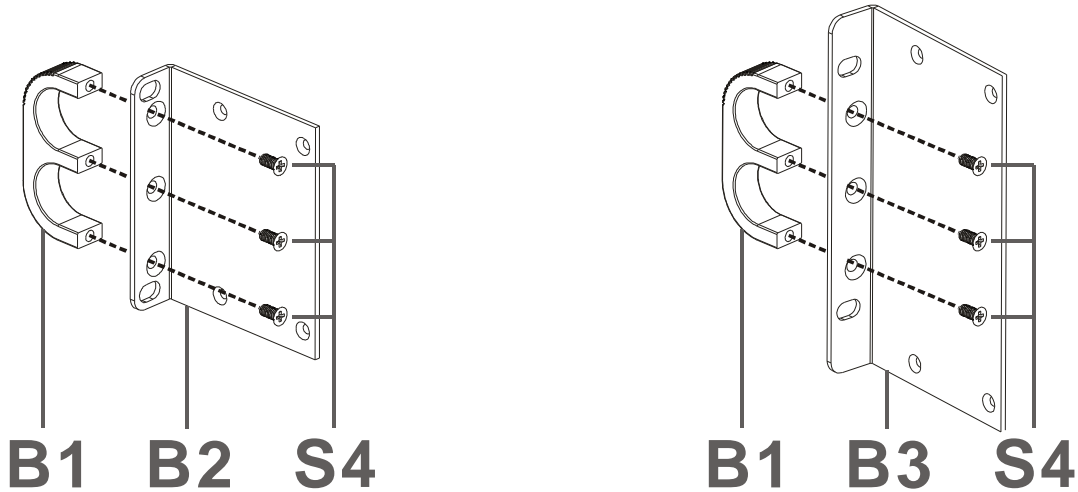
Step 1 Installation: Power, Isolation Transformer and Battery Module



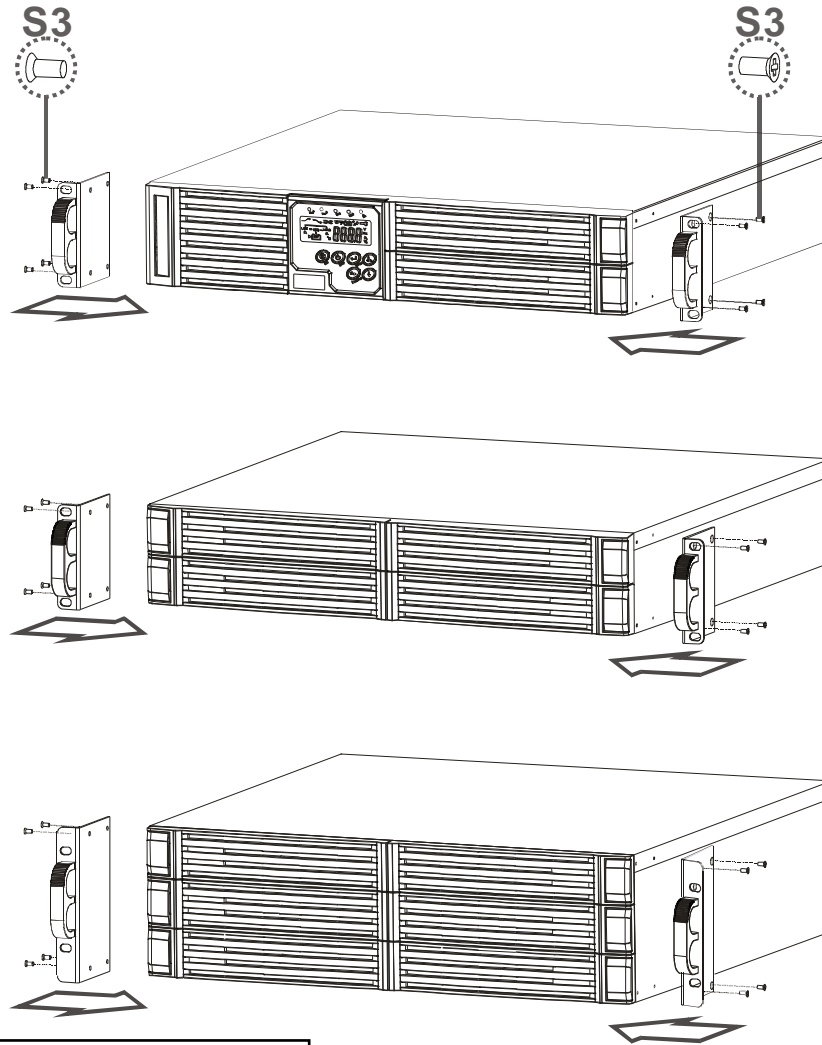
Rack installation step

3.3.1.3 Power Module+ Battery Module

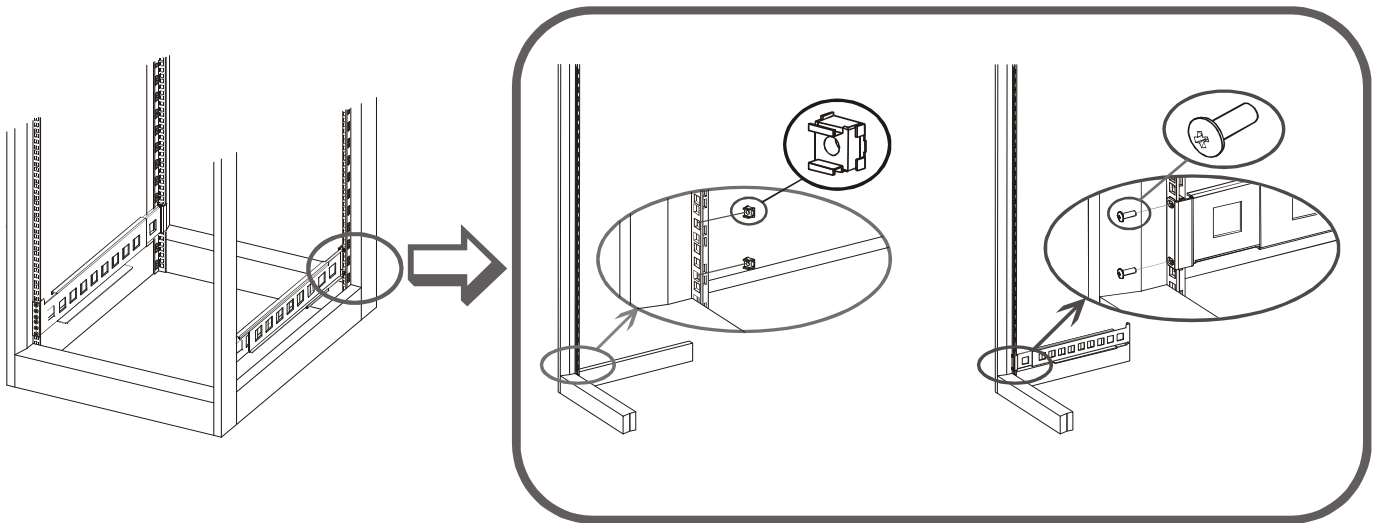
Step 1 Installation: Ear Cover



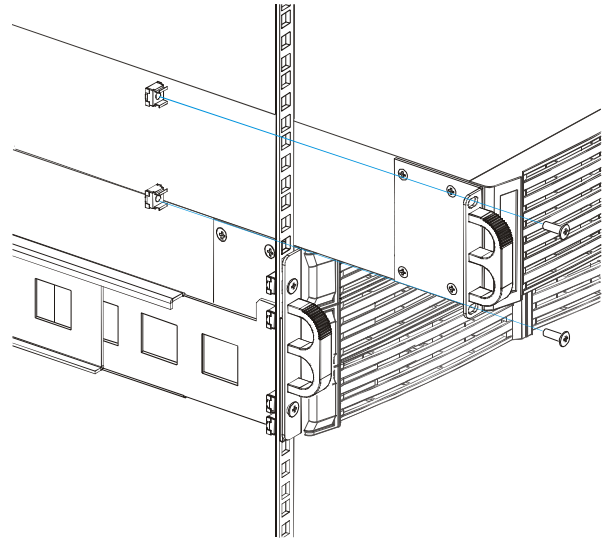
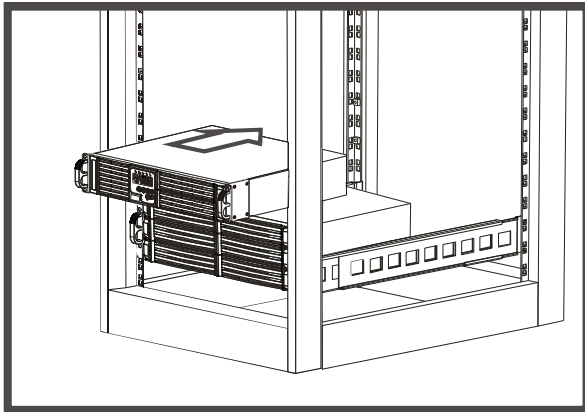
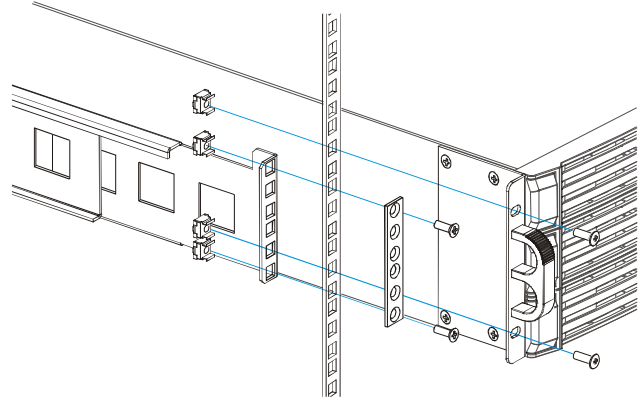
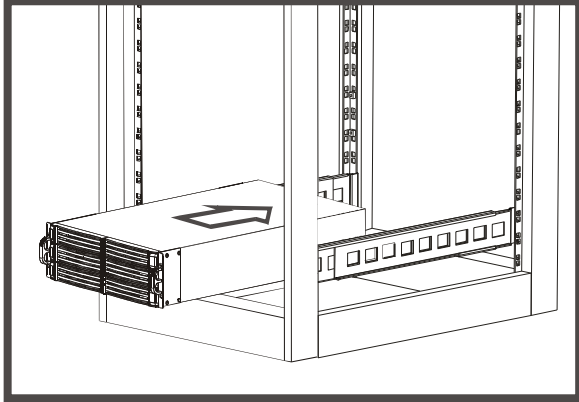
Step 2 Installation: Ear Cover to Power, Isolation Transformer and Battery Module



