by Schneider Electric

User Manual Easy UPS Parallel Kit SRVPK001

Important Safety Instructions

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this document or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to either a “Danger” or “Warning” product safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Product Handling Guidelines













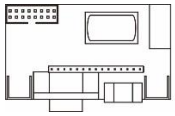
Product Description

The Parallel kit is only compatible with selected 6000VA and 10000VA Easy UPS Online Extended Runtime Model. By installing SRVPK001, Easy UPS Online can be operated as parallel system.

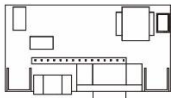
Package Contents

Recycle the packaging materials, or save it for re-use, or dispose it off properly.

For Tower Type UPS



(1)
Master board



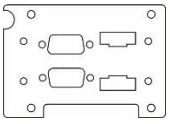
(1)
Slave board



(1)
Parallel cable



(1)
Share current cable



(1)
Parallel board cover



(1)
14-pin black cable
(140 mm)



(1)
2-pin black cable
(370 mm)



(8)
Short screws

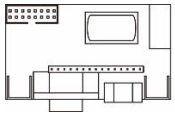


(4)
Hexagonal stud

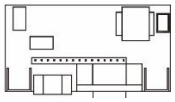


(1)
Magnetic ring

For Rack Type UPS



(1)
Master board



(1)
Slave board



(1)
Parallel cable



(1)
Share current cable



(1)
Magnetic ring



(1)
14-pin black cable
(410 mm)



(1)
2-pin black cable
(650 mm)



(4)
Short screws



(4)
Hexagonal stud

Specifications

Packaging

Model		SRVPK001
Physical	**Dimensions for parallel card Width x Height x Depth**	78.5 x 50 x 33.2 mm (3.09 x 1.97 x 1.31 in)
	Dimensions for inner package Width x Height x Depth	190 x 112 x 240 mm (7.5 x 4.4 x 9.4 in)
	Dimensions for master package Width x Height x Depth (12 pcs inside)	400 x 358 x 500 mm (15.7 x 14.1 x 19.7 in)
	Weight for inner package	0.6 kg (1.32 lb)
	Weight for master package (12 pcs inside)	8.2 kg (18.1 lb)

Parallel Kit Features

Model		SRVPK001	Remark
Temperature	**Operating**	0 to 40 °C (32 to 104 °F)	
	Storage	-10 to 70 °C (13.4 to 158 °F)	
Humidity	**Operating**	0 to 95% relative humidity, non-condensing	
Interface		VGA 15PIN	
Box Color		White	
Parallel System	**Parallel Operation Capability**	upto 3	UPSs in parallel system which is 2 or 3 units
	Power Unbalance Ratio	<5% @ 100% Load	$P_R\% = \frac{\lvert P_i - P_{AVE} \rvert}{P_{AVE}} \times 100\%$
	Parallel System Output Power	Derating to 90%	$\sum_{n=1}^{N} P_n \cdot 90\ \%$
	Parallel function	Extend capacity (N)	N=2 or 3

Note: For redundancy function, both of UPSs are in system and share load.

Installation

⚠ CAUTION

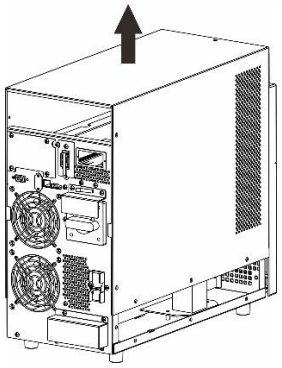
HAZARD OF ELECTRIC SHOCK

- All electrical work must be performed by a qualified electrician.
- Turn off all power to this equipment before working on the equipment. Practice lockout/tagout procedures.
- Do not wear jewelry when working with electrical equipment.

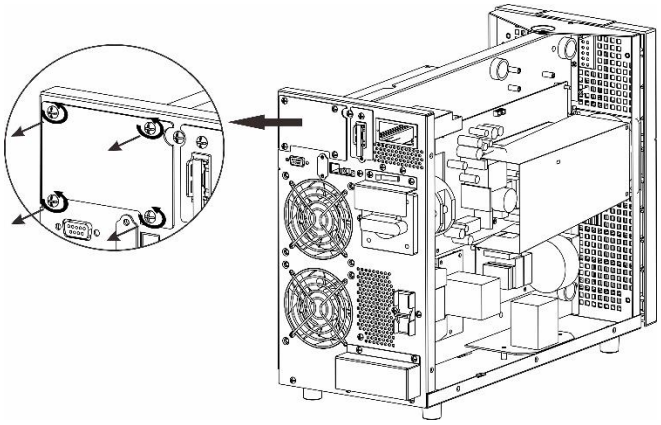
Failure to follow these instructions can result in minor or moderate injury.

