Parallel Kit Installation Guide

V. 1.0

1. Package Inside

In parallel kit, you will find the following items in the package:

- Two Parallel boards
- Parallel cable
- OP relay board
- Share current cable
- 2-pin white cable、4-pin white cable and 14-pin grey cable
- A short blue wire and a short brown wire
- Three Kinds of screws for assembly

Note: The 6K(L) and 10K(L) have the same specs of relay board, wire, and cable .

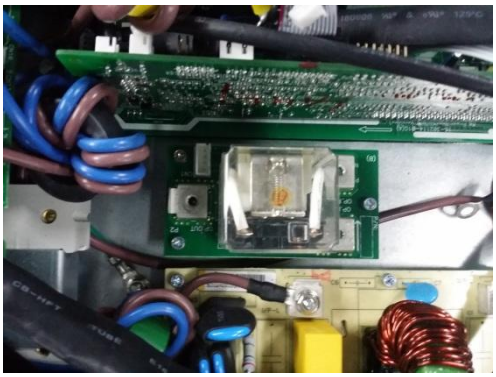
2. Product Introduction

By installing parallel kit into standard models, the standard online UPS can be operated as parallel system. This kit simplifies the process of upgrading standard model to parallel model and provides high flexibility to customers.

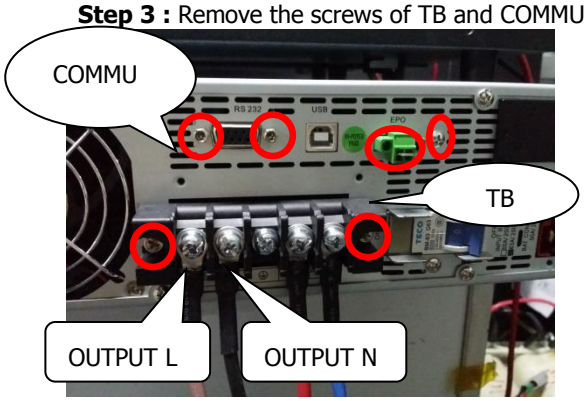
3. Installation

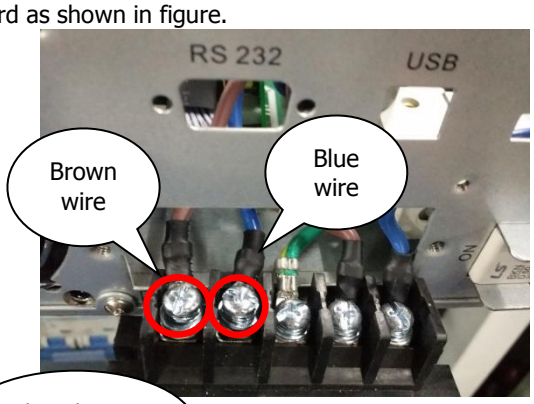
Step 1: Remove U cover by unscrewing all screws.

Step 2: Screw OP relay board on the frame next to the main board and EMI board.



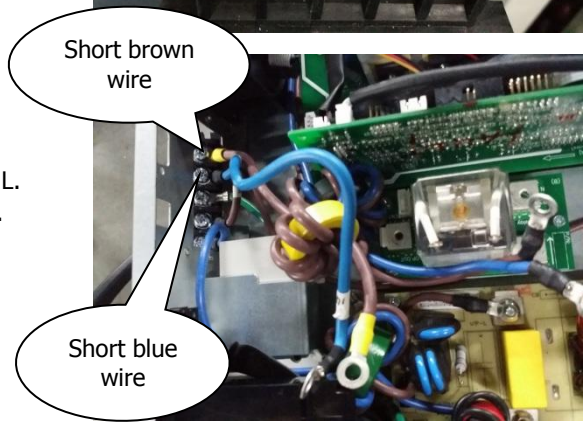
Step 3 : Remove the screws of TB and COMMU board as shown in figure.



