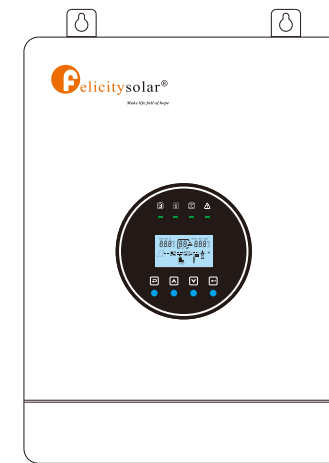


Solar inverter

PARALLEL GUIDE

Solar Inverter IVEM-LV Series



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1. INTRODUCTION

This inverter can be used in parallel with three different operation modes.

1. Parallel operation in single phase with up to six units. The supported maximum output power is 30KW/30KVA.

2. Maximum six units work together to support three-phase equipment. Four units support one phase maximum.

The supported maximum output power is 30KW/30KVA and one phase can be up to 20KW/20KVA.

3. Maximum six units work together to support split-phase equipment. Five units support one phase maximum.

The supported maximum output power is 30KW/30KVA and one phase can be up to 25KW/25KVA.

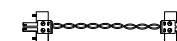
NOTE 1: Under parallel operation modes, battery must be connected with inverters.

NOTE 2: Before starting up inverters, please connect all negative(-) wires of battery together.

NOTE 3: Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

2. PACKAGE CONTENTS

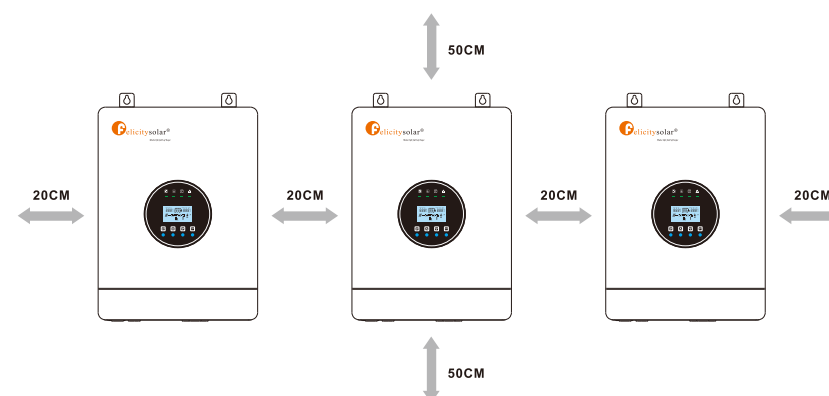
In parallel kit, you will find the following items in the package:



Parallel communication cable x 1pcs Current sharing cable x 1pcs Parallel communication connector x 1pcs

3. MOUNTING THE UNIT

When installing multiple units, please follow below chart.

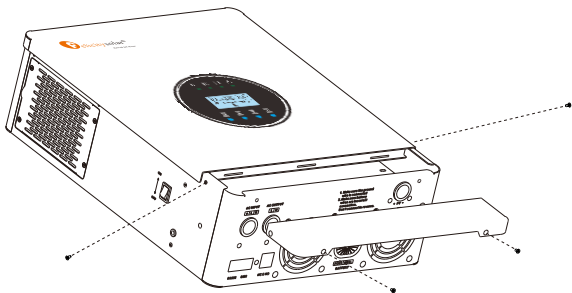


NOTE: For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.

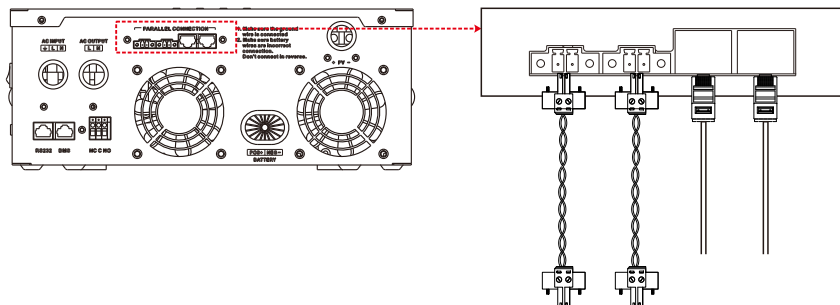
4. WIRING CONNECTION

This installation steps are only applied to 5K model.