Install the parallel kit to Tower Type UPS

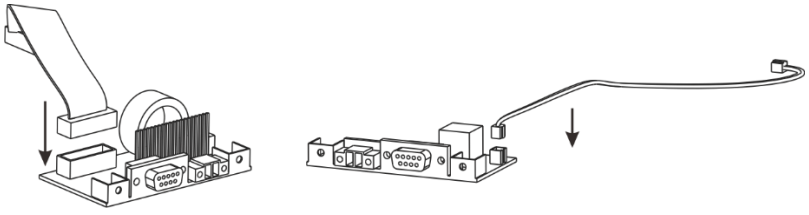
1. Remove the screws securing the top cover and remove the UPS cover.



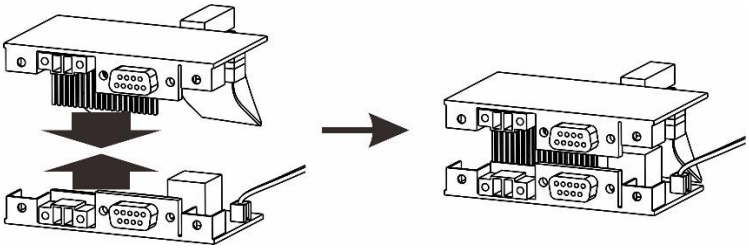
2. Remove the screws securing the share current and parallel port cover and remove the cover.



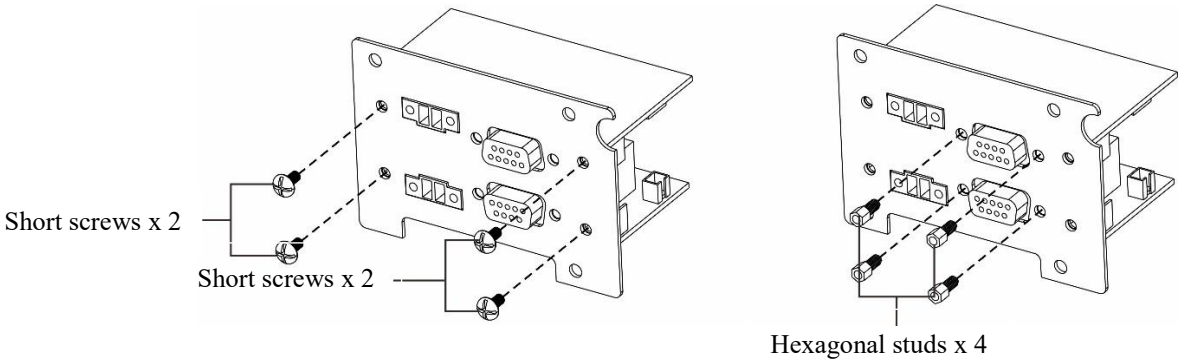
3. Connect the 14 pin black cable (140 mm) supplied, to Connector CN1 on the Master Board. Connect the 2 pin black cable (370 mm) supplied, to the connector CN9 on the Slave board.



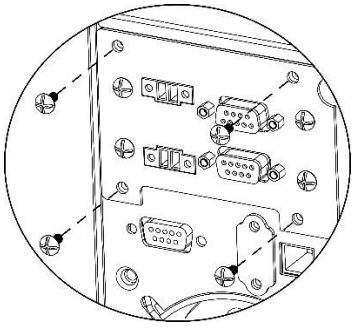
4. Assemble both the parallel boards together. Be sure pins from master board get inserted into the slot on slave board.



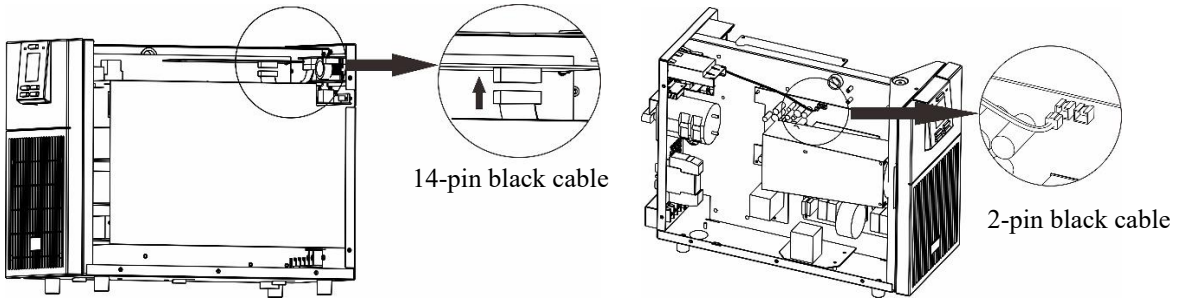
5. Secure the parallel board cover (supplied) to the assembled parallel boards with 4 hexagonal studs and 4 short screws supplied.