Step 3 Installation: Rail to Rack

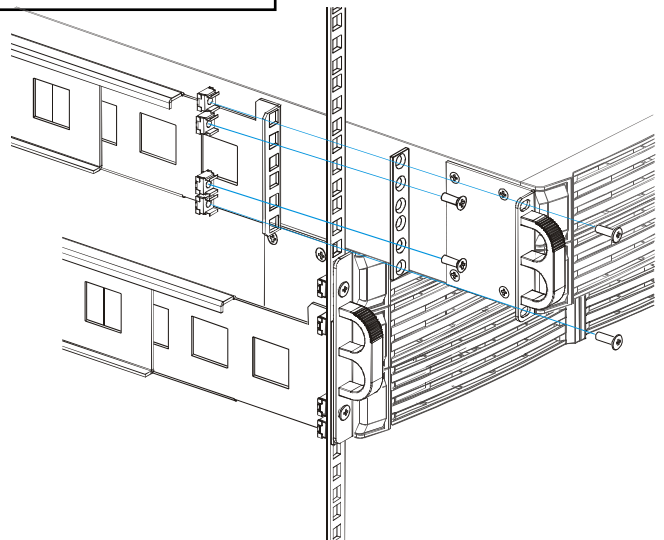
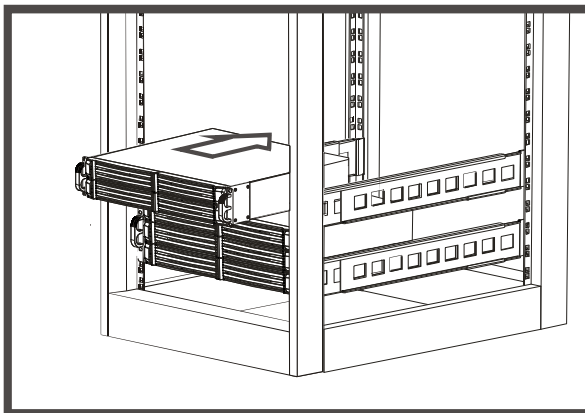


Step 4 Installation: Battery Module to Rail

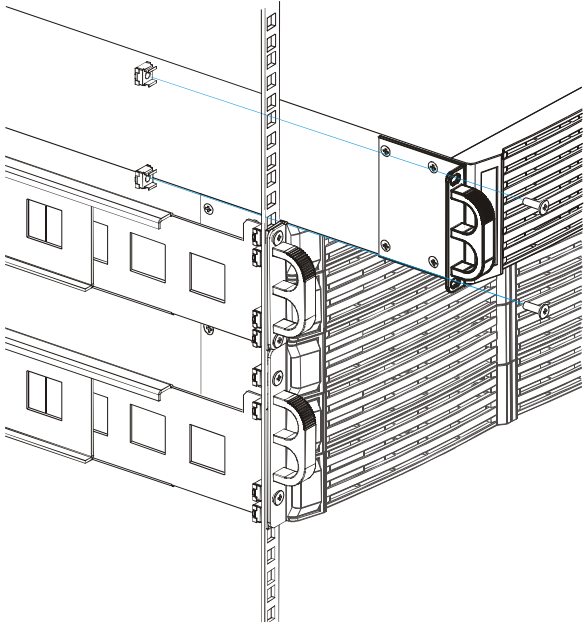
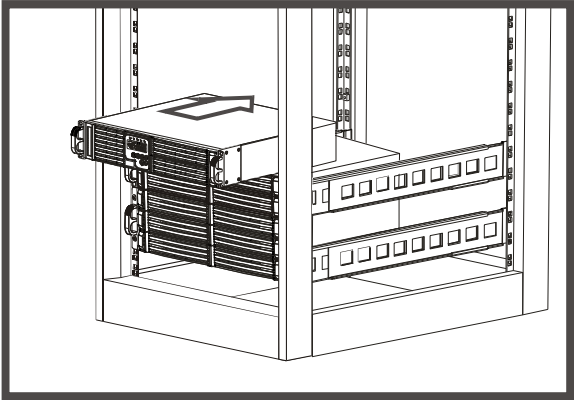


3.3.1.4 Power Module+ Isolation Transformer Module+ Battery Module

Step 1 Installation: Isolation Transformer Module to Rail



Step 2 Installation: Power Module to



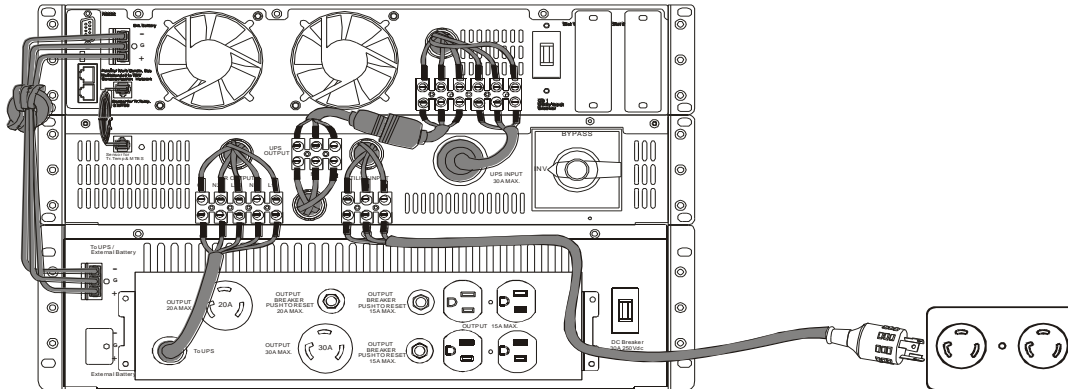
3.4. Terminal Block Explanation

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

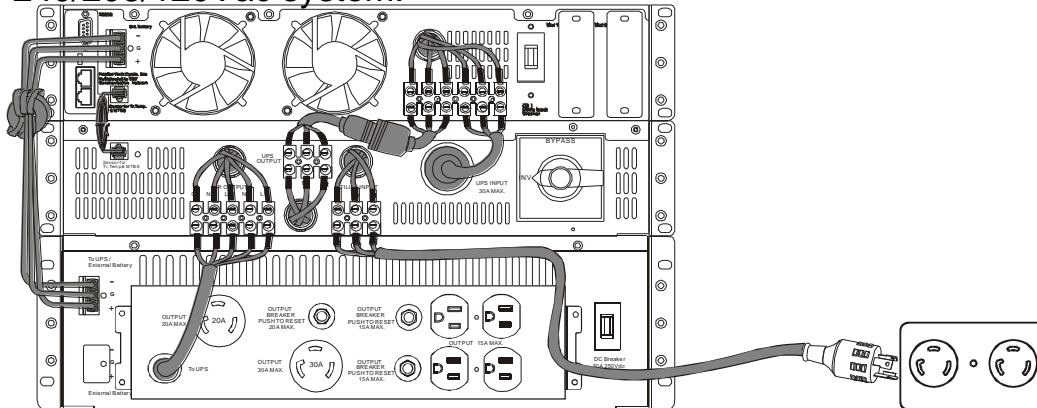
- L12-N1: Utility Input power when the UPS is running in Utility mode.
- G1: UPS Input Ground.
- L21, N22: UPS Output.
- G2: UPS Output Ground.

Remarks:

1. When the Isolation transformer and Maintenance Bypass Switch is installed:
 - a. For 200/100Vac, 220/110Vac, 230V/115Vac, or 240/120Vac system.



For 240/208/120Vac system.