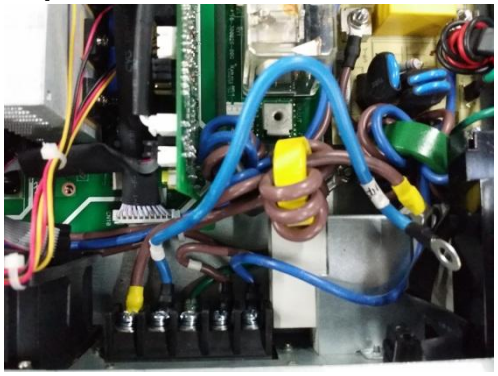


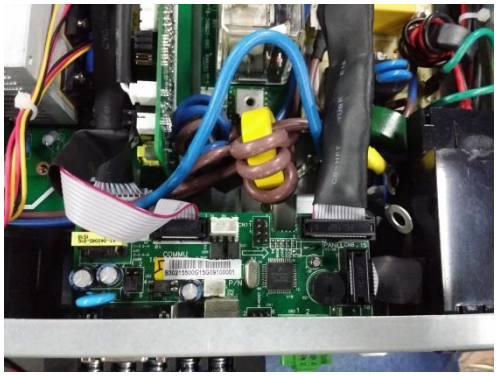
Step 4:

① Remove the brown wire on OUTPUT L.
② Remove the blue wire on OUTPUT N.
③ Screw the short brown wire on OUTPUT L.
④ Screw the short blue wire on OUTPUT N.



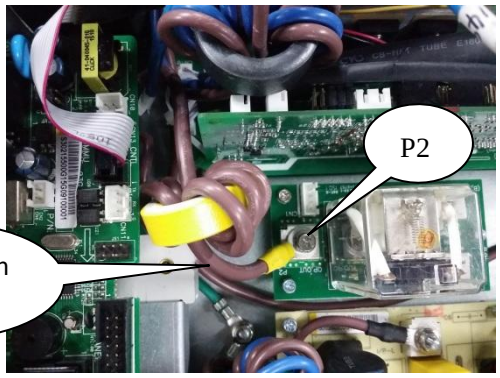
Step 5: Then return TP and COMMU board back as step 3.



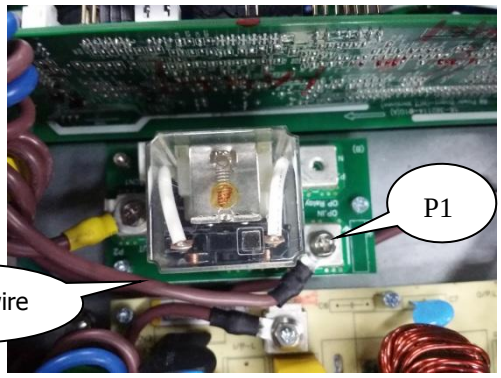


Step 6:

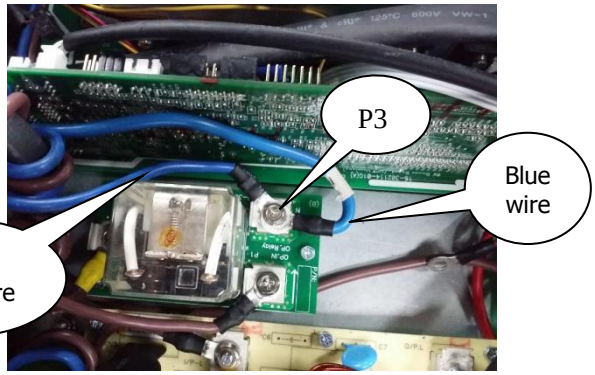
① Screw the short brown wire on P2.



② Screw the brown wire on P1.



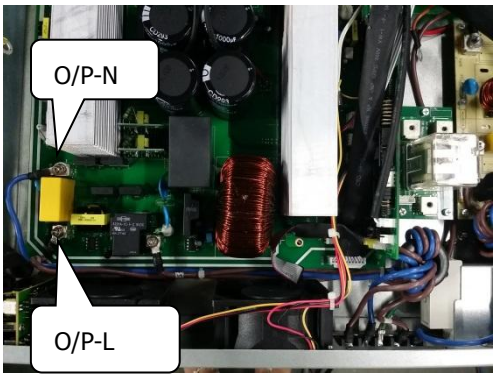
③ Screw the short blue wire and the blue wire on P3.