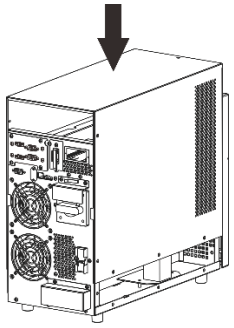
6. Secure the parallel board cover (with the parallel boards secured to it), on the UPS rear panel using 4 short screws (supplied).



7. Connect the free end of the 14-pin black cable (140 mm) to connector CN11 on the control board. Connect the free end of the 2-pin black cable (370 mm) to connector CN17 on the charger board.

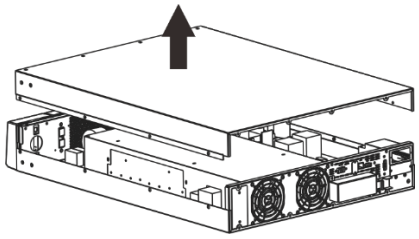


8. Replace and secure the top cover removed in step 1.

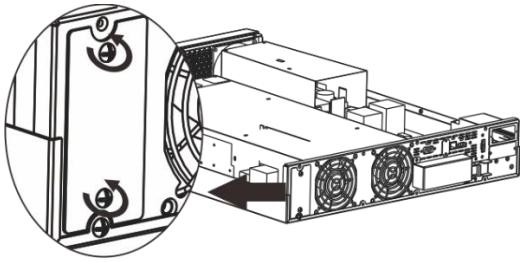


Install the parallel kit to Rack Type UPS

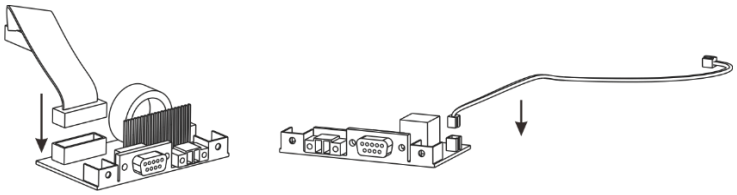
1. Remove the screws securing the top cover and remove the top cover.



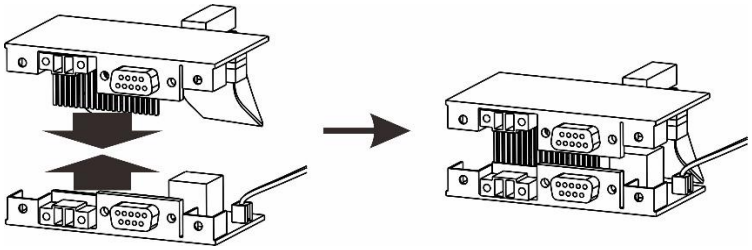
2. Remove covers of share current port and parallel port by unscrewing 2 screws.



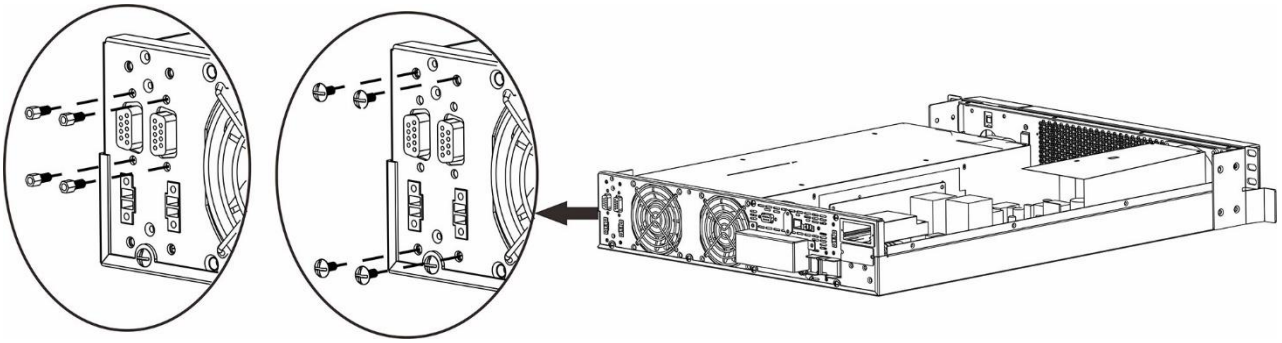
3. Connect the 14 pin black cable (140 mm) supplied, to Connector CN1 on the upper parallel board. Connect the 2 pin black cable (370 mm) supplied, to the connector CN9 on the bottom parallel board.



