PARALLEL FUNCTION

1. Introduction

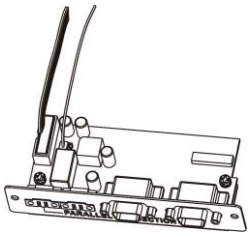
This inverter can be used in parallel for two applications.

1. Parallel operation in single phase with up to 9 units. The supported maximum output power is 27KW/27KVA for 3KW model and 45KW/45KVA for 5KW model.
2. Maximum 9 units work together to support three-phase equipment. Seven units support one phase maximum. For 3KW model, the supported maximum output power is 27KW/27KVA and one phase can be up to 21KW/21KVA. For 5KW model, the supported maximum output power is 45KW/45KVA and one phase can be up to 35KW/35KVA.

NOTE: If this unit is bundled with share current cable and parallel cable, this inverter is default supported parallel operation. You may skip section 3. If not, please purchase parallel kit and install this unit by following instruction from professional technical personnel in local dealer.

2. Package Contents

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



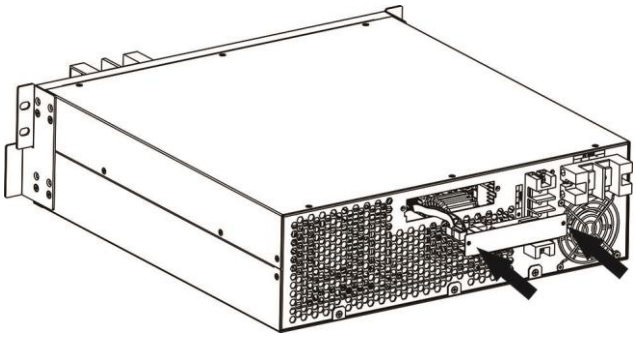
Parallel board

Parallel communication cable

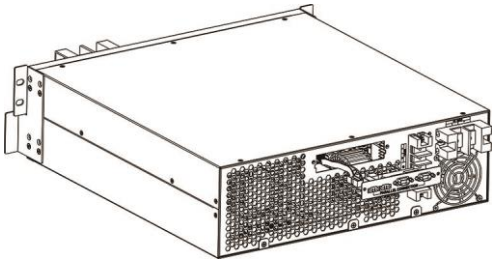
Current sharing cable

3. Parallel board installation

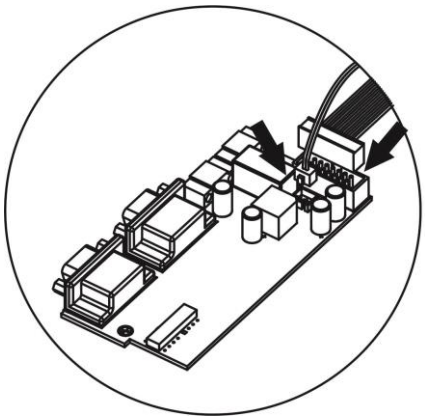
Step 1: Take out parallel cover by removing two screws as below chart and remove 2-pin and 14-pin cables.



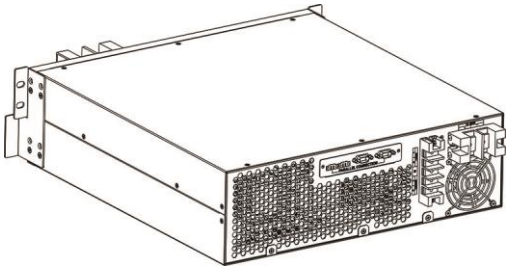
Step 2: Replace it with parallel board.



Step 3: Re-connect 2-pin and 14-pin to original position on parallel board as shown below chart.



Step 4: Put parallel cover back to the unit. Now the inverter is providing parallel operation function.



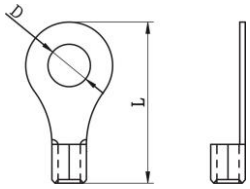
4. Wiring Connection

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

Model	Wire Size	Ring Terminal			Torque value
		Cable mm²	Dimensions		
			D (mm)	L (mm)	
3KW-24V	1*1/0AWG	60	8.4	49.7	4.5 Nm
	2*4AWG	44	8.4	49.7	
3KW-48V	1*4AWG	22	6.4	33.2	4.5 Nm
5KW	1*1/0AWG	60	8.4	49.7	4.5 Nm
	2 * 4AWG	44	8.4	49.7	

Ring terminal:



WARNING: Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

Recommended AC input and output cable size for each inverter:

Model	AWG no.	Torque
3KW-24V/3KW-48V	10 AWG	1.4~1.6Nm
5KW	8 AWG	1.4~1.6Nm

CAUTION!! Please make sure the output neutral of each unit is connected together. Otherwise, it may cause the inverter fail.

You need to connect the cables of each inverter together. Take the battery cables for example: You need to use a connector or bus-bar as a joint to connect the battery cables together, and then connect to the battery terminal. The cable size used from joint to battery should be X times cable size in the tables above. "X" indicates the number of inverters connected in parallel.

Regarding AC input and output, please also follow the same principle.

CAUTION!! Please install the breaker at the battery and AC input side. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of battery or AC input. The recommended mounted location of the breakers is shown in the figures in 5-1 and 5-2.

Recommended breaker specification of battery for each inverter:

Model	1 unit*
3KW-24V	150A/60VDC
3KW-48V	80A/80VDC
5KW	125A/80VDC

*If you want to use only one breaker at the battery side for the whole system, the rating of the breaker should be X times current of 1 unit. "X" indicates the number of inverters connected in parallel.

Recommended breaker specification of AC input:

Model	2 units	3 units	4 units	5 units	6 units	7 units	8 units	9 units
3KW-24V/3KW-48V	80A	120A	160A	200A	240A	280A	320A	360A
5KW	100A	150A	200A	250A	300A	350A	400A	450A

Note1: Also, you can use 40A breaker for 3KW and 50A for 5KW for only 1 unit and install one breaker at its AC input in each inverter.