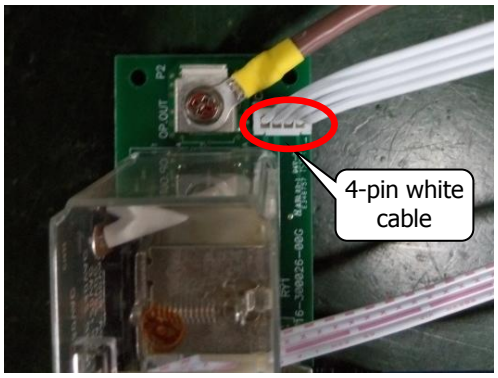
Notes:
The wire that connect O/P-L point of PSDR board to P1 point of OP relay board is a brown wire which from original machine.

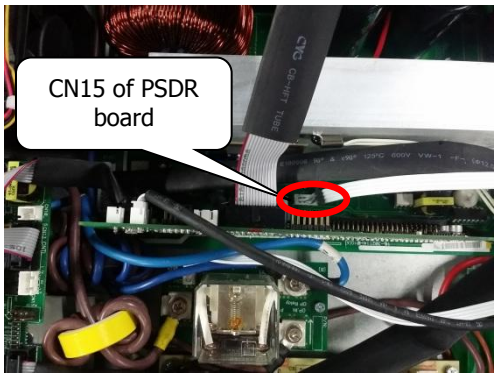
Now the No.3 position should has two blue wires. One is connect to O/P-N of PSDR board. The other is the short blue wire connect P3 point of OP relay board to the TP's OUTPUT N. The short blue wire is supplied in the package.

The short brown wire connect P2 point of OP relay board to the TP's OUTPUT L is supplied in the package.

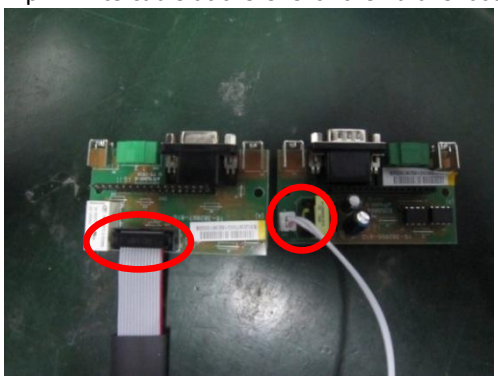


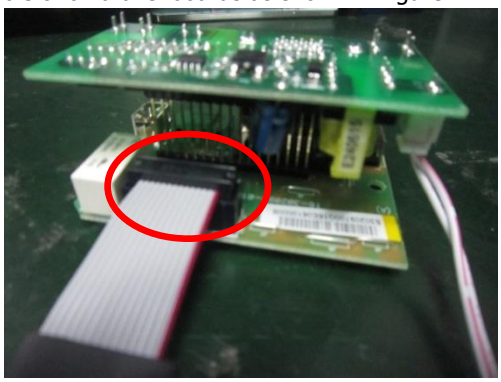
Step 7: Connect CN1 of OP relay board to CN15 of PSDR board with a 4-pin white cable.