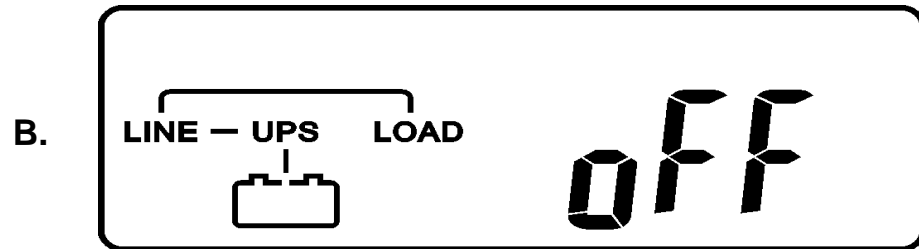
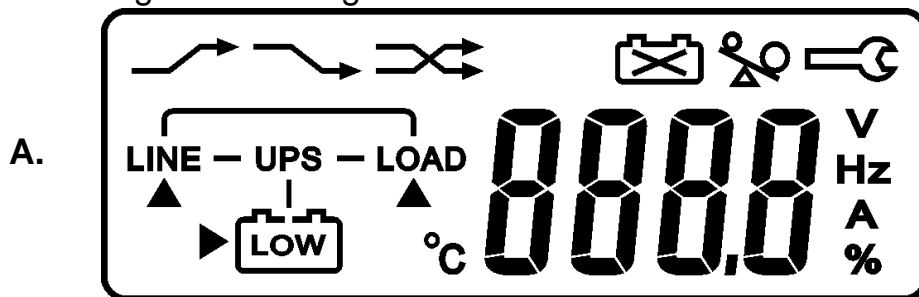



- Use Mounting Cable Tie to fix cables.

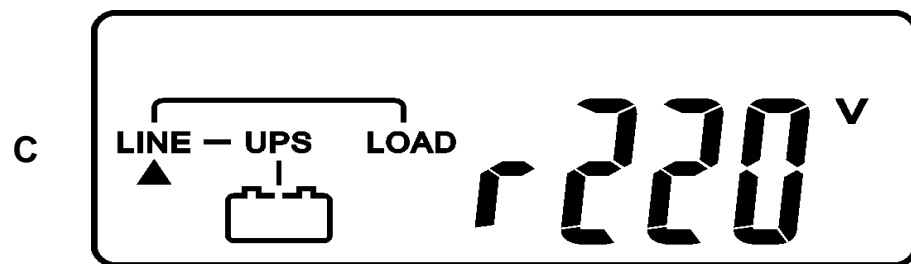
3.5. Operation Test and Installation Instruction

Start Up in Normal Mode

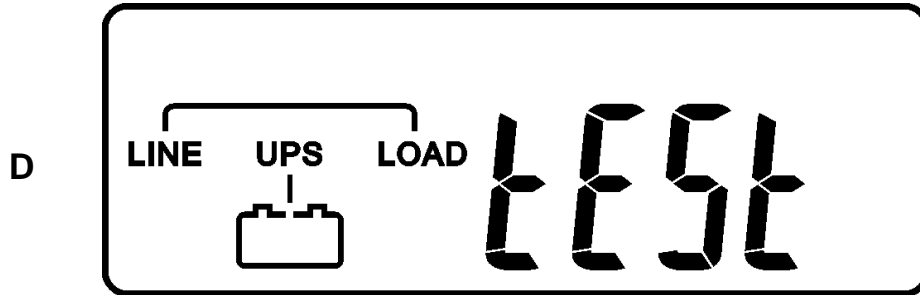
- 3.5.1.1 Open the terminal block cover on the rear panel (refer to 0). Before installation make sure the unit is properly grounded.
- 3.5.1.2 Make sure Utility breaker, UPS' Utility breaker is On "Off" position.
- 3.5.1.3 Make sure the Utility voltage matches the input voltage rating of the UPS.
- 3.5.1.4 Connect the utility and the bypass inputs and load to the terminal blocks according to the instructions in section 3.4. Apply power to the UPS and switch on the breakers of the UPS Inputs. The UPS starts and Green LEDs ≈ 1 & ≈ 2 light up to show the Utility and Bypass Inputs are normal and the LCD display with parallel function will display as shown in drawing A to drawing B.



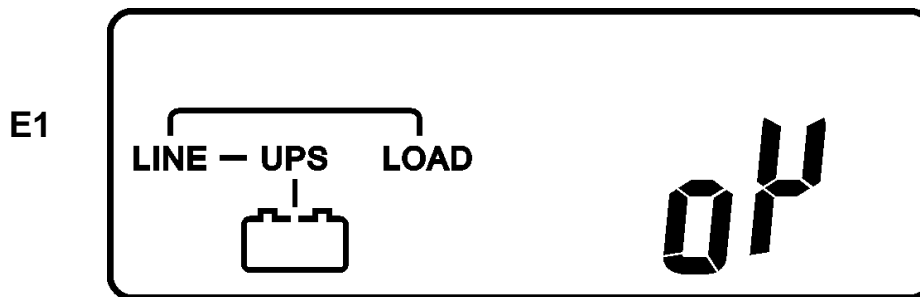
- 3.5.1.5 The UPS is now in Bypass Mode and it will proceed to self-test automatically. If there are no abnormal messages then the self-test was successful and the charger starts to charge the batteries.
- 3.5.1.6 Press the UPS On Switch  for approx. 3 seconds, then the alarm sounds twice and the LCD display changes from drawing B to drawing C.



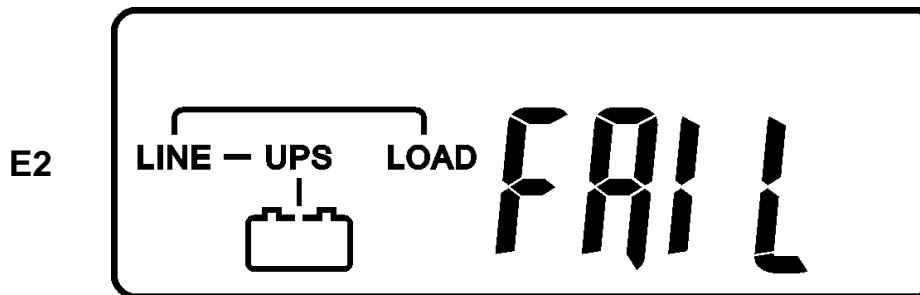
3.5.1.7 The UPS performs another self-test and the LCD display will change from drawing C to drawing D, running in battery mode for approx. 4 seconds, then the display will change from drawing E1 to drawing F if the self-test is successful.



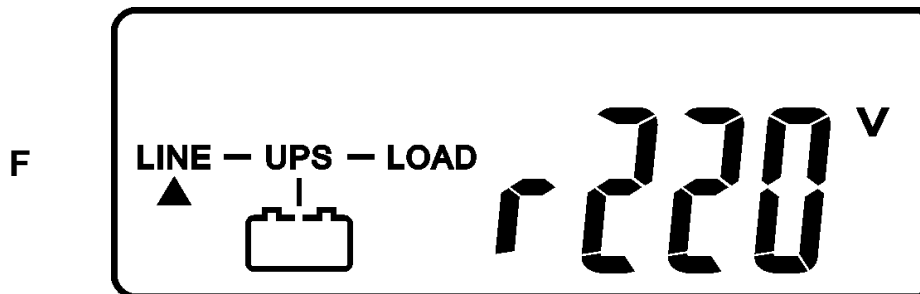
* Display shows "test".



* Display shows "OK" in self-test



* Display shows "Fail" in self-test





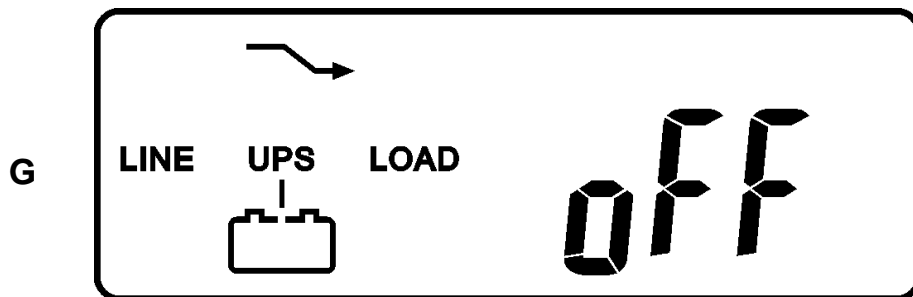
* Display shows "220Vac" in Utility Input.

3.5.1.8 If the UPS should fail self-test, the LCD display will change from Drawing D to drawing E2, then an error code or error status will be shown on the screen.