Note2: Regarding three-phase system, you can use 4-pole breaker directly and the rating of the breaker should be compatible with the phase current limitation from the phase with maximum units

Recommended battery capacity

Inverter parallel numbers	2	3	4	5	6	7	8	9
Battery Capacity	800AH	1200AH	1600AH	2000AH	2400AH	2800AH	3200AH	3600AH

WARNING! Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

PV Connection

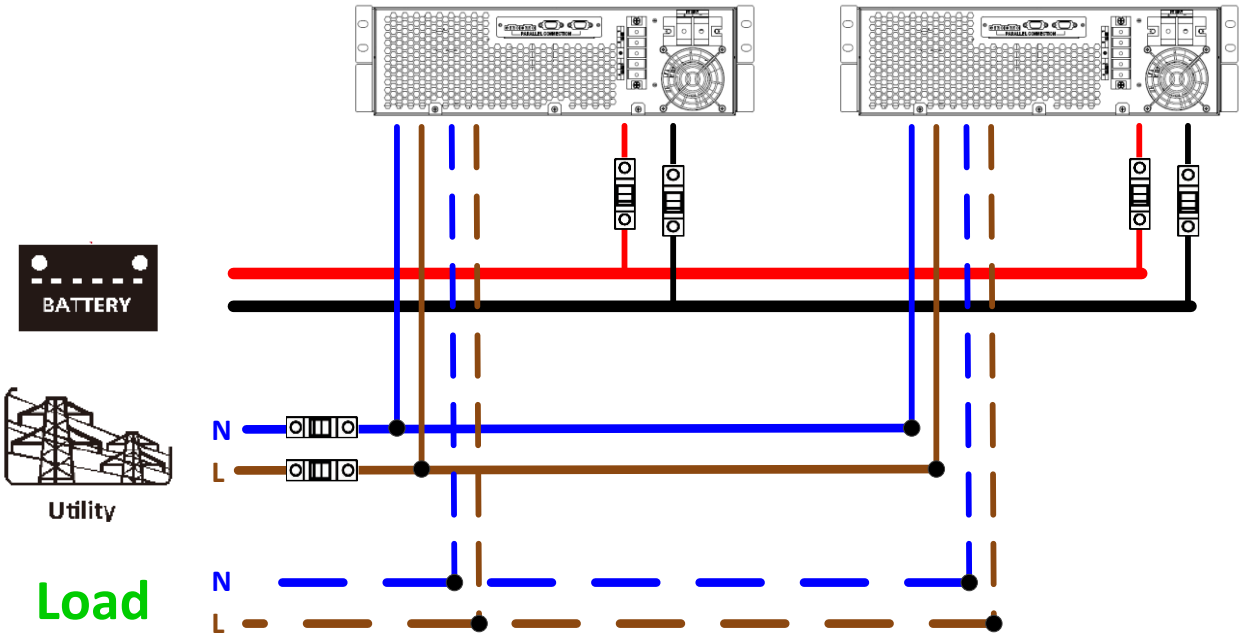
Please refer to user manual of single unit for PV Connection.

CAUTION: Each inverter should connect to PV modules separately.

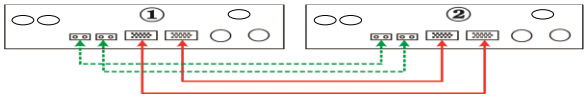
4-1. Parallel Operation in Single phase

Two inverters in parallel:

Power Connection

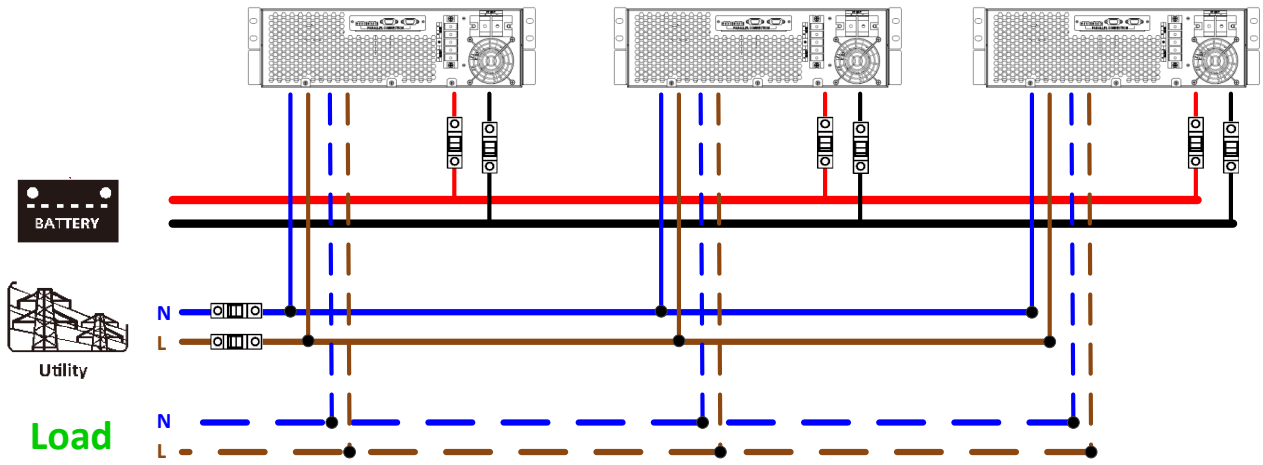


Communication Connection

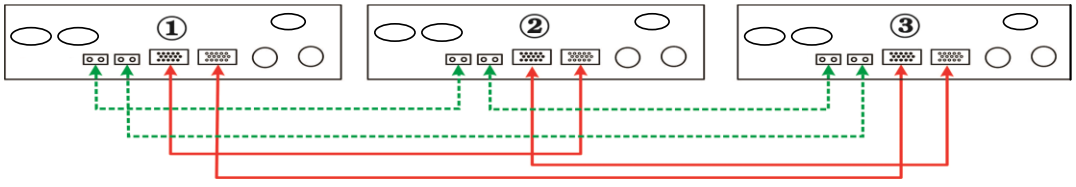


Three inverters in parallel:

Power Connection

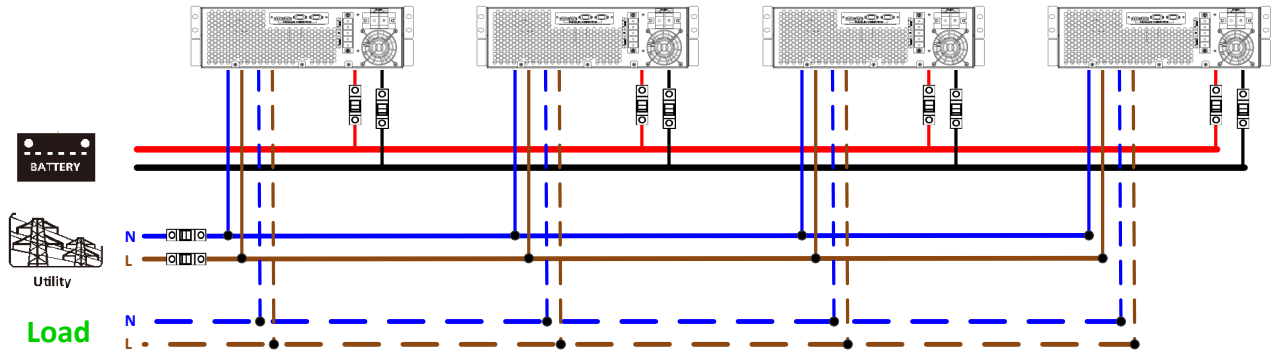


Communication Connection

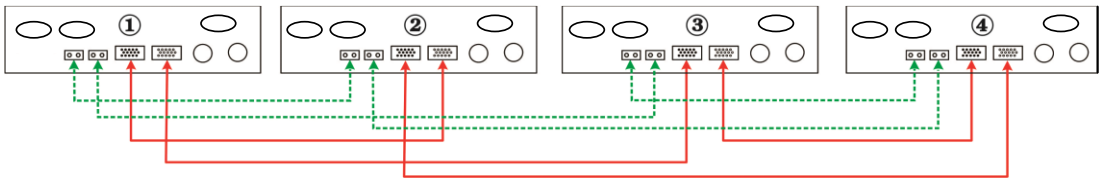


Four inverters in parallel:

Power Connection

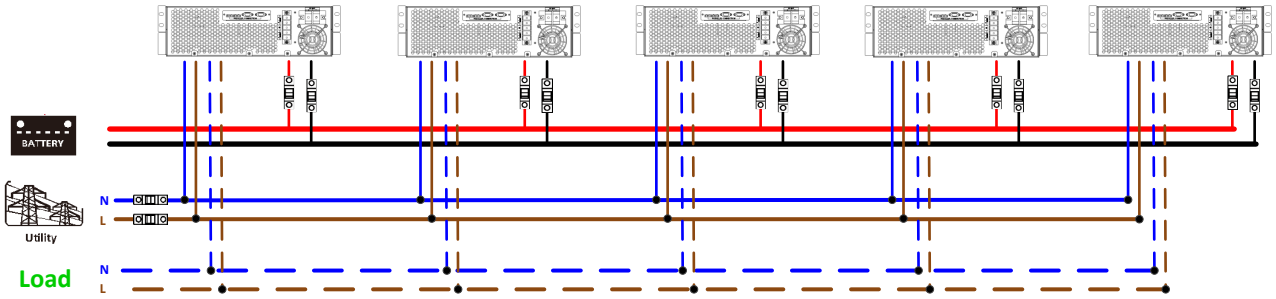


Communication Connection

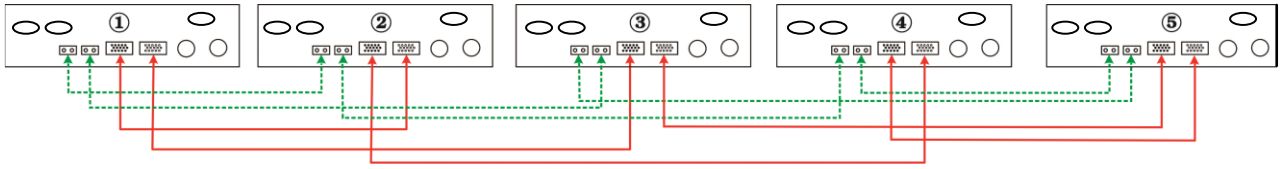


Five inverters in parallel:

Power Connection

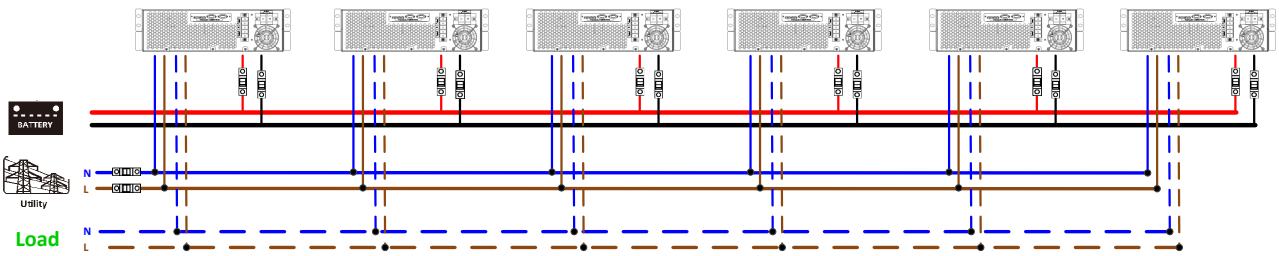


Communication Connection

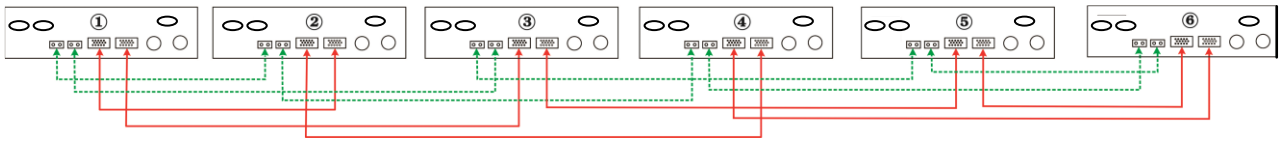


Six inverters in parallel:

Power Connection

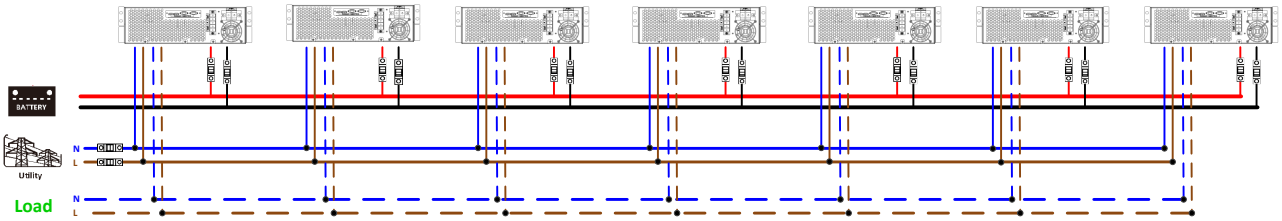


Communication Connection

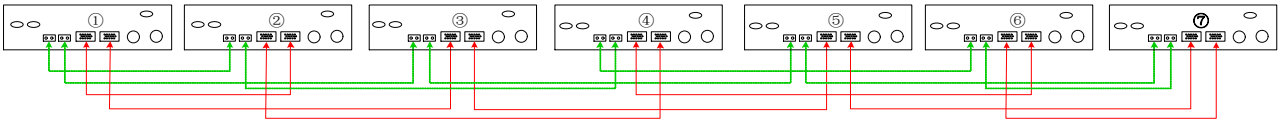


Seven inverters in parallel:

Power Connection

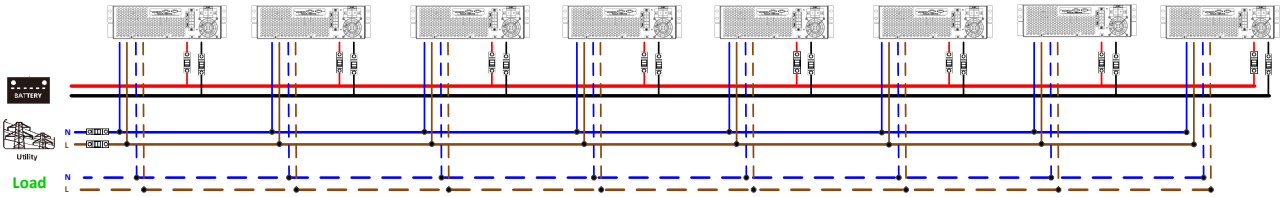


Communication Connection

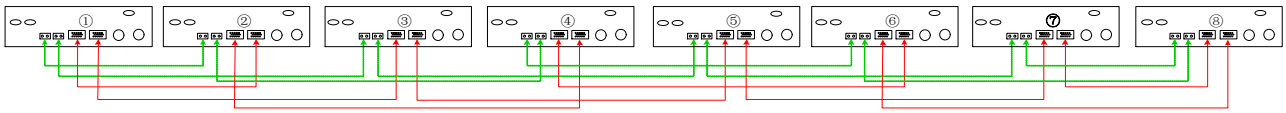


Eight inverters in parallel:

Power Connection

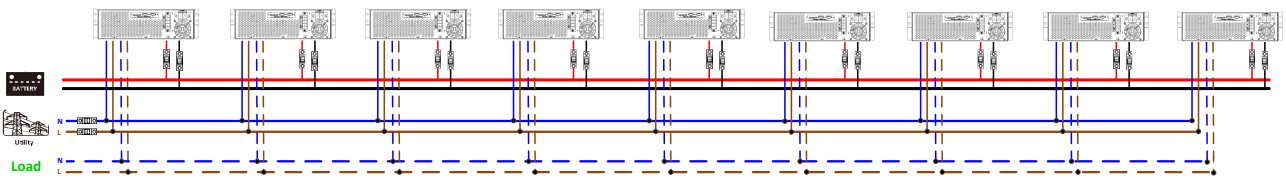


Communication Connection

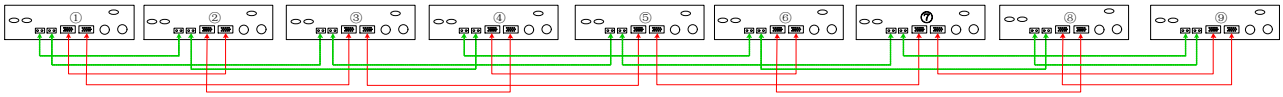


Nine inverters in parallel:

Power Connection



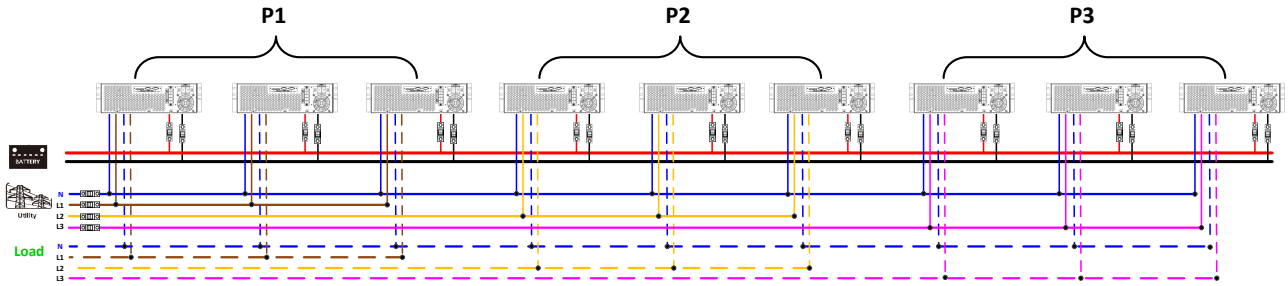
Communication Connection



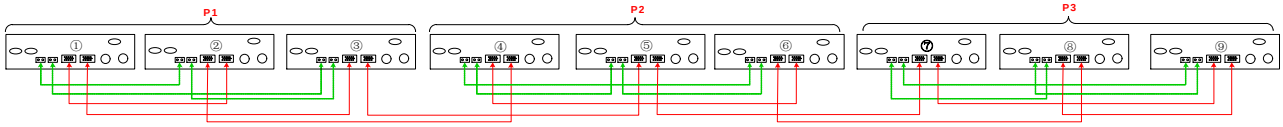
4-2. Support 3-phase equipment

Three inverters in each phase:

Power Connection



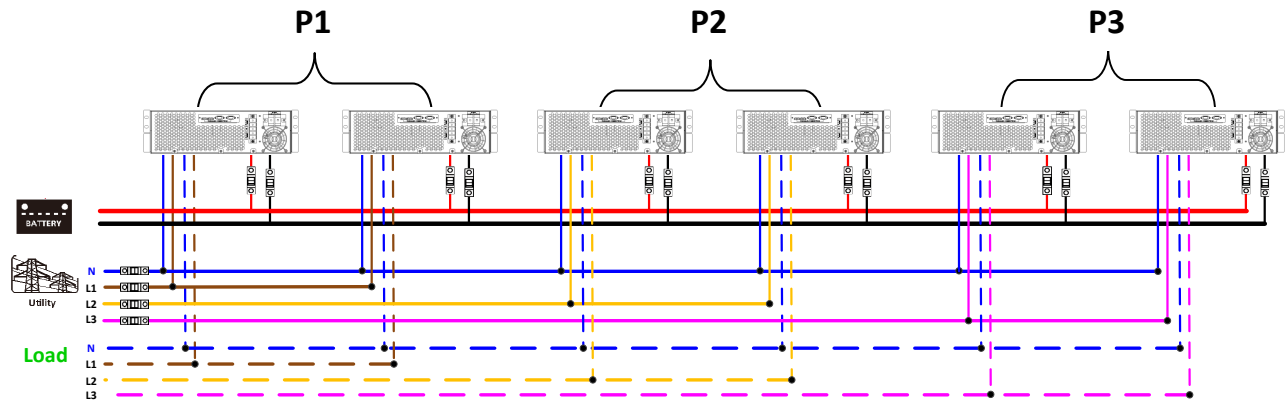
Communication Connection



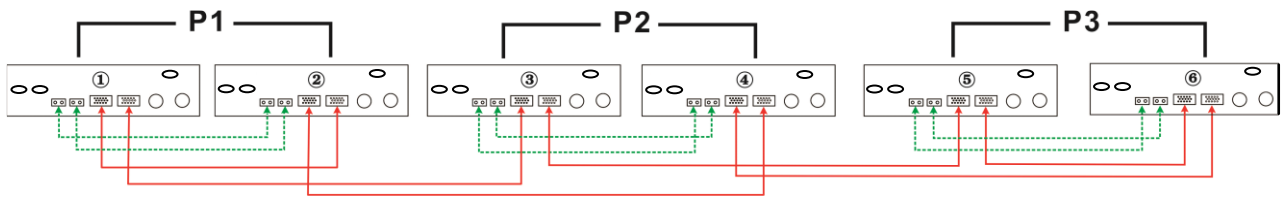
WARNING: Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.

Two inverters in each phase:

Power Connection

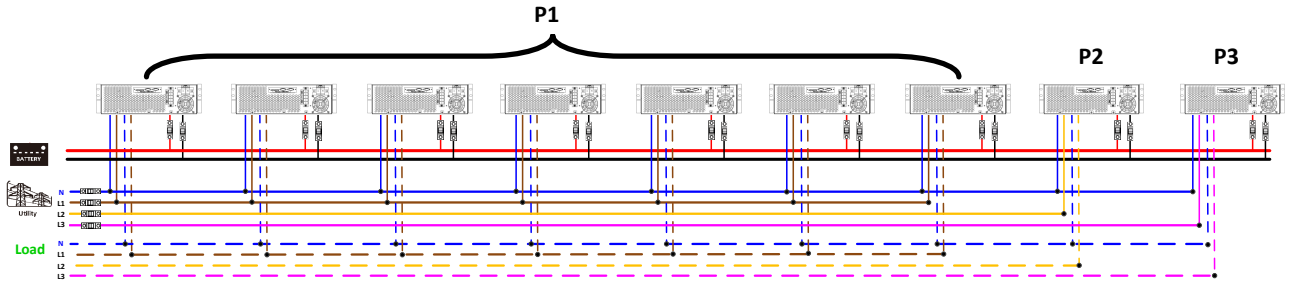


Communication Connection



Seven inverters in one phase and one inverter for the other two phases:

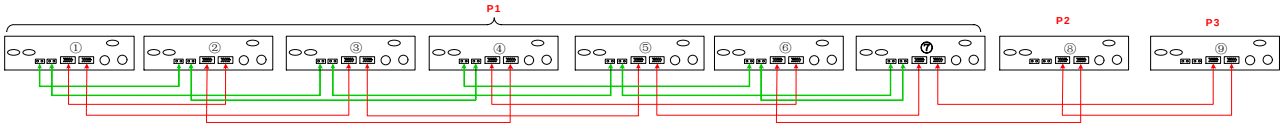
Power Connection



Note: It's up to customer's demand to pick 7 inverters on any phase.

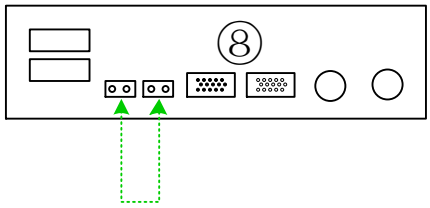
P1: L1-phase, P2: L2-phase, P3: L3-phase.