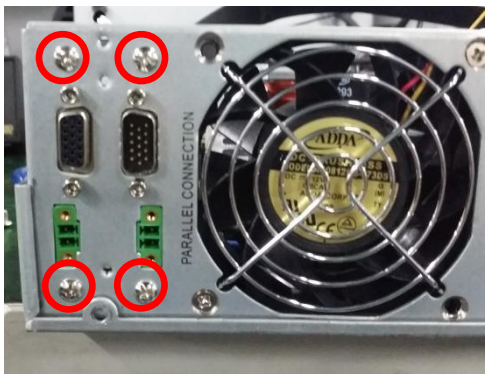


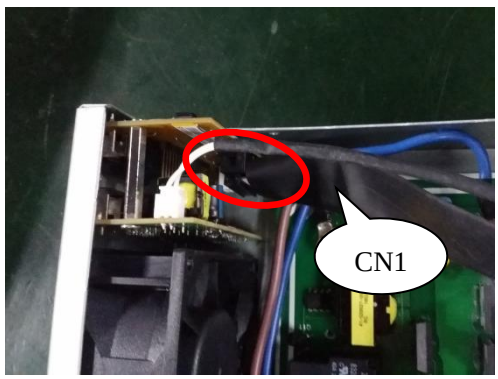
Step 8: Insert one end of the 14-pin grey cable at the CN1 of the Parallel board. Insert one end of the 2-pin white cable at the CN9 of the Parallel board. Assemble two Parallel boards as shown in figure.



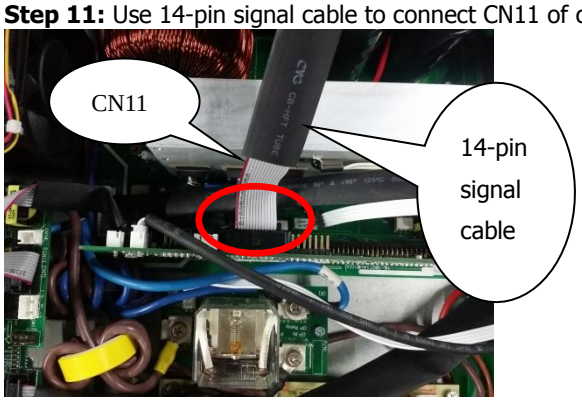


Step 9: Install and screw parallel board tightly like that. Four screws are needed.





Step 11: Use 14-pin signal cable to connect CN11 of control board and CN1 point of parallel board.



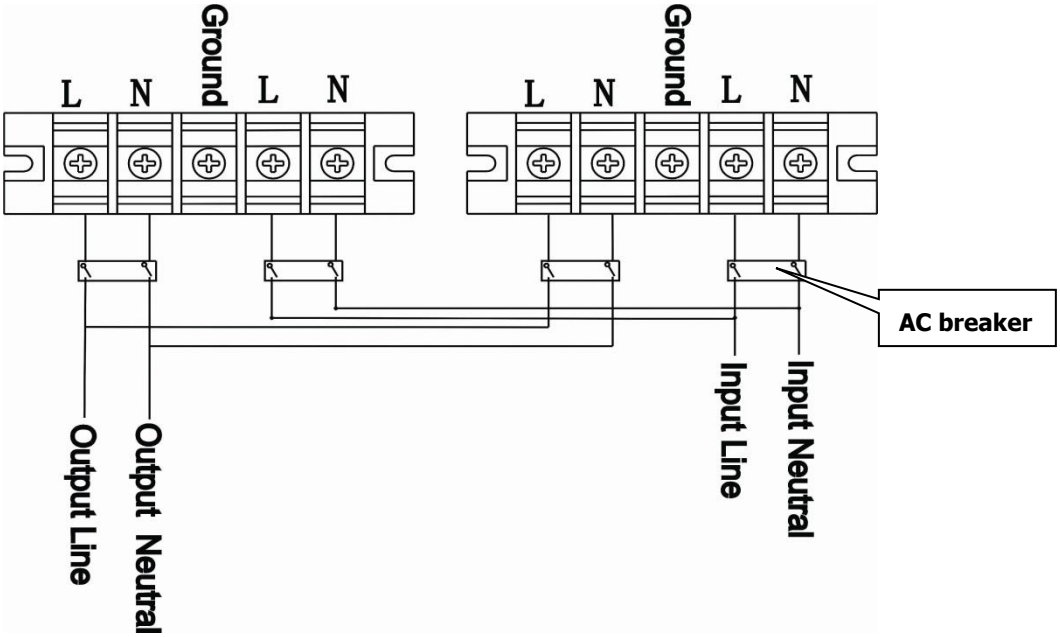
Step 12: Use 2-pin power cable to connect CN17 or CN16 of sps board and CN9(refer to step 8) of parallel board.