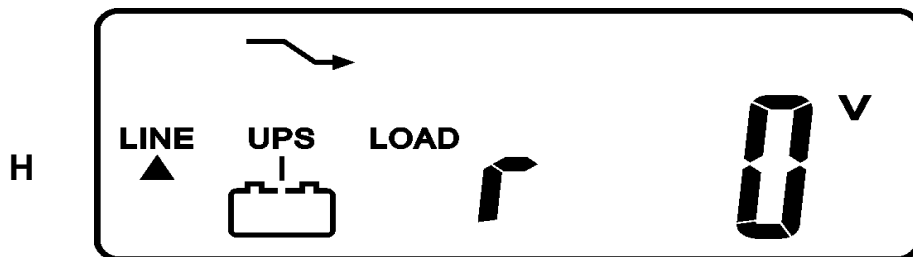
- 3.5.1.9 Start-up operation of the UPS is completely now. Make sure the UPS is plugged onto the wall receptacle for charging at least 8 hours and the batteries of the UPS are fully charged.

Start-up in Battery Mode (Cold Start)

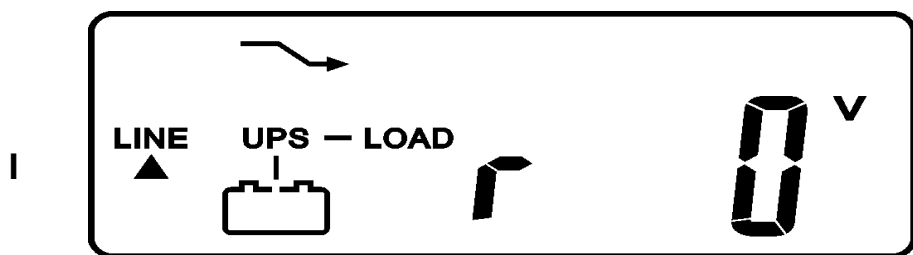
- 3.5.1.10 Make sure the UPS has a fully charged battery pack. At least 1 set (20pcs) of 12V/7AH or 12V/5AH batteries.
- 3.5.1.11 Push the UPS On Switch  once for approx. 5 seconds to initialize the UPS. The alarm sounds twice. The LCD display will illustrate from drawing A to drawing G, and stay on for approx. 15 seconds.
- 3.5.1.12 Within 15 seconds, press the UPS On Switch  again for about 3 seconds, until the LCD display changes from drawing G to drawing H, then the UPS will be in self-test Mode. The UPS will start the inverter to energize the output in approx. one minute, and the LCD display will show as drawing I. Failure to press the UPS On Switch within 15 seconds, will cause a failure to start and you will then have to repeat steps 3.5.1.10 to 3.5.1.123 once again.





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

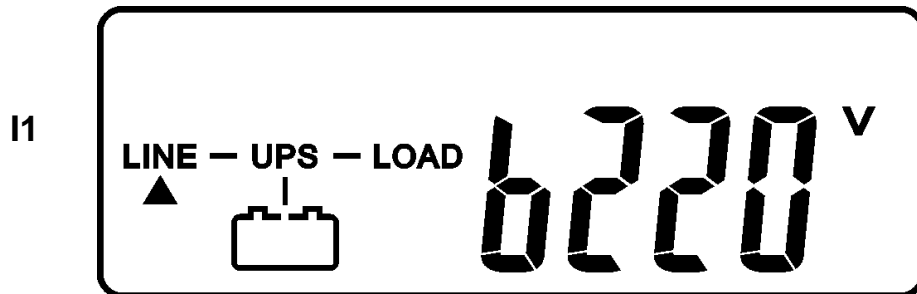


* Display shows Utility input is "0" and Utility Abnormal.

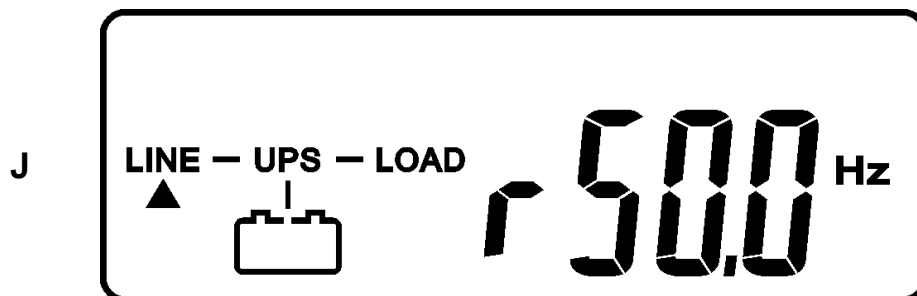


Check Measured Values & Figures detected by UPS

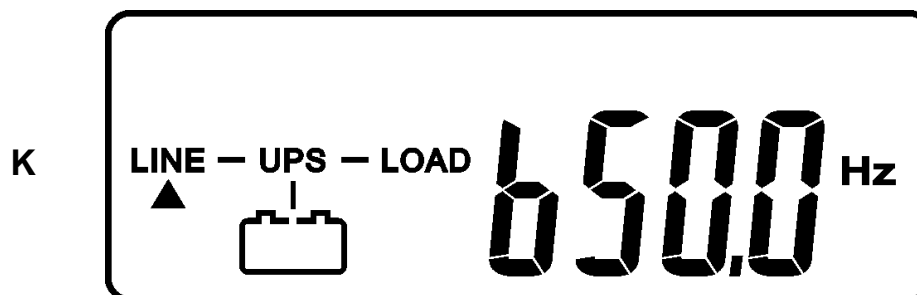
3.5.1.13 If you would like to check the operating parameters of the UPS, use the scroll down  and scroll up  key pads. When you use scroll down key pad, the LCD display will illustrate as Drawing C(Voltage from Utility Input) → Drawing I1(Voltage from Bypass Input) → Drawing J(Frequency from Utility 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).



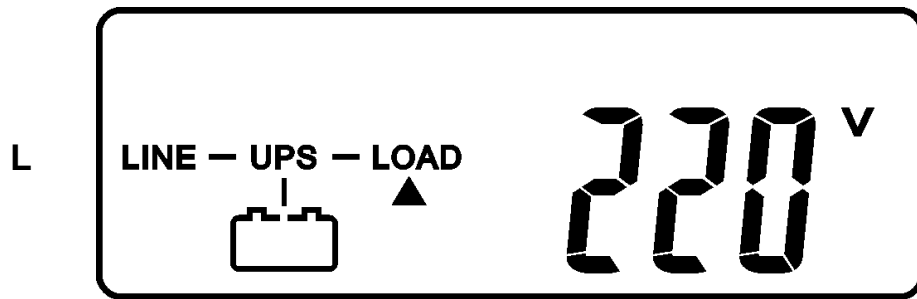
* Display shows voltage comes from Bypass Input



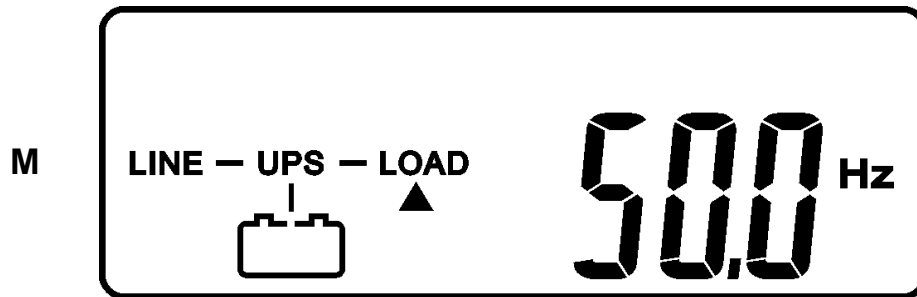
* Display shows frequency from Utility Input.



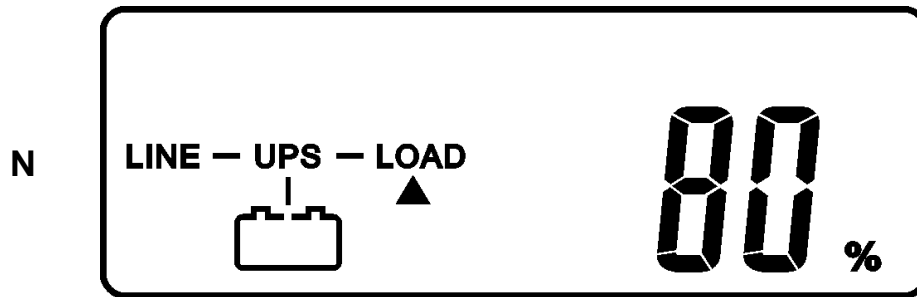
* Display shows frequency from Bypass Input.



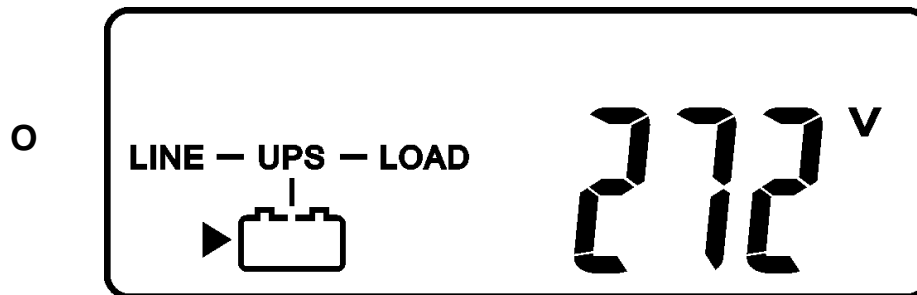
* Display shows UPS output Voltage.