4. Assemble both the parallel boards together. Be sure pins from master board get inserted into the slot on slave board.

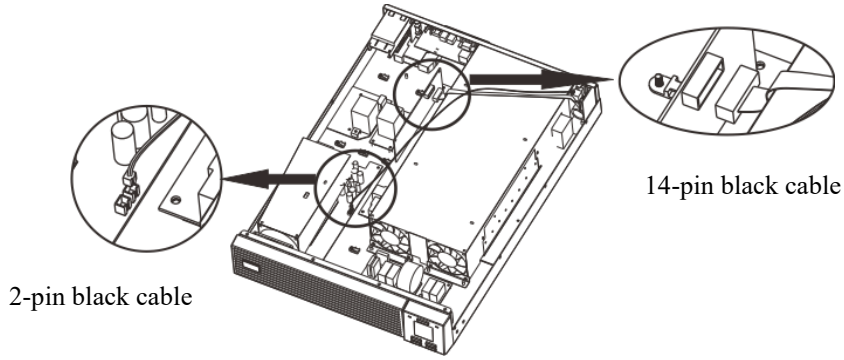


5. Secure the assembled parallel boards to the UPS rear panel using the supplied hexagonal studs (4 nos.) and short screws (4 nos.).



Hexagonal studs x 4 Short screws x 4

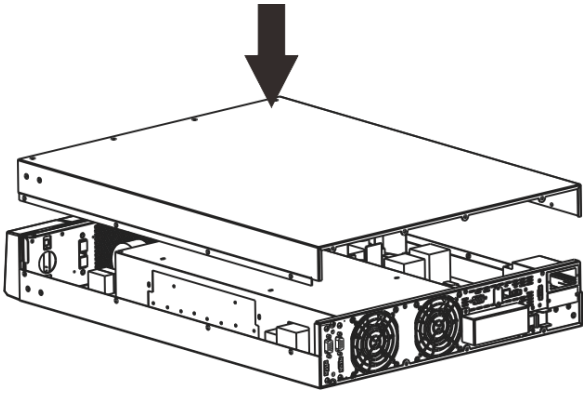
6. Connect the 14 pin black cable (140 mm) supplied, to Connector CN1 on the upper parallel board. Connect the 2 pin black cable (370 mm) supplied, to the connector CN9 on the bottom parallel board.



14-pin black cable

2-pin black cable

7. Replace and secure the top cover removed in step 1.



Wiring Connection for Parallel Operation

⚠ CAUTION

RISK OF ELECTRIC SHOCK

- Adhere to all national and local electrical codes.
- All electrical work must be performed by a qualified electrician.
- Turn off all power to this equipment before working on the equipment.
- Switch the external circuit breaker. Practice lockout/tagout procedures.
- Do not wear jewelry when working with electrical equipment.
- Select wire size and connectors according to national and local codes.

Failure to follow these instructions can result in minor or moderate injury.

Connecting select 6000 VA and 10000 VA Easy UPS Online Extended Runtime models to get high flexibility during future maintenance and upgrades.

Two Tower type UPSs in parallel system:
Required accessories: Two parallel cables and two share current cables.

1. Use one share current cable Ⓐ and plug one end into share current port ❶ of # 1 UPS. Plug the other end of share current cable Ⓐ into share current port ❷ of # 2 UPS. Use one more share current cable Ⓑ and plug one end into share current port ❸ of # 1 UPS. Plug the other end of share current cable Ⓑ into share current port ❹ of #2 UPS.
2. Use one parallel cable Ⓒ and plug one end into parallel port ❺ of # 1 UPS. Plug the other end of parallel cable Ⓒ into parallel port ❻ of # 2 UPS. Use one more parallel port Ⓓ and plug one end into parallel port ❼ of # 1 UPS. Plug the other end of parallel cable Ⓓ into parallel port ❽ of # 2 UPS.

   Note: Stressing cables during installation will cause bad connections or damage the wires in the cables.