4. Wiring Connection for Parallel Operation

Please follow below steps to connect cables for 6K(L)/10K(L) parallel models. It will provide high flexibility for future maintenance and upgrades.

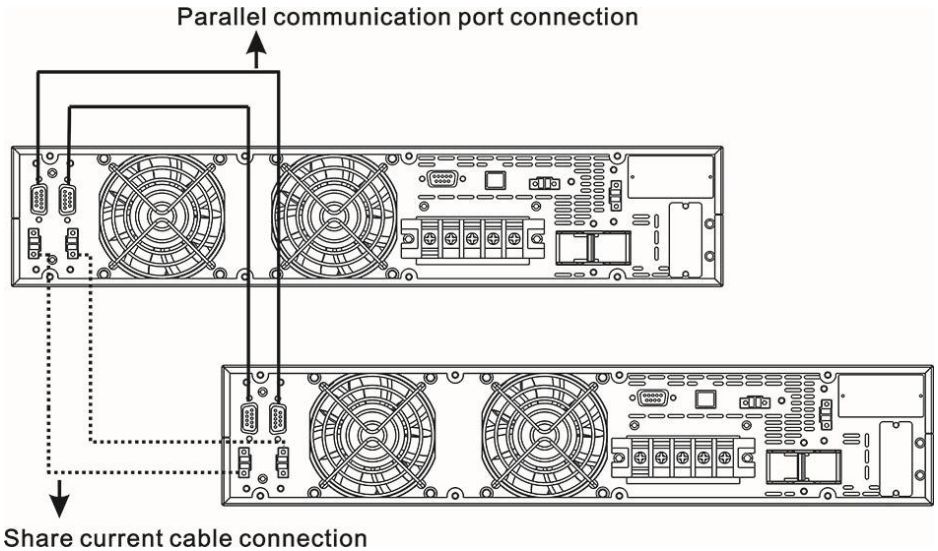
Requirements: Two parallel cables and two share current cables.

Step 1: Connect the input/output wires of each UPS to an input/output breaker.



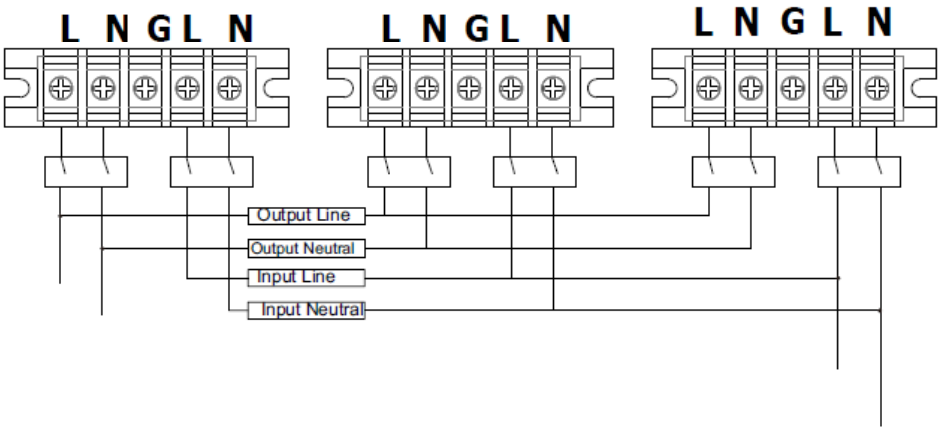
Step 2: Connect all input/output breakers to a major input/output breaker. Then this major input/output breaker will directly connect to the AC source/loads.