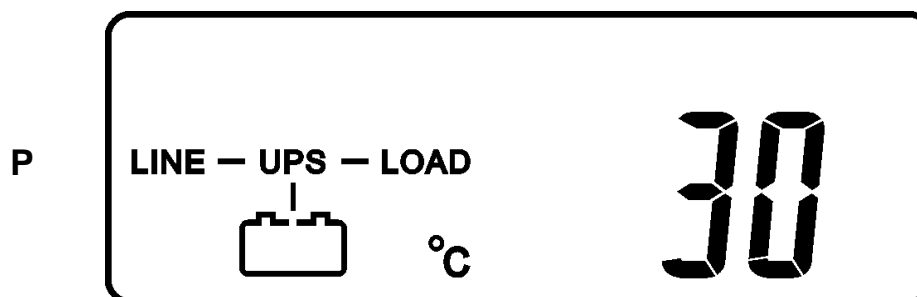
* Display shows UPS output frequency.



* Display shows UPS output load level(%)




* Display shows Battery Voltage.

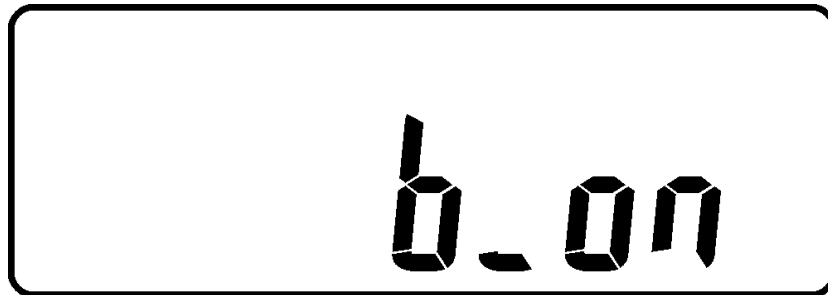


* Display shows UPS Inner Temperature

UPS Default Data and Special Function Execution

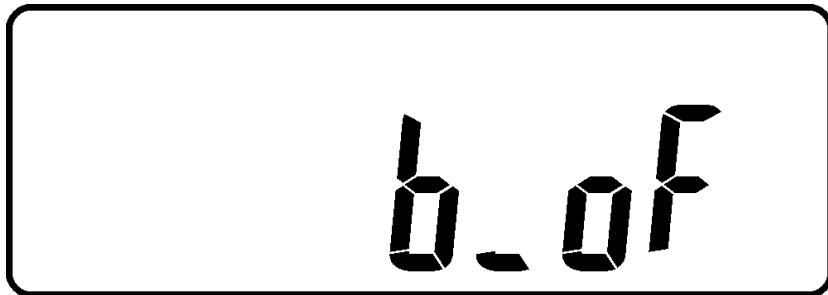
3.5.1.14 After UPS completely starts up, press  key pad to change the LCD display screen to drawing Q1.

Q1



* Display shows alarm (b for buzzer) "On".

Q2




* It shows buzzer "Off".

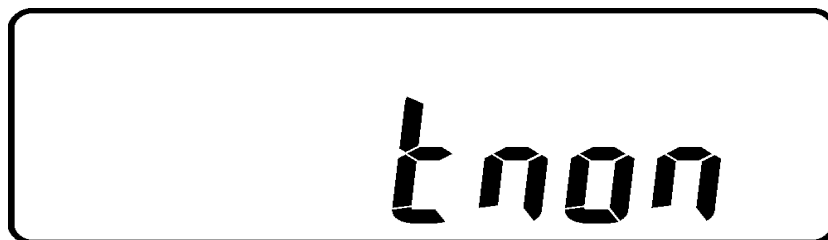
3.5.1.15

* Display shows alarm (b for buzzer) "Off".

3.5.1.16

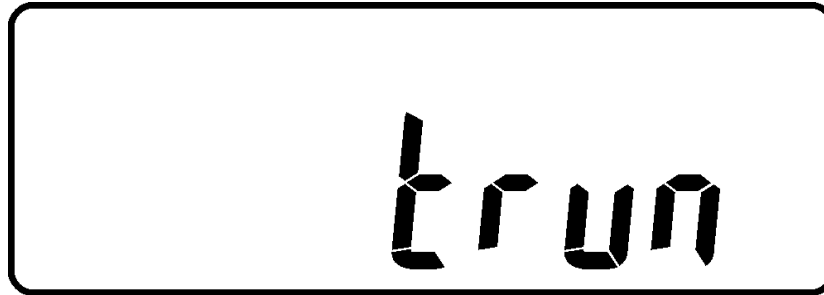
3.5.1.17 Press  key pad to scroll through the screens to check the UPS settings. The LCD display will change, in sequence, from Drawing Q1(alarm/buzzer) → Drawing R1(Self-test) →Drawing S1(Bypass Voltage Windows) → Drawing T(Output Frequency Synchronization Window) →Drawing U(Inverter Output Voltage) →Drawing V1(UPS Operation Mode) →Drawing W(Output Voltage Micro Tune Value) →Drawing X(UPS Id) →Drawing Y(Parallel function status).

R1



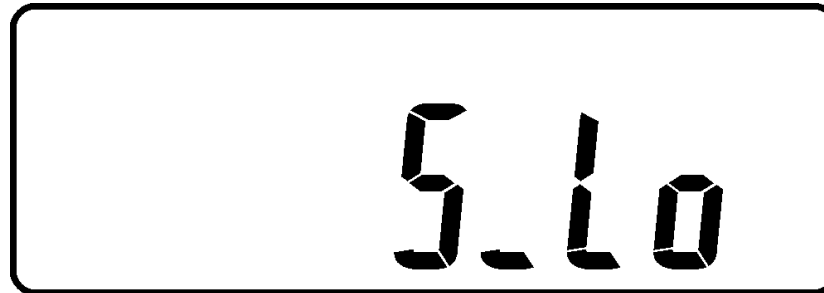
* Display shows self-test is NOT "on".

R2



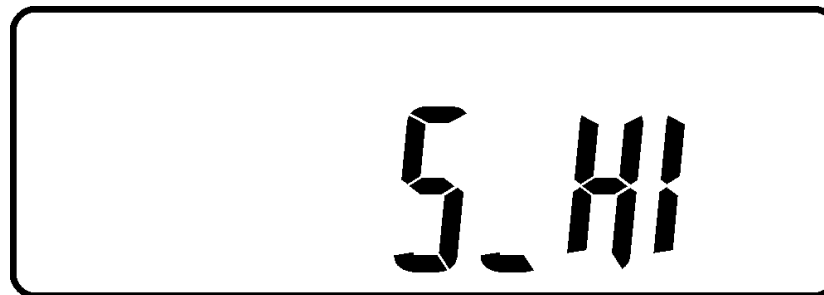
* Display shows self-test is "On".

S1



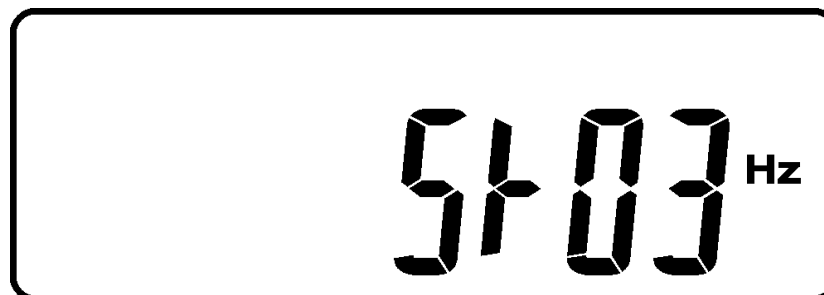
* Display shows Bypass Voltage is adjusted to narrow one.

S2



* Display shows bypass voltage is adjusted to wider one.

T



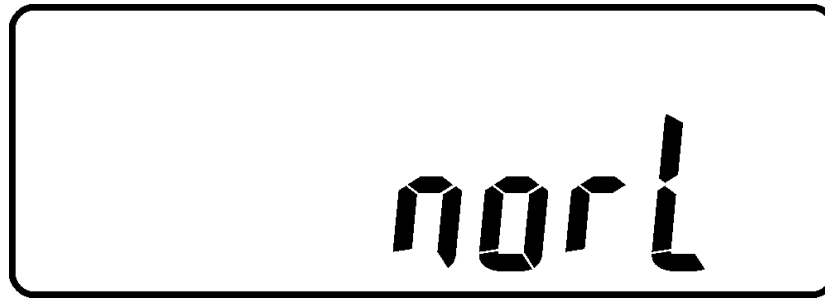
* Display shows Frequency Window is +/-3Hz.

U



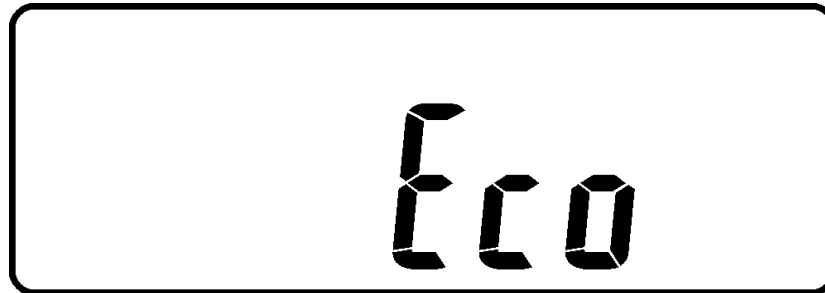
* Display shows inverter output voltage.