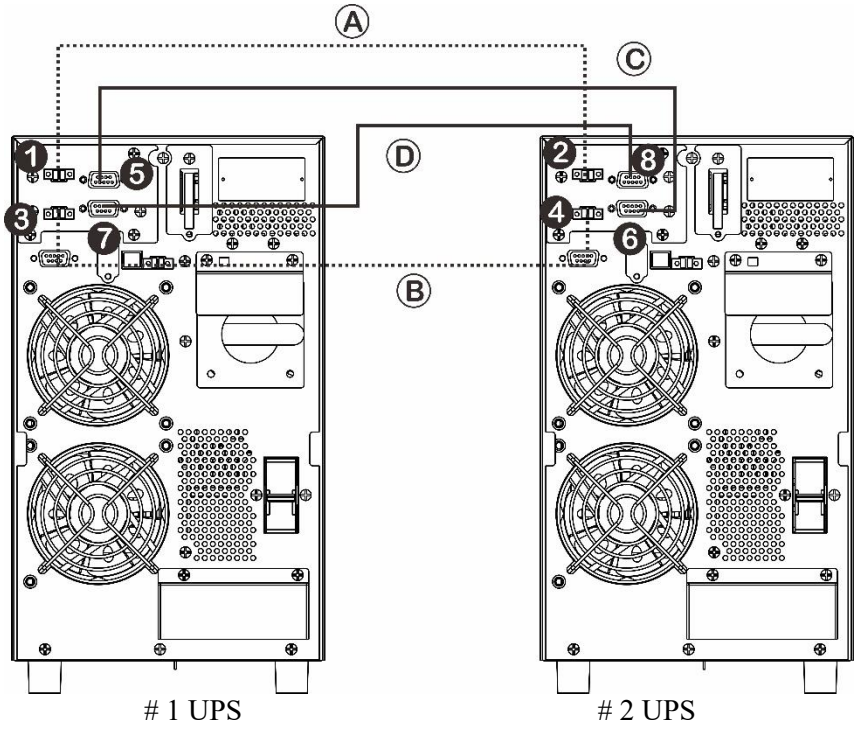


Fig 1 Parallel cable and Share current cable connection between two Tower type UPSs in parallel system

Three Tower type UPSs in parallel system:

Required accessories: Three parallel cables and three share current cables.

1. Use one share current cable Ⓐ and plug one end into share current port ❶ of # 1 UPS. Plug the other end of share current cable Ⓐ into share current port ❷ of # 3 UPS. Use second share current cable Ⓑ and plug one end into share current port ❸ of # 1 UPS. Plug the other end of share current cable Ⓑ into share current port ❹ of #2 UPS. Use third share current cable Ⓒ and plug one end into share current port ❺ of # 2 UPS. Plug the other end of share current cable Ⓒ into share current port ❻ of # 3 UPS.
2. Use one parallel cable Ⓓ and plug one end into parallel port ❼ of # 1 UPS. Plug the other end of parallel cable Ⓓ into parallel port ❽ of # 3 UPS. Use second parallel port Ⓔ and plug one end into parallel port ❾ of # 1 UPS. Plug the other end of parallel cable Ⓔ into parallel port ❿ of # 2 UPS. Use third parallel cable Ⓕ and plug one end into parallel port ⓫ of # 2 UPS. Plug the other end of parallel cable Ⓕ into parallel port ⓬ of # 3 UPS.

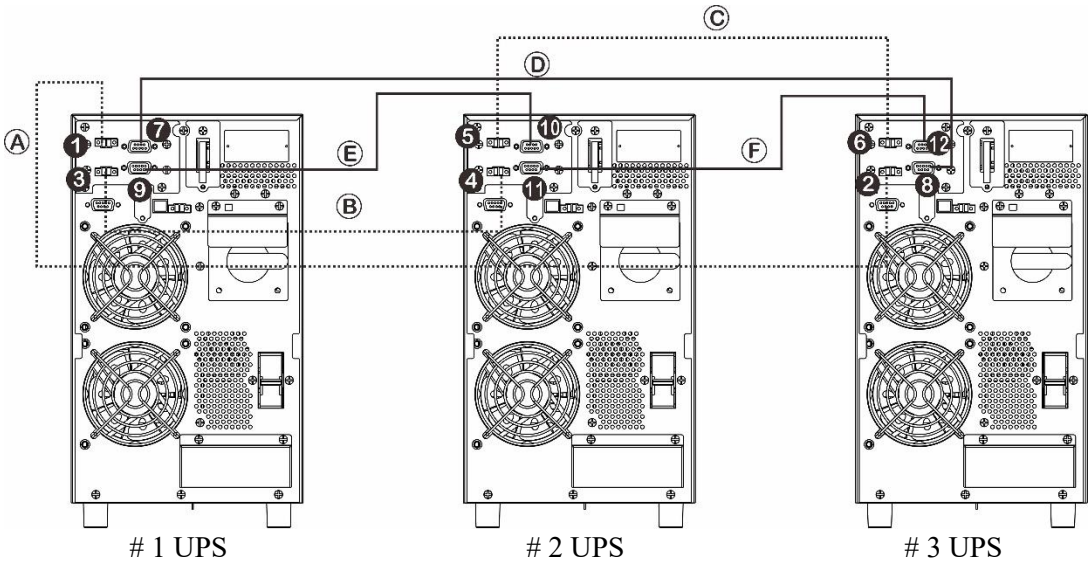


Fig 2 Parallel cable and Share current cable connection between three Tower type UPSs in parallel system

Two Rack type UPSs in parallel system:

Required accessories: Two parallel cables and two share current cables.