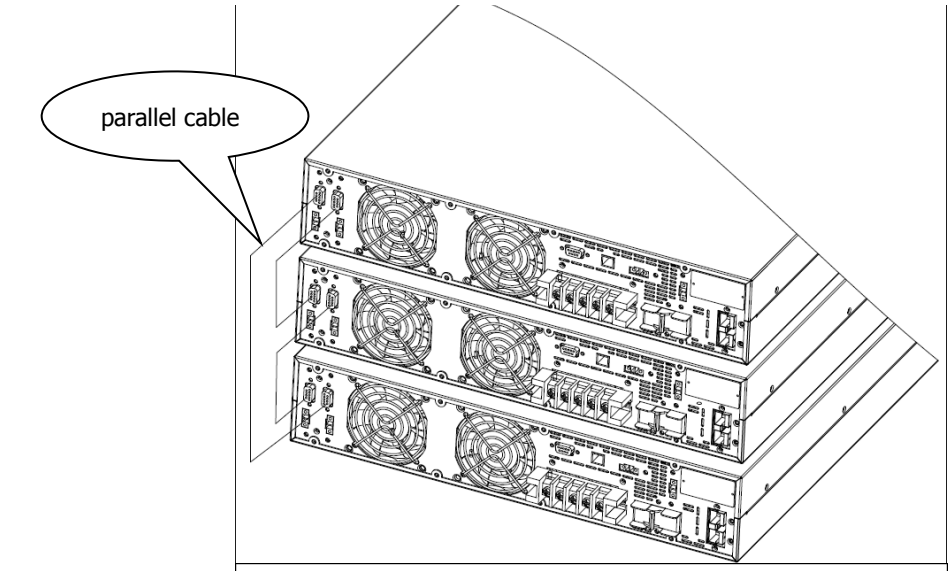
Step 3: Connect each UPS one by one with the parallel cable and share current cable. It's all dummy-proof design which can prevent customers from mis-connection. However, any stress to cables will cause bad contact or broken inner wires. Please be aware of that.

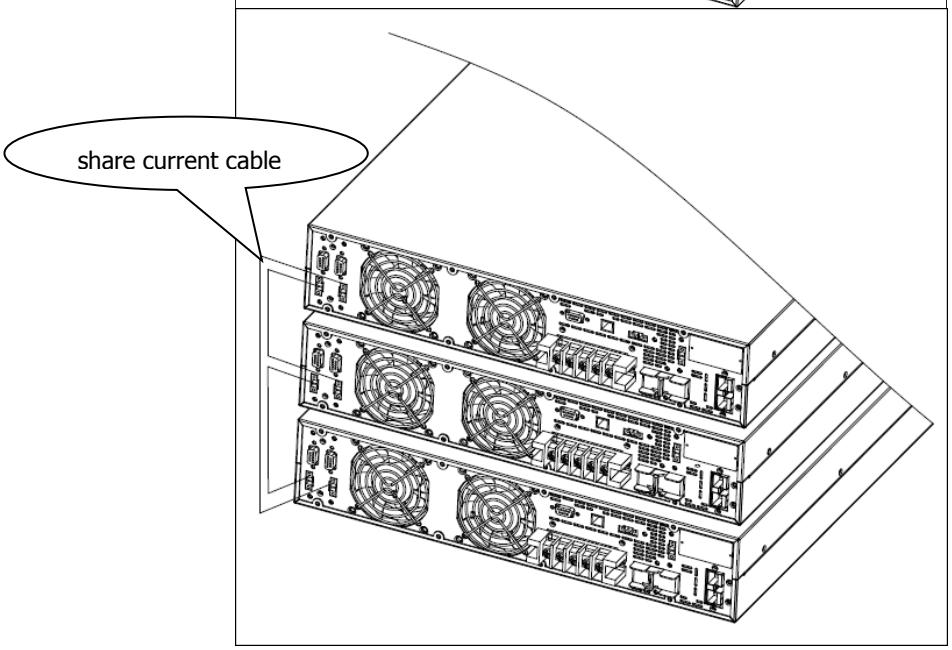


Notes: The parallel system can not use one battery pack. Otherwise, it will cause system permanent failure. Each UPS should be connected to an independent battery pack . If the UPS is connected to external battery pack, it's required to install battery breaker (DC type) in each UPS. Besides, we strongly suggest to installs a breaker (AC type, D curve) for input/output in each unit. Please refer to UPS user manual for the selection of diameter and color of the wires.