V1



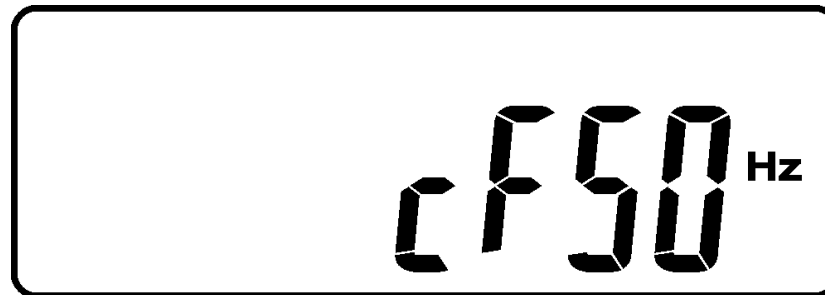
* Display shows the UPS is operated in "normal mode".

V2



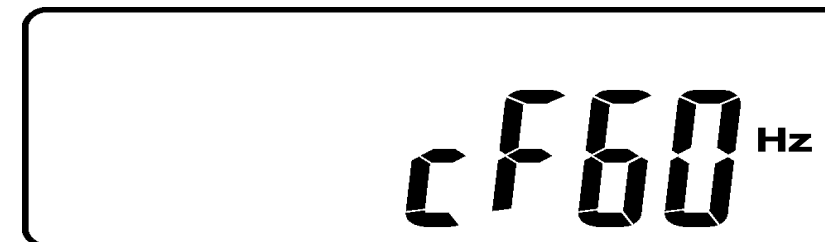
* Display shows the UPS is operated in "Eco mode".

V3



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

V4



* Display shows the UPS is operated in "CVCF 60Hz mode"

W



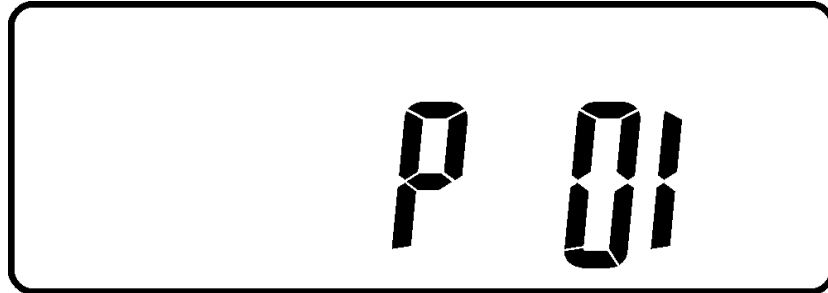
* Display shows Output Voltage Adjustment % from 0% to 3% or -0% to -3%.

X




* Display shows UPS Identification Number.






Y



* Display shows the UPS is in position No. 1 in a parallel system.

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

UPS Default Settings and their alternatives

- 3.5.1.19 Make sure the UPS is OFF. Press On Switch  and scroll down  key pads simultaneously for approx. 3 seconds, the alarm will sound twice, the LCD display screen shows as drawing Q1. The UPS is now in settings mode.
- 3.5.1.20 To scroll down the LCD screen, you may refer to Chapter 3.5.1.15
- 3.5.1.21 With the exception of the alarm/buzzer(as drawing Q1 & Q2) and Self-test(as drawings R1 & R2), all of the other default settings may be changed by pressing the scroll up  key pad.
- 3.5.1.22 Drawings S1 and S2 show the acceptable range for bypass input. It can be 184Vac~260Vac (S2) or 195Vac~260Vac (S1).
- 3.5.1.23 Drawing T shows the bypass frequency window of the Inverter Output. The acceptable setting values are $\pm 3\text{Hz}$ and $\pm 1\text{Hz}$.
- 3.5.1.24 Drawing U shows the acceptable Inverter Output Voltages as 200Vac, 208Vac, 220Vac, 230Vac, or 240Vac.
- 3.5.1.25 Drawing V1, V2, V3 and V4 show the operating modes of the UPS, of the UPS. Alternatives are Online, Eco(Economic) mode, fixed 50Hz Output or fixed 60Hz Output.
- 3.5.1.26 Drawing W shows the setting of the Inverter Output, which can be calibrated as 0%, +1%, -1%, +2%, -2%, +3%, or -3%.
- 3.5.1.27 Drawing X shows a specified address and position of the UPS when the UPS is in Parallel mode. The settable position numbers are from 1st to 4th. The number must be 1st if the UPS is not in parallel.
- 3.5.1.28 When all of the setting changes are complete, you have to press the enter  key 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 the settings, press the "OFF"  key for 5 seconds, then the LCD screen turns to Drawing AA directly, which means your setting changes are ignored.

Z



* Press Enter key to save data.

AA







* Display shows the UPS is locked.

3.5.1.29 Turn Off the Utility power to the UPS Input.

3.5.1.30 Your Setting changes are complete.

UPS Is Off Due to Unknown Reason and Its Trouble Shooting

3.5.1.31 If a serious abnormal condition has occurred, the UPS will lock it itself in the “OFF” position as shown in drawing AA, and a abnormal message will show on the LCD screen.


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

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

3.5.1.33.1 Check those error messages recorded.

3.5.1.33.2 Refer to Chapter 2.2 to trouble shoot the problem of the UPS.


Otherwise, consult your local distributor for service.

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

3.5.1.33.4 Turn Off the Utility Input.

3.5.1.33.5 The UPS lock has been, but you will still need to contact your Local distributor to make sure the error message shown is solved.



Shut Off

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

3.5.1.35 Turn Off the Utility and Bypass Input.

3.5.1.36 The UPS is turned off completely.

Maintenance Bypass Mode

- 3.5.1.37 Maintenance Bypass Mode is intended for UPS maintenance only. The following procedure must be performed by an authorized, trained service technician. If there is any damage caused by failure to follow this procedure or unauthorized use of the Maintenance Bypass Mode, your warranty will be void.
- 3.5.1.38 Press the Off  key pad for approx. 5 seconds, the LCD screen shows as drawing B and the UPS output is in bypass mode.
- 3.5.1.39 Release the cover of the CAM Switch (Maintenance Bypass Switch) first, then turn on the CAM Switch to “Bypass” mode, then verify that the right-hand upper Corner of the LCD screen will show  sign.
- 3.5.1.40 Turn off the Utility and Bypass inputs to the UPS. You can now proceed with UPS maintenance now.
- 3.5.1.41 To return the UPS to normal operating mode, turn off the Utility and Bypass input to the UPS. Set the CAM switch to “INV” mode, fasten the cover back into position and repeat 3.5.1.5 to 3.5.1.9 The UPS will switch back to inverter mode.
- 3.5.1.42 It is required to go through 3.5.1.38 first, then go through 3.5.1.39. If you skip 3.5.1.39.2, the UPS will alert for 10 seconds to warn that the procedure is abnormal, which may damage the UPS due to uncertain utility status. The UPS will switch back to Inverter mode immediately if you turn the CAM switch back to “INV”.




4 Troubleshooting Guide

4.1. Trouble Shooting

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

- a. Is the input and output power wiring correct?
- b. If the Utility voltage within the input window of the UPS?

In case problems or symptoms still exist, refer to the following tables. Should the problem persist, contact your local distributor for help.

Situation	Check Items	Solution
UPS Red Fault LED lights up	Check the error code shown on the LCD screen 1. Er05,  &  2. Er06, Er10, Er12, Er28 &  3. EPO 4. Er11 5. Er15 6. Er24 7. other error code	<ol style="list-style-type: none"> 1. 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. 2. Remove some uncritical load at the UPS output end. If any damage of the coating of AC power cord, please replace a new one. 3. Remove the short circuit occurred at the EPO terminal. 4. Remove the objects blocked onto the ventilation holes. 5. Make sure the UPS is operated normally. If it is on CVCF mode, you have to turn off and turn on the UPS again. 6. 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. 7. Consult your local distributor for help.
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 0 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.

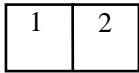
5.2. Software Installation

Please refer to the user's manual of the software for installation. The manual is located on the CD contained in the package.

6 Customer Options Slots

6.1. All the below interface cards are with built-in EPO function.

The pin assignments of the EPO are:

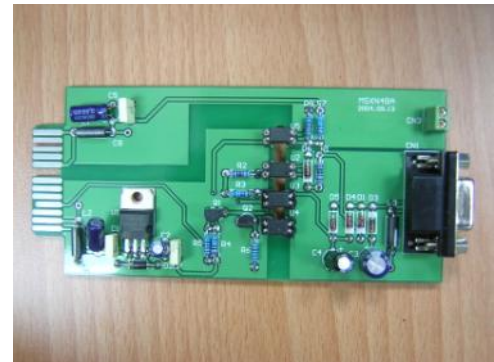


1 → EPO+
2 → Ground

To enable the EPO function, please short Pin 1 & 2.