1. Use one share current cable Ⓐ and plug one end into share current port ❶ of # 1 UPS. Plug the other end of share current cable Ⓐ into share current port ❷ of # 2 UPS. Use one more share current cable Ⓑ and plug one end into share current port ❸ of # 1 UPS. Plug the other end of share current cable Ⓑ into share current port ❹ of #2 UPS.
2. Use one parallel cable Ⓒ and plug one end into parallel port ❺ of # 1 UPS. Plug the other end of parallel cable Ⓒ into parallel port ❻ of # 2 UPS. Use one more parallel port Ⓓ and plug one end into parallel port ❼ of # 1 UPS. Plug the other end of parallel cable Ⓓ into parallel port ❽ of # 2 UPS.

Note: Stressing cables during installation will cause bad connections or damage the wires in the cables.

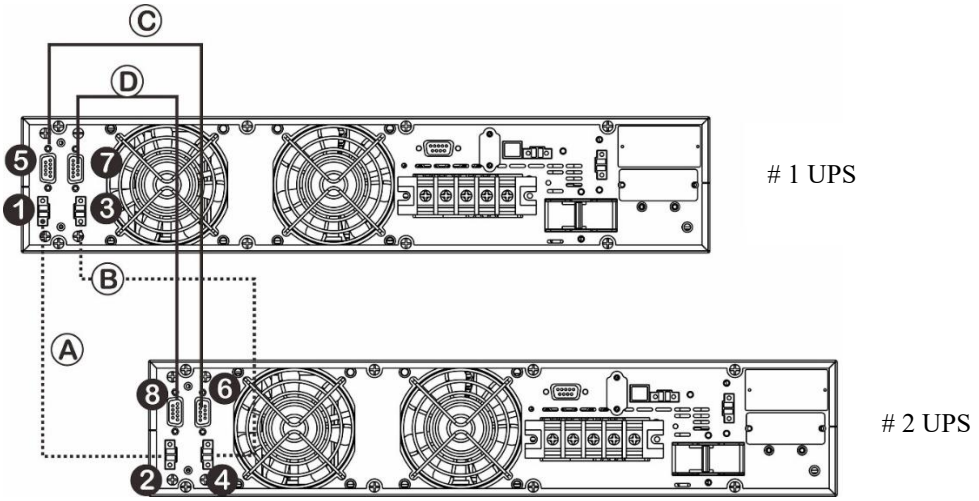


Fig 3 Parallel cable and Share current cable connection between two Rack type UPSs in parallel system

Three Rack type UPSs in parallel system:

Required accessories: Three parallel cables and three share current cables.

3. Use one share current cable Ⓐ and plug one end into share current port ❶ of # 1 UPS. Plug the other end of share current cable Ⓐ into share current port ❷ of # 3 UPS. Use second share current cable Ⓑ and plug one end into share current port ❸ of # 1 UPS. Plug the other end of share current cable Ⓑ into share current port ❹ of #2 UPS. Use third share current cable Ⓒ and plug one end into share current port ❺ of # 2 UPS. Plug the other end of share current cable Ⓒ into share current port ❻ of # 3 UPS.
4. Use one parallel cable Ⓓ and plug one end into parallel port ❼ of # 1 UPS. Plug the other end of parallel cable Ⓓ into parallel port ❽ of # 3 UPS. Use second parallel port Ⓔ and plug one end into parallel port ❾ of # 1 UPS. Plug the other end of parallel cable Ⓔ into parallel port ❿ of # 2 UPS. Use third parallel cable Ⓕ and plug one end into parallel port ⓫ of # 2 UPS. Plug the other end of parallel cable Ⓕ into parallel port ⓬ of # 3 UPS.