Appendix 1: Wiring connection for three UPSs running in parallel operation







5.Parallel Operation

1) Make sure that the parallel board and OP relay board have been installed correctly.
2) Make sure that each UPS has the same configuration, including the following parameters:
   a) output voltage,
   b) output frequency,
   c) bypass voltage range,
   d) bypass frequency range,
   e) converter enable or disable,
   f) bypass enable or disable,
   g) bypass open or forbidden,
   h) frequency auto detect enable or disable,
   i) inverter short clear enable or disable
3) Turn on the UPS into the line mode or battery mode respectively, and measure the output voltage by multimeter. Make sure the difference of the output voltage among the UPSs is less than 1.5V(typical 1V). If not, you can adjust the voltage via LCD as bellow:

Interface	Setting
	**Parameter 2:** you may choose **Add** or **Sub** to adjust inverter voltage **Parameter 3:** the voltage range is from 0V to 6.4V, the default value is 0V.

If voltage difference remains more than 1V after calibration, please contact your local distributor or service center for help. After adjusting the inverter voltage, check the output voltage detecting if ok. Entering the picture as below via LCD, the LCD will display the output voltage detected. If the difference between the display value and the voltage measured by mutimeter is more than 1V, adjusting it make sure the difference is no more than 1V. Then shut down the UPS to save this setting into EEPROM.

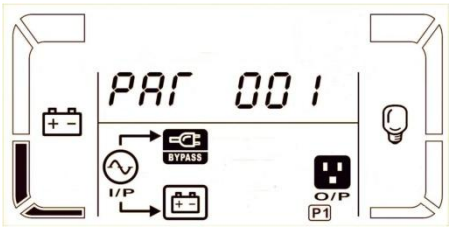
Interface	Setting
	**Parameter 2:** it always shows **OP.V** as output voltage. **Parameter 3:** it shows the internal measurement value of the output voltage, and you can calibrate it by pressing **Up** or **Down** according to the measurement from an external voltage meter. The calibration result will be effective by pressing **Enter**. The calibration range is limited within +/-9V. This function is normally used for parallel operation.

4) Connect the UPSs referring to the Section 4
5) Turn on the parallel system with utility power supply (in AC mode)
   a) Set each UPS's breaker of the battery pack at "ON" position (ony for long-run model).

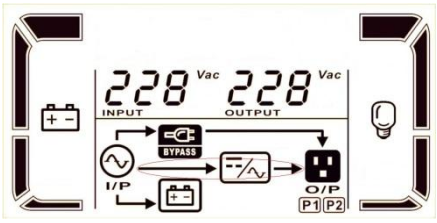
   NOTE: the parallel UPSs can not use one battery pack. Each UPS should have its own battery pack.

   Then set each UPS's input breaker and output breaker at "ON" position. At this time the fan is running and the UPS enter to power on mode for initialization, several seconds later, UPSs operates in Bypass mode. After a while when UPSs' output relays have closed, the parallel system supplies power to the loads via the bypass.
   b) Check the LCD whether displays the parallel information as showed in the below picture. If

parallel UPS systems are successfully set up, it will show "**PAR**" and assigned number as below picture. The master UPS will be default assigned as "**001**" and slave UPSs will be assigned as either "002" or "003". If not see this picture, you can not go to next step and please check if the parallel cables have been connected well.



c) Press and hold the "ON" button for 0.5s to turn on the UPS one by one, the buzzer will beep once and the LCD will display the parallel process as showed in the below picture, the sign in the red circle will twinkle until the UPSs entering to AC mode synchronously, the parallel system start to supply power to the load.



6) Turn on the parallel system without utility power supply (in Battery mode)

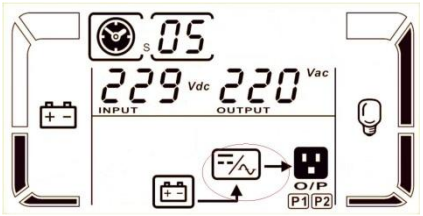
a) Check if the parallel cables connected well please follow the below steps:

I) Turn on the battery breaker of each UPS (only for long-run model).