6.2. R2E (2nd RS-232) card

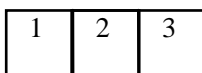
CN1 is for RS232 DB9 and CN3 is for EPO.
For communication protocol, please refer to Chapter 0
Installation Position: slot1(CHA-CN4) or slot 2(CHB-CN5).
Adapted flat cable: cable A or cable B
For installation, please refer to Chapter 6.7



6.3. RSE (RS-485) card

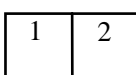
CN1 allows the terminal resistor to function.
Short pin1-2 to enable the function and short pin 2-3 to disable it.
CN2 for RS485 and CN3 for remote power.
Definition
For communication protocol, please see the definition below:

CN2



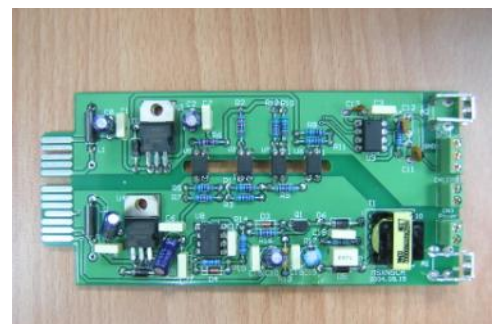
1 → Ground
2 → A/Data+
3 → B/Data-

CN3



1 → AC+
2 → AC-

Installation Position: slot 1 or slot 2.



6.4. USE (USB) card

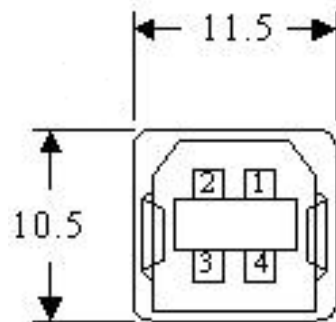
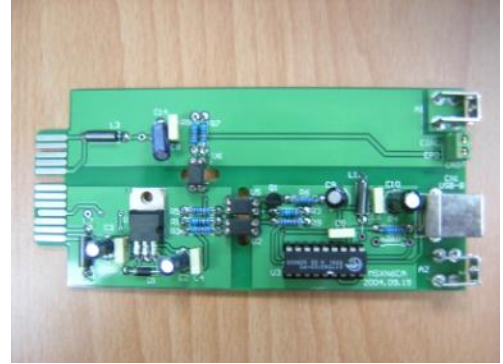
CN1 for USB and CN3 for EPO.

For communication protocol, please see the definition below:

Comply with USB version 1.0,1.5Mbps

Comply with USB HID Version 1.0.

The Pin Assignments of the USE card:



1 → VCC (+5V)

2 → D -

3 → D +

4 → Ground

Installation Position: slot1 or slot 2.

Adapted flat cable: cable A or cable B

For installation, please refer to Chapter 6.7

6.5. DCE (Dry Contact) card

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

Pin 3: Inverter On

Pin 4: Battery Low

Pin 5: Battery Bad or Abnormal

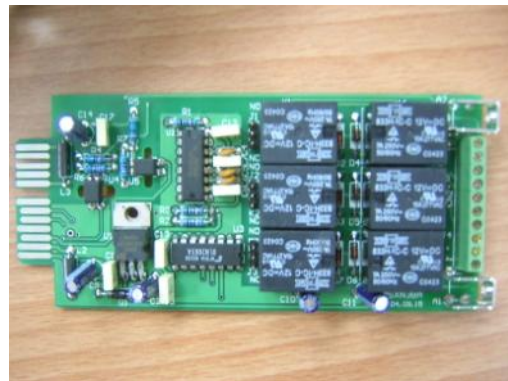
Pin 6: UPS Alarm

Pin 7: Common

Pin 8: Shutdown UPS positive(+) signal

Pin 9: EPO+

Pin 10: Ground



The shutdown function will be activated, after a +6~+25Vdc is connected between pin 9 and pin10 for 5 seconds.

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

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

Flexible signal output for N.C.(Normally closed) or N.O.(Normally open) contact by shorting pin1-2 or pin 2-3 from JP1-5.

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 pin 9-10 of CN3 if pin 2-3 of both CN1and CN6 are shorted by cap.

6.6. SNMP Cards

SNMP/WEB card

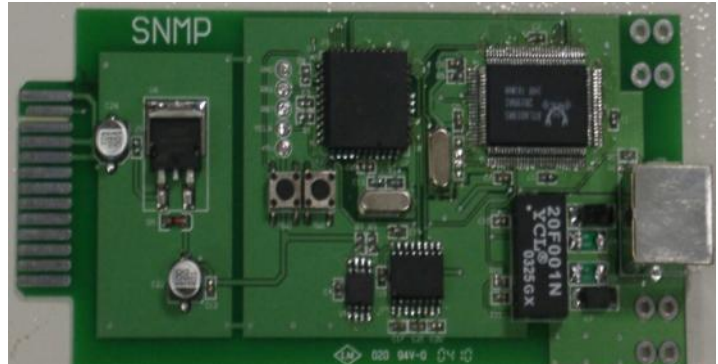
For installation, please refer to the user's manual attached with the card. .

Installation

Position: slot1 or slot 2.

Adapted flat cable: cable A or cable B

For installation, please refer to Chapter 6.7



Net Agent II Internal Card

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

Installation

Position: slot 2.

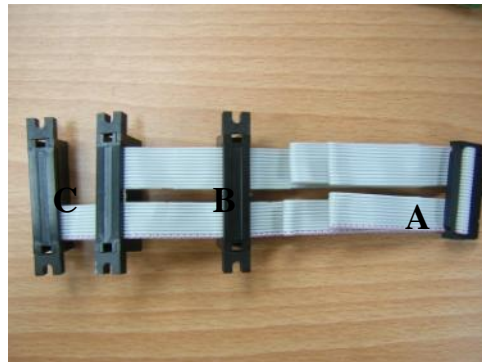
Adapted flat cable: cable C.

For installation, please refer to Chapter 6.7



6.7. The Installation of those Interface Cards

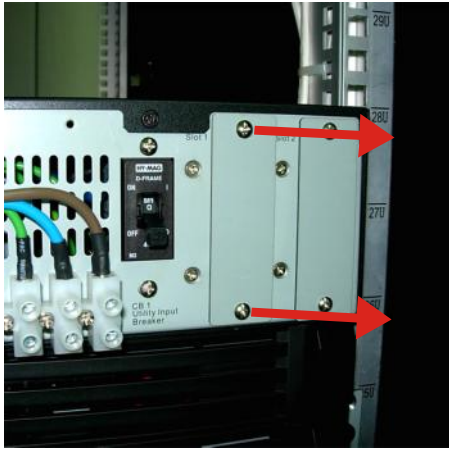
Make sure that the flat cable installed is the same as the one indicated below.



Please proceed the hardware installation as indicated below.

1. Remove the cover of Slot 1.
2. Slide in the selected interface card onto the Slot.
3. Fasten properly the selected interface card.

1



2



3



7 Hot Swappable Battery Replacement

1. Unscrew the flank of the battery bank front panel as indicated in Step 1.



2. Remove the front panel as indicated in Step 2.



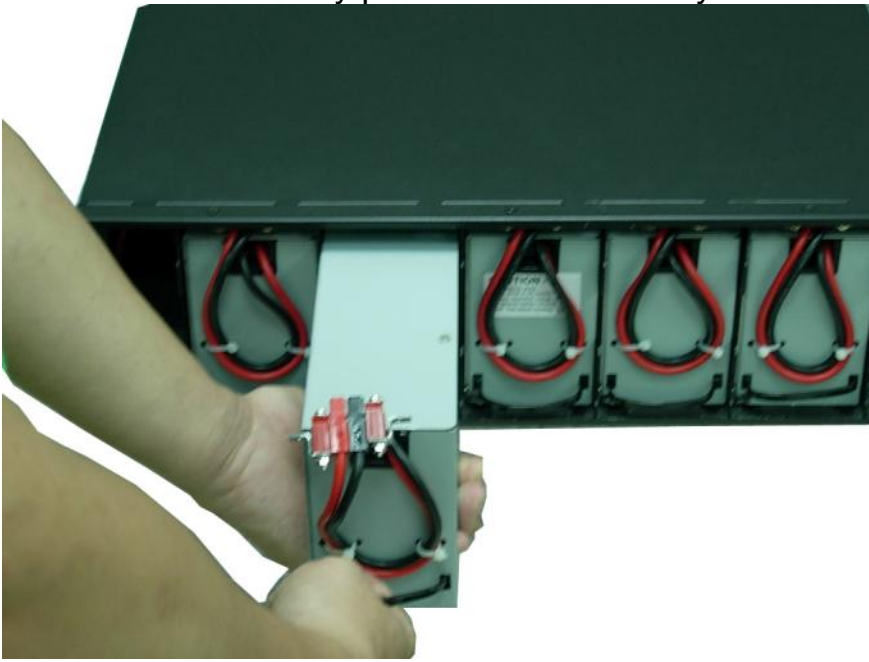
3. Remove the screw of the battery pack as shown in Step 3.