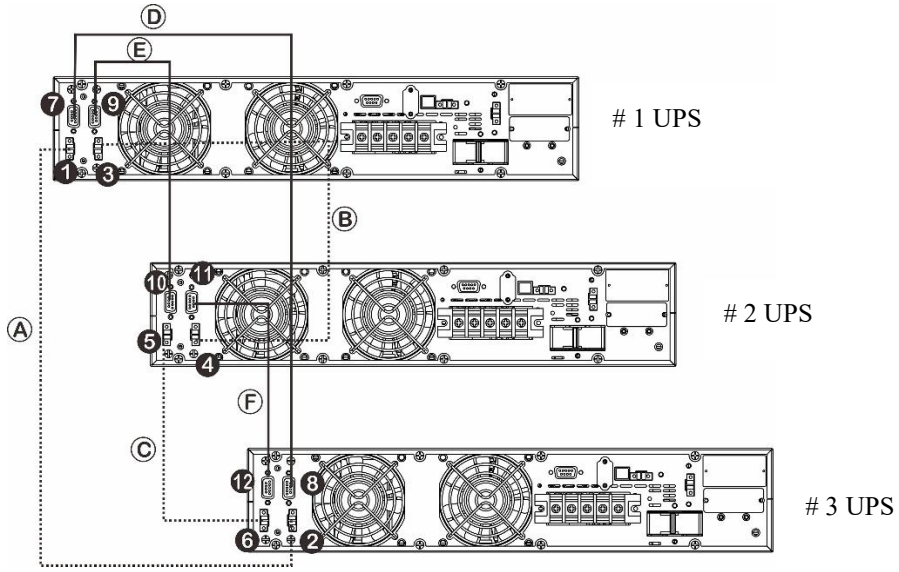


Fig 4 Parallel cable and Share current cable connection between three Rack type UPSs in parallel system

5. Connect input, output, ground and input neutral wires between two UPSs as below:

NOTE: It is recommended to follow wire AWG as below.

SKU	Input	Input Neutral	Output	Output Neutral	Battery	Ground
6000 VA	10 (5.26 mm^2)	10 (5.26 mm^2)	10 (5.26 mm^2)	10 (5.26 mm^2)	10 (5.26 mm^2)	10 (5.26 mm^2)
10000 VA	8 (8.36 mm^2)	8 (8.36 mm^2)	8 (8.36 mm^2)	8 (8.36 mm^2)	8 (8.36 mm^2)	8 (8.36 mm^2)

Pass output wire through magnetic ring (refer to A in fig. 5 and fig. 6) and wind four turns.

Note: Neutral breaker should be turned on when adding one UPS into the parallel system. When removing one UPS from the parallel system, it's necessary to shut down whole system and turn off this neutral breaker.