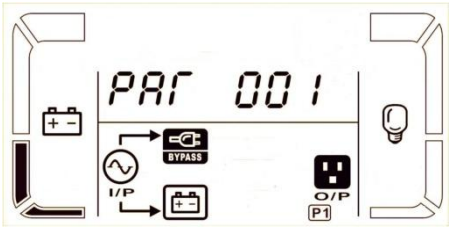
NOTE: The parallel UPSs can not use one battery pack. Each UPS should have its own battery pack

II) Press the "ON" button of one UPS to set up the power supply, UPS will enter to power on mode. After initialization UPS will enter to No Output mode, then Press and hold the "ON" button for 0.5s to turn on the UPS, and the buzzer will beep once. A few seconds later, the UPS will be turned on and enter to Battery mode.

III) Then do the same procedure to the other UPS according II), the LCD will display the parallel process as showed in the below picture, the sign in the red circle will twinkle until the UPSs entering to the battery mode:



IV) Check the LCD whether displays the parallel information as showed in the below picture. If parallel UPS systems are successfully set up, it will show "**PAR**" and assigned number as below picture. The master UPS will be default assigned as "**001**" and slave UPSs will be assigned as either "002" or "003". If not see this picture, you can not go to next step and please check if the parallel cables have been connected well.



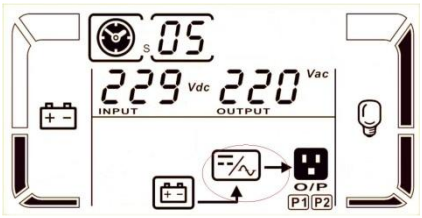
V) Turn off all UPSs in parallel system.

b) Turn on the battery breaker and output breaker of each UPS (only for long-run model).

c) Press the "ON" button of one UPS to set up the power supply, UPS will enter to power on mode. After initialization UPS will enter to No Output mode, then Press and hold the "ON" button for 0.5s to turn on the UPS, and the buzzer will beep once.

d) A few seconds later, the UPS will be turned on and enter to Battery mode.

e) Then do the same procedure to the other UPS according c), the LCD will display the parallel process as showed in the below picture, the sign in the red circle will twinkle until the UPSs entering to the battery mode:



f) Then the parallel system has been installed and starts to supply power to the load.

7) Turn off the parallel system

Press and hold the "OFF" button for 0.5s to turn off the UPS one by one, the buzzer will beep once. After a while, the UPSs will enter to bypass mode or no output mode synchronously.

8) Add one new unit into the parallel system

a) You can not add one new unit into the parallel system when whole system is running. You must cut off the load and shutdown the system.

b) Make sure all of the UPSs are the parallel models, and follow the connection refer to section 4.

c) Install the new parallel system refers to the previous section.

9) Remove one unit from the parallel system

There are two methods to remove one unit from the parallel system:

<u>First method:</u>

a) Press the "OFF" key twice and each time should be lasted for more than 0.5s, then the UPS will enter into bypass mode or no output mode without output.

b) Turn off the output breaker of this unit, and then turn off the input breaker of this unit.

c) After it shutdown, you can turn off the battery breaker (for long-run model) and remove the parallel cable and share current cable. And then remove the unit out of the parallel system.

<u>Second method:</u>

a) If the bypass is abnormal, you can not remove the UPS without interruption. You must cut off the load and shut down the system.

b) Make sure the bypass setting is enabled in each UPS and then turn off the running system. All UPS will transfer to bypass mode.

c) Remove all the maintenance bypass covers and set the maintenance switches from "UPS" to "BPS".

d) Turn off all the input breakers and battery breakers in parallel system.

e) Turn off the output breaker and move the parallel cable and share current cable of the UPS

which you want, then remove it out of the parallel system.

f) Turn on the input breaker of the remaining UPS and the system will transfer to Bypass mode. Set the maintenance switches from "BPS" to "UPS and put the maintenance bypass covers back.

g) Turn on the remaining UPS according to 5).

Warning: (Only for the parallel system)

- Before turning on the parallel system to activate inverter, make sure that all unit's maintenance switch at the same position.
- When parallel system is turned on to work through inverter, please do not operate the maintenance switch of any unit.