4. Unplug the hot swappable battery connectors as shown in Step 4.



5. Remove the battery packs from the battery bank as shown in Step 5.



8 Specifications

*Model – UPS Module 1	SC60021RM	SC60022RM
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INPUT

Voltage Range	160 -280Vac
Frequency	45 ~ 65 Hz
Phase/Wire	Single, Line + Neutral + Ground
Power Factor	Up to 0.99 at 100% Linear Load
Current THD	<5% at 100% Linear Load

OUTPUT

Connection	Hardwire	Hardwire
Voltage	208/120Vac or 240/120Vac	208/220/230/240Vac Selectable, 280/120, 240/120
Voltage Adjustment	+/- 0%; +/- 1%; +/- 2%; +/- 3%	
Voltage Regulation	+/- 2%	
Capacity	6000VA/4200W	
Rated Power Factor	0.7 Lagging	
Wave Form	Sine Wave, THD < 3% (no load to full load)	
Frequency Stability	+/- 0.2% (Free Running)	
Frequency Regulation	+/- 1%	
Transfer Time	0ms	
Crest Factor	3:1	
Efficiency (AC to AC Nominal)	91%	
Efficiency (AC to AC ECO Mode)	Up to 97%	
Leakage Current	< 3mA @ Full Load	
DC Start	Yes	
Cooling	Variable Speed Fans (load determines speed)	

DISPLAY, ALARMS, DIAGNOSTICS & COMMUNICATIONS

Status On LED + LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnected, Overload, Transferring with interruption & UPS Fault
Readings On LED + LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Units Inner Temperature
Self-Diagnostics	Upon Power –on, Front Panel Setting & Software Control, 24 Hour self check
Audible Alarms and Visual	Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions
Communications	RS232 Serial Port (2 slots available for optional SNMP/WEB, USB or Dry Contact Card)

PHYSICAL

Input Connection	Hardwire and Cord with L6-30P Plug (Selectable)
Output Connection	Hardwire
Dimensions (H x W x D) inches	3.5 x 17.3 x 26 (2U)
Weight (lbs.)	53
Listing	UL1778; CE – FCC Class A

EXTERNAL BATTERY PACK – Module 2

*Model	SC-BP6000RM-1 (same battery used for extended run times)
Battery Run Time @ Full Load	8 minutes
Type	Sealed Lead Acid Maintenance Free, 20 each 12V/7AH, 240Vdc
Hot – Swap Batteries	Yes
Recharge Time	4 hours to 90%
Battery Connection	Plug Connector
Extended Run Time Battery Packs	Yes
Dimensions (H x W x D)	5.25" x 17.3" x 26" (3U)
Weight (lbs.)	119

***OUTPUT TRANSFORMER / MANUAL BYPASS - Module 3 (Hardwired to UPS Module)**

Output Voltage	208/120Vac or 240/120Vac	208/120Vac or 240/120Vac
Manual Bypass Switch	Make-Before-Break	
Dimensions (H x W x D)	3.5" x 17.3" x 26.0" (2U)	
Weight (lbs.)	93	

POWER DISTRIBUTION UNIT (PDU) –Module 4 Optional (Hardwired to Transformer Module)

MODEL	SC6RMPDU1	SC6RMPDU2
Input Voltage of UPS Module	208 or 240Vac	208 or 240Vac
Output Voltage through Receptacles	208/120Vac or 240/120Vac	208Vac or 240Vac
Output Receptacles	(1) L6-30R, (1) L5-30R, (1) L5-20R, & (2) 5-15/2020R	(1) L6-30R, (1) L6-20R & (4) 6-20R
Dimensions (H x W x D)	3.5" x 12.8" x 2.8" (2U)	
Weight (lbs.)	7	

COMMUNICATIONS AND SHUTDOWN SOFTWARE (Optional)

SCNET-INT	SNMP/WEB Network Card with Shutdown Software
SCContact/EPO	Dry Contact & EPO Card

Note: (2) slots available; both cards can be used simultaneously; RS232 Port is disabled when communication cards are installed.

EXTENDED BATTERY PACK CHARGER (Optional)

SCCHG1000	1000W External Mount Battery Charger (1) charger per every (2) External Battery Packs Required	6.6"W x 11.1"D x 3.4"H	7 lbs.
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****PARALLEL FOR CAPACITY/REDUNDANCY (4 Units maximum)**

SG-PKIT-2	Parallel Distribution Bypass 60Amp for (2) UPS Modules	10.5"W x 9.5"D x 3.7"H	11 lbs.
SG-PKIT-4	Parallel Distribution Bypass 120Amp for (4) UPS Modules	10.5"W x 16.4"D x 3.7"H	20 lbs.

* Modules 1, 2 & 3 make up a complete hardwired 208/120Vac or 240/120Vac output system.

** Parallel for capacity configurations can use (1) battery system sized for the ultimate capacity.

**Parallel for redundancy configurations require (1) battery system for each UPS.

LIMITED WARRANTY FOR UniStar P UNINTERRUPTIBLE POWER SUPPLY – DEPOT REPAIR OR REPLACE. This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser’s business: USA & Canada.

General:

Staco Energy Products Co. (“Staco”) products and systems are in our opinion the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances we offer with our products the following Warranty against Defects in Material and Workmanship. Warranty period is three (3) years from date of installation (max 42 months from ship date) for UniStar P, and two (2) year from date of installation (max 30 months from ship date) for UniStar P .

Please read your Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

Terms of Warranty:

As provided herein, the Staco product is warranted to be free of defects in material and workmanship for a period defined above. If any part or portion of the Staco product fails to conform to the warranty within the warranty period, Staco, at its option, will furnish new or factory remanufactured part(s) for repair or replacement of that portion or part.

Warranty Extends to First Purchaser for Use, Non-transferable:

This Warranty is extended to the first person, firm, association or corporation for whom the Staco product specified herein is originally installed for use in the United States (the “User”). This Warranty is not transferable or assignable without the prior written permission of Staco.

Warranty Claims Procedure:

Within a reasonable time, but in no case to exceed sixty (60) days, after User’s discovery of a defect, User shall contact Staco Field Services at 1-866-261-1191. Subject to the limitations specified herein, nonconforming may be returned to Staco for repair or replacement, at Staco’s discretion, without charge for material or labor. All returns must be shipped freight prepaid to Staco Energy products Co. Staco will pay freight charges from factory to customer domestic (US and Canada) location. In the event that the nonconforming unit is not returned, User may be billed for new unit replacement cost.

Items Not Covered By Warranty:

THIS WARRANTY DOES NOT COVER DAMAGE OR DEFECT CAUSED BY misuse, improper application, wrong or inadequate electrical current or connection, inadequate water or drain services, negligence, repair by non-Staco designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, acts of nature, theft or installation contrary to Staco’s recommendations, or in any event if the Staco serial number label or tag has been altered, defaced, or removed.

THIS WARRANTY DOES NOT COVER return shipping costs, installation costs, circuit breaker resetting or maintenance or service items and further, except as may be provided herein, does NOT include labor costs or transportation charges arising from the replacement of the Staco product or any part thereof or charges to remove the same from premises of User.

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT OR PART THEREOF DOES NOT EXTEND THE ORIGINAL WARRANTY PERIOD.

Limitations:

- THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- USER'S SOLE AND EXCLUSIVE REMEDY IS REPAIR OR REPLACEMENT OF THE STACO PRODUCT AS SET FORTH HEREIN.
- IF USER'S REMEDY IS DEEMED TO FAIL OF ITS ESSENTIAL PURPOSE BY A COURT OF COMPETENT JURISDICTION, STACO'S RESPONSIBILITY FOR PROPERTY LOSS OR DAMAGE SHALL NOT EXCEED ONE TIMES THE NET PRODUCT PURCHASE PRICE.
- IN NO EVENT SHALL STACO ASSUME ANY LIABILITY FOR INDIRECT, SPECIAL, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER, INCLUDING WITHOUT LIMITATION LOST PROFITS, BUSINESS INTERRUPTION OR LOSS OF DATA, WHETHER ANY CLAIM IS BASED UPON THEORIES OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT, OR OTHERWISE.

Miscellaneous:

- NO SALESPERSON, EMPLOYEE OR AGENT OF STACO IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY.
- Staco obligations under this warranty are conditioned upon system start-up by an authorized Staco service engineer and timely receipt of full payment and supersede all previous warranties. Staco reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to User or others.
- In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the warranty period, the remaining terms and provisions shall continue in full force and effect.
- This Warranty is given in and performance hereunder is to be construed under the laws of the State of Ohio.
- This Warranty represents the entire agreement between Staco and User with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings or agreements relating to this subject.

International:

Staco Energy Products Co. (Staco), Dayton, Ohio, warrants this equipment, with all applicable terms and conditions stated above, to be free of defects in material and workmanship for a period of one year from the installation date, no more than eighteen (18) months from shipment date from a Staco warehouse. For equipment physically located outside the USA or Canada this warranty covers defective parts only.

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