Communication Connection



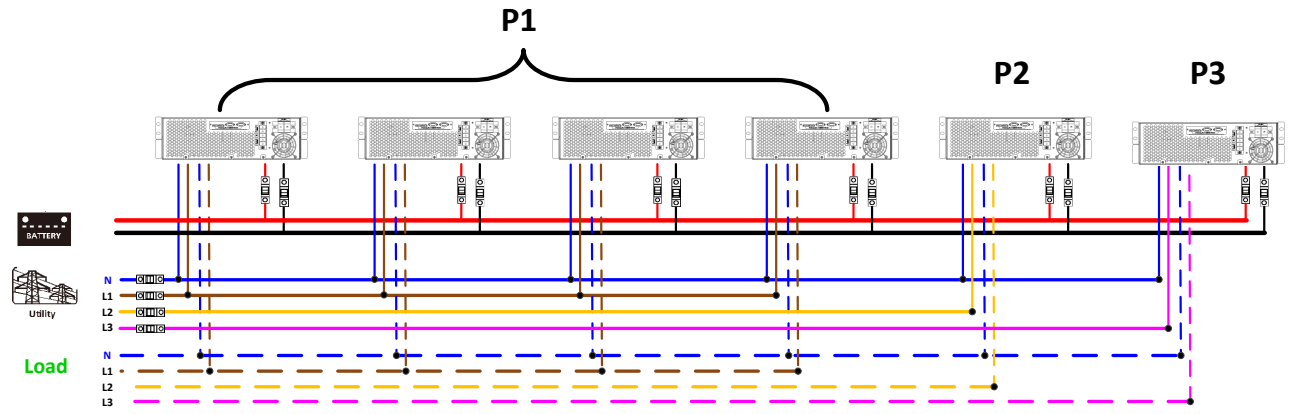
Note: If there is only one unit in one phase, this unit doesn't need to connect the current sharing cable.

Or you connect it like as below:



Four inverters in one phase and one inverter for the other two phases:

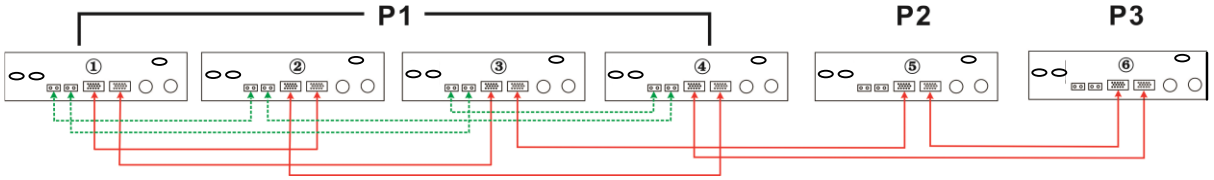
Power Connection



Note: It's up to customer's demand to pick 4 inverters on any phase.

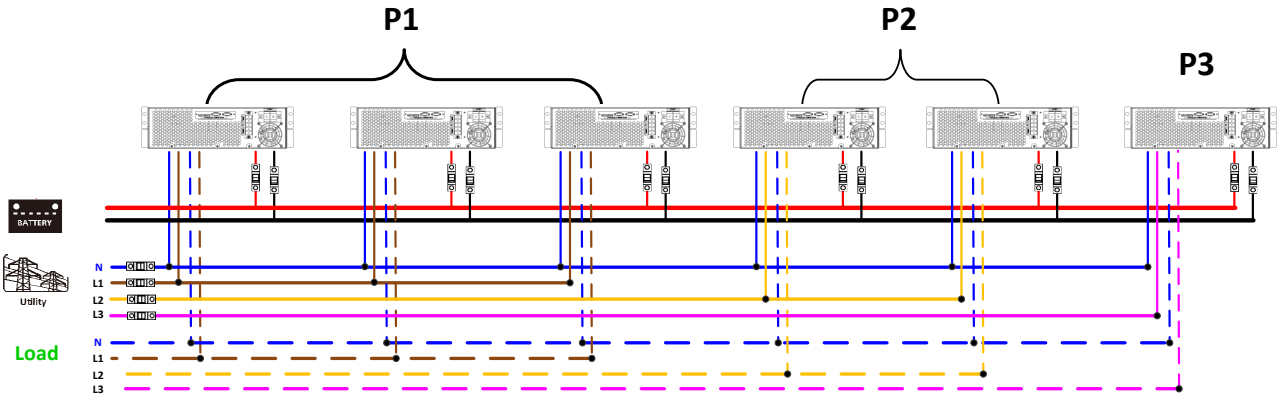
P1: L1-phase, P2: L2-phase, P3: L3-phase.

Communication Connection

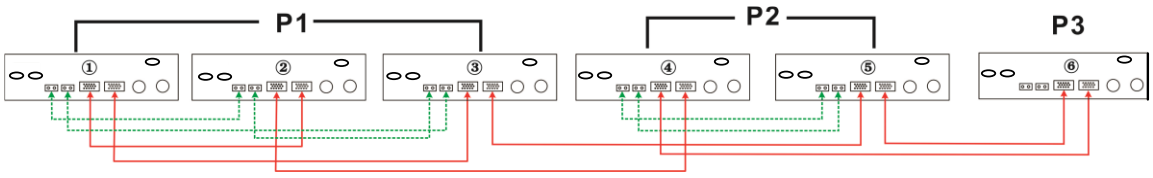


Three inverters in one phase, two inverters in second phase and one inverter for the third phase:

Power Connection

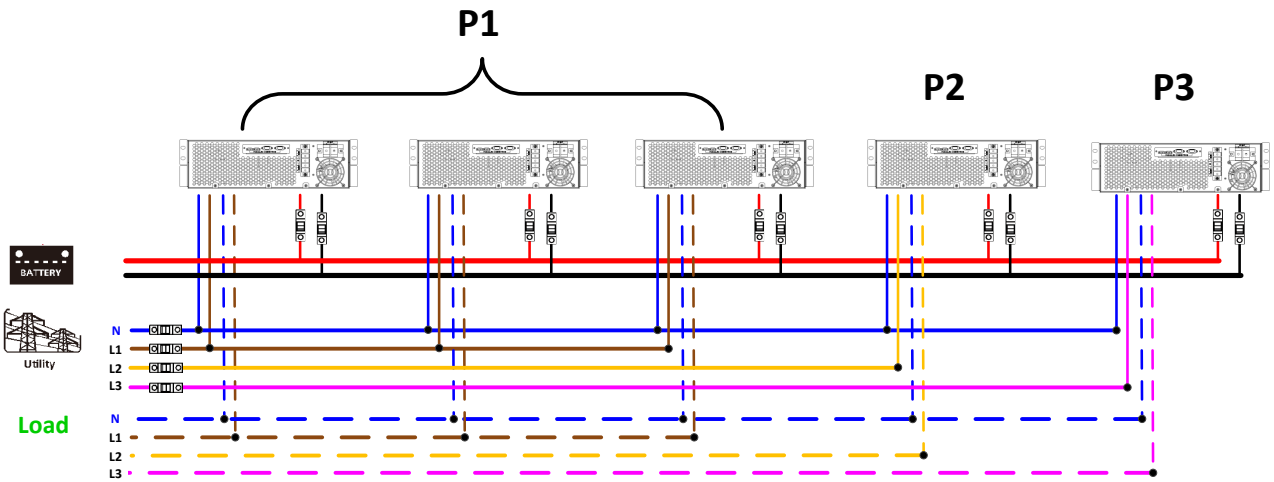


Communication Connection

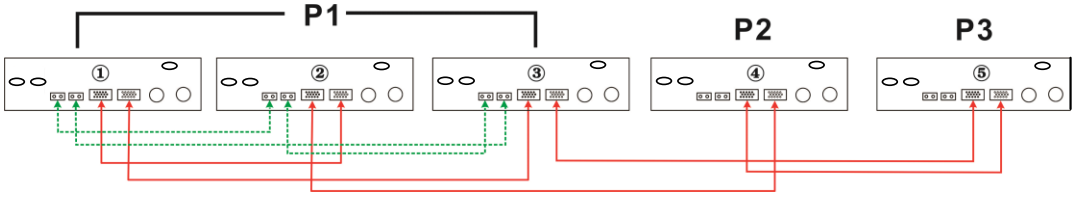


Three inverters in one phase and only one inverter for the remaining two phases:

Power Connection

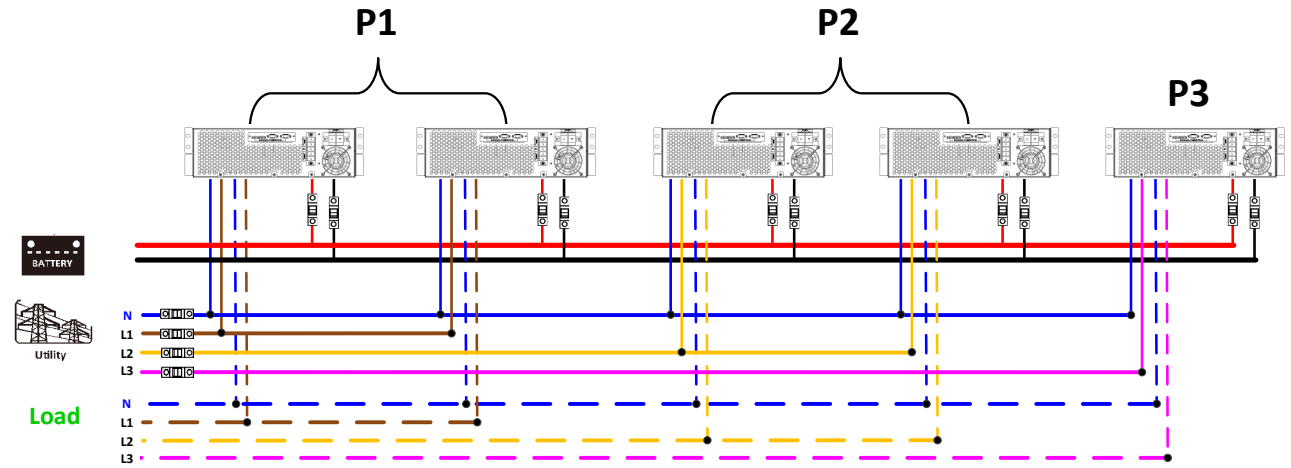


Communication Connection

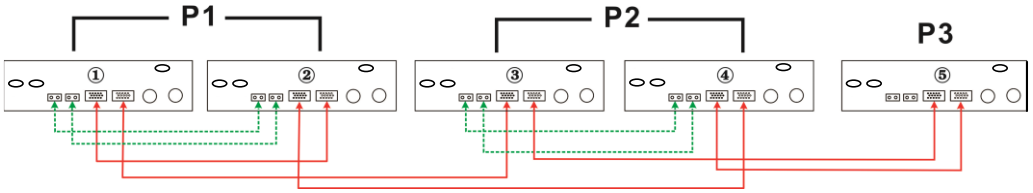


Two inverters in two phases and only one inverter for the remaining phase:

Power Connection

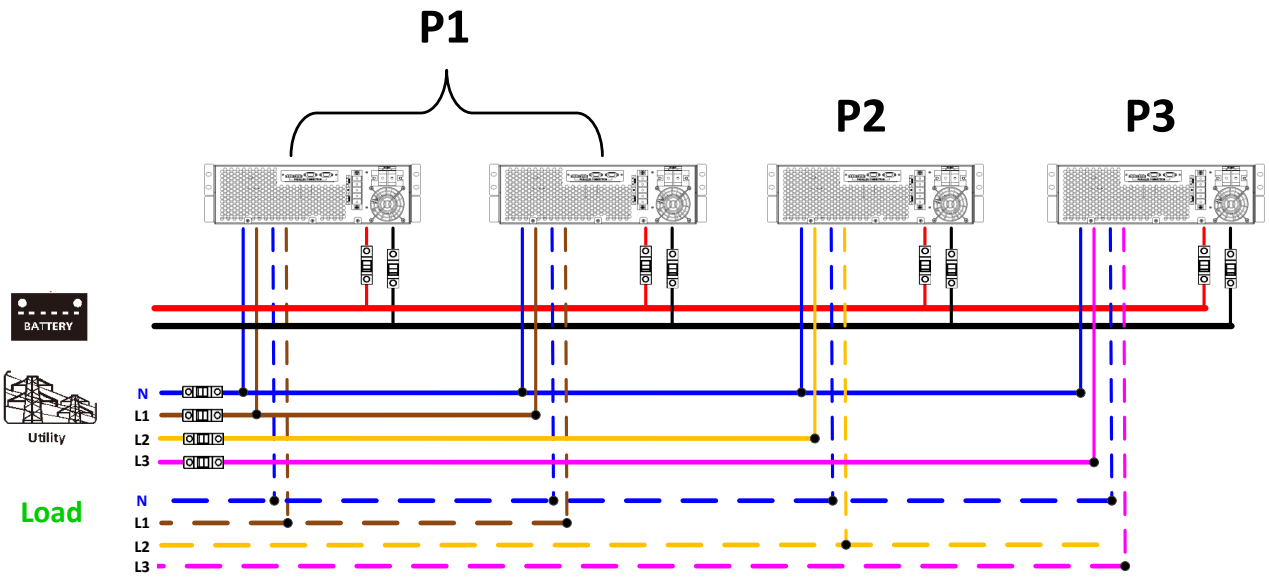


Communication Connection

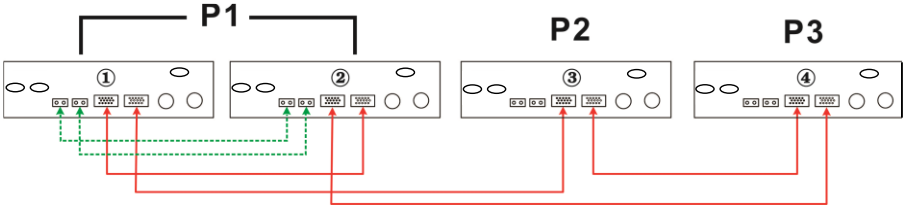


Two inverters in one phase and only one inverter for the remaining phases:

Power Connection

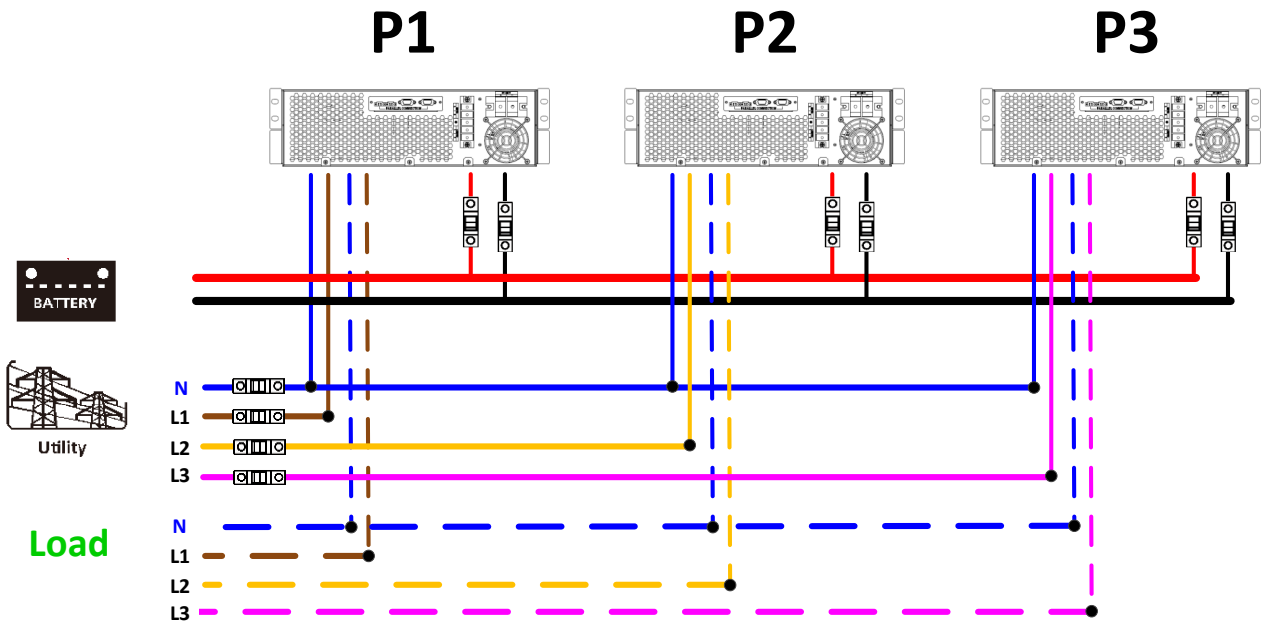


Communication Connection

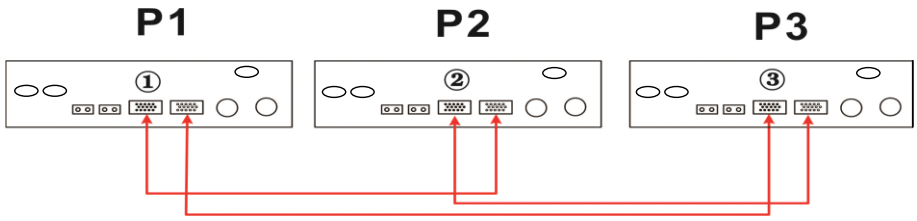


One inverter in each phase:

Power Connection



Communication Connection



WARNING: Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.