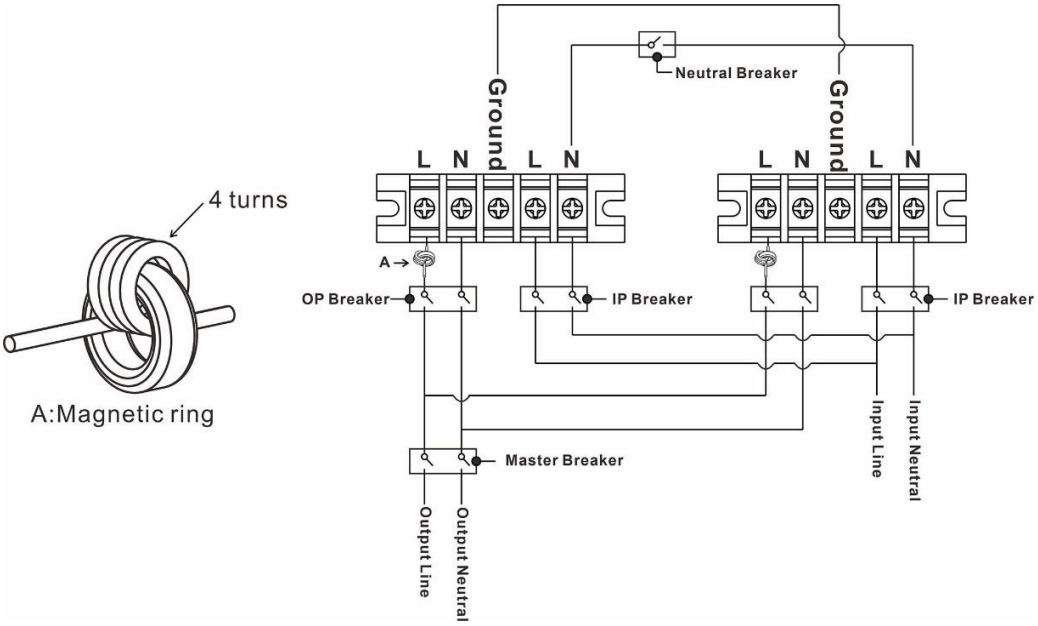


Fig 5 Power wiring between two UPSs in parallel system

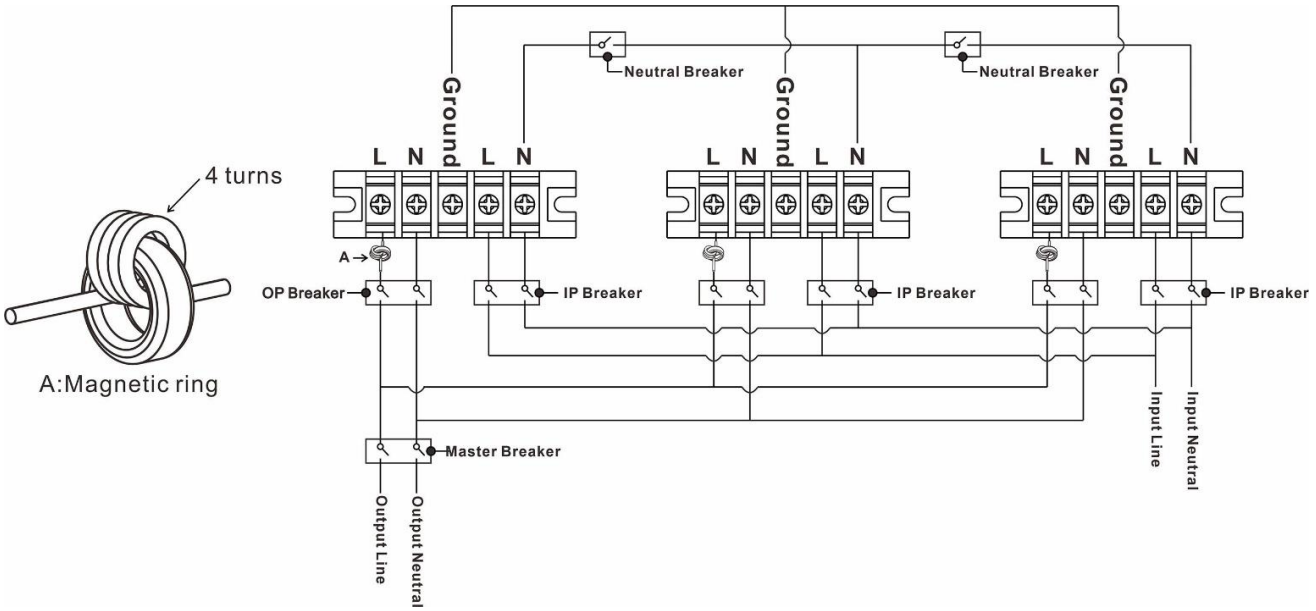


Fig 6 Power wiring between three UPSs in parallel system

If an external battery pack is connected to the UPS, install a battery breaker (DC type) in each UPS.
Recommended specifications for breakers

SKU	I/P Breaker	O/P Breaker	Neutral Breaker	Battery Breaker
6000VA	230Vac/50A/2P/D	230Vac/50A/2P/D	230Vac/50A/1P/D	500Vdc/50A/2P/C
10000VA	230Vac/63A/2P/D	230Vac/63A/2P/D	230Vac/63A/1P/D	500Vdc/63A/2P/C

Recommended to install a breaker (AC type, D Curve) for input and output in each UPS.
NOTE: Each UPS must be connected to an independent battery pack.

UPS Parallel System Operation

If the UPS is available for parallel operation, check and follow the steps below:

1) Calibrate the inverter and output voltages. Refer UPS manual for details.
   a) Disconnect the parallel communication and share current cables.
   b) Turn on the UPS and calibrate the inverter and output voltages. The voltage difference between the UPS should be less than 1 V. Refer to UPS settings section in the UPS user manual for details.
   c) Shut down the UPS to store the calibration parameters.
2) Re-install the parallel communication and share current cables disconnected in step 1a.
3) Connect the output wires of each UPS to an output breaker.
4) Connect all output breakers to the master breaker.
5) Connect the load (equipment) directly to the master breaker.
6) Be sure that each UPS is connected to an independent battery pack.

NOTE: In parallel system, a UPS cannot share same battery pack with other UPSs as it will render the UPS inoperable.

7) Turn on the input breakers and the DC breakers (if an external battery pack is connected to the UPS).
8) Wait until P01, P02 are displayed on the LCD display.
9) Turn on each UPS one at a time (refer to UPS user manual for details).
10) Wait until all the UPS turn on and go into line mode. System is ready for parallel operation.

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  - **www.apc.com/support/**
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