Step 1: Remove wire cover by unscrewing all screws.



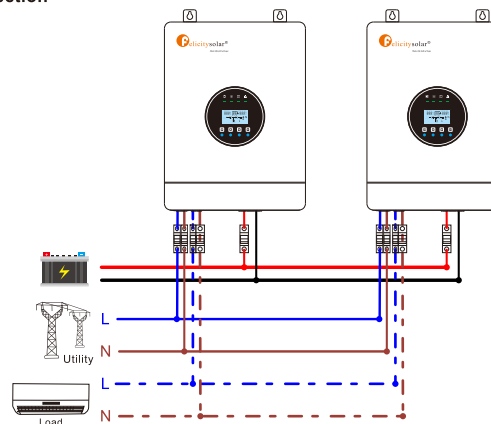
Step 2: Communication Connection



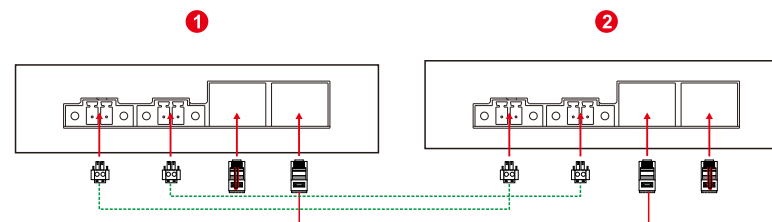
4.1 Parallel Operation in Single phase

Two inverters in parallel:

Power Connection



Communication Connection

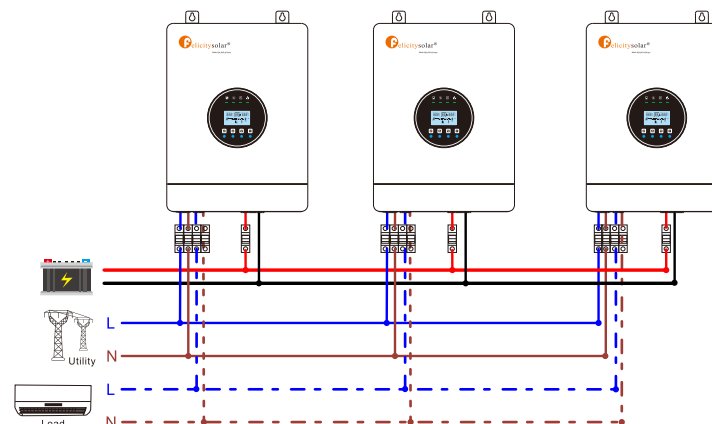


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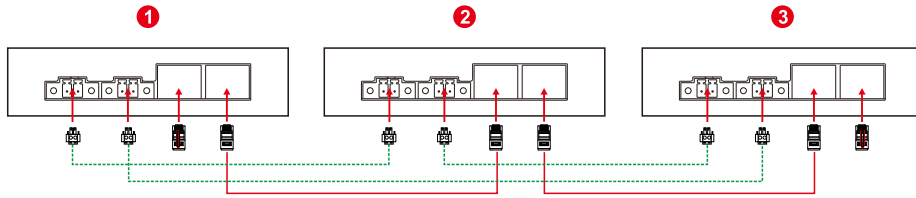
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Three inverters in parallel:

Power Connection



Communication Connection

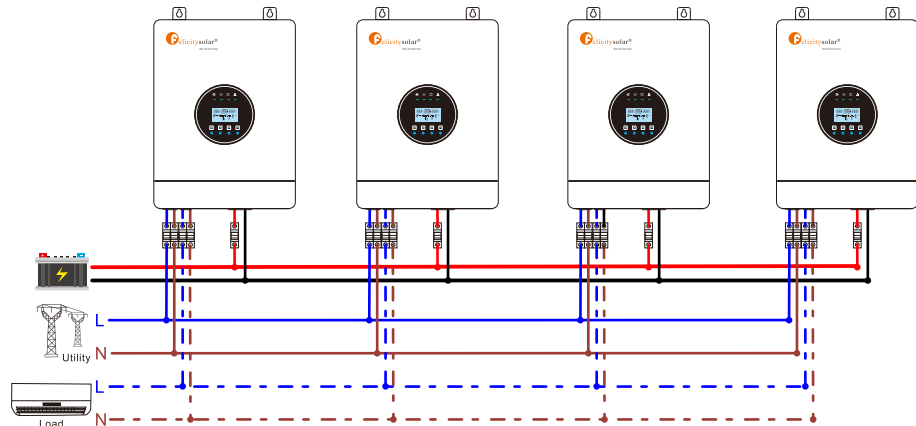


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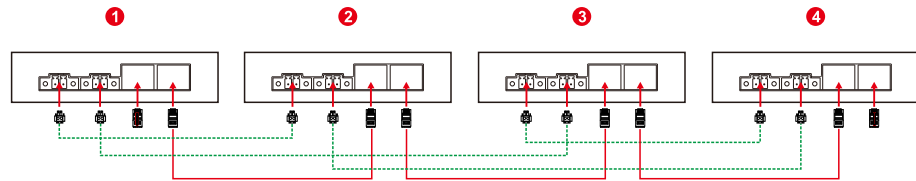
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Four inverters in parallel:

Power Connection



Communication Connection

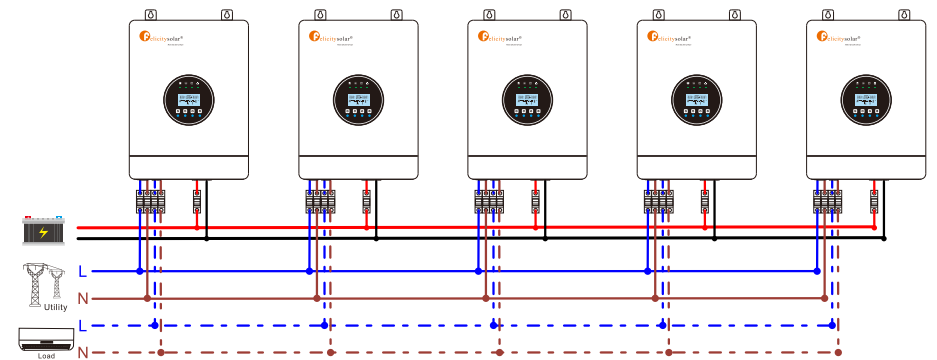


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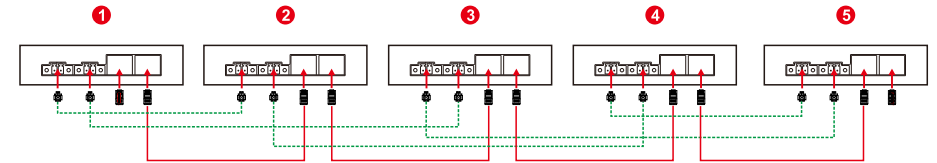
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Five inverters in parallel:

Power Connection



Communication Connection

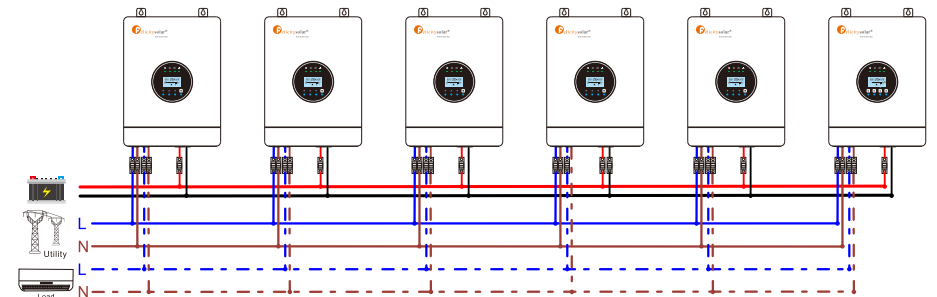


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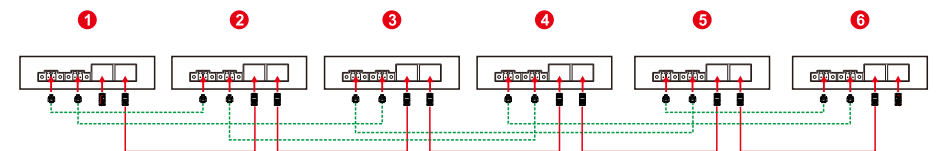
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Six inverters in parallel:

Power Connection



Communication Connection



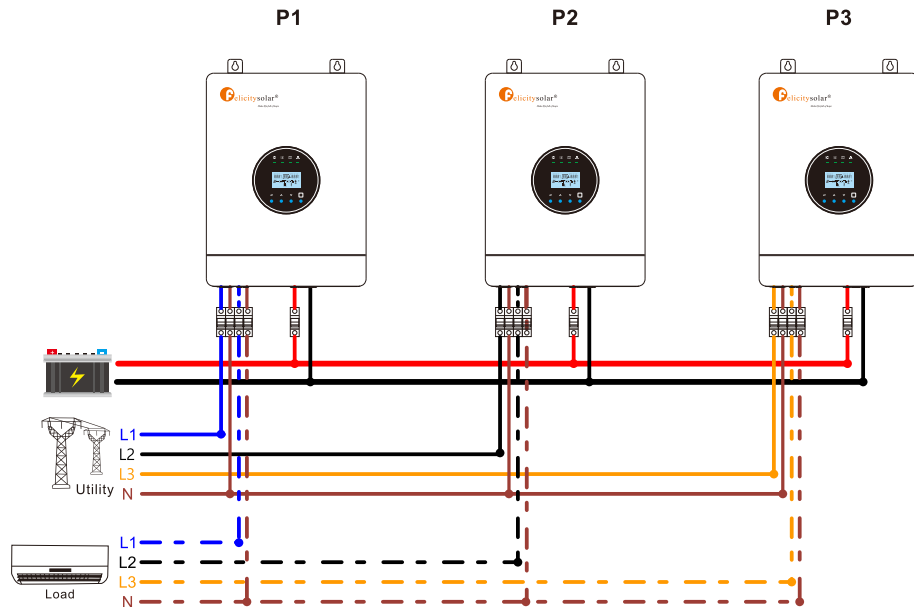
WARNING:

1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

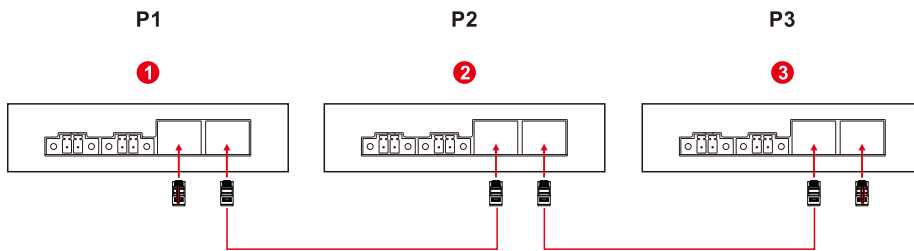
4.2 Support 3-phase equipment

One inverter in each phase:

Power Connection



Communication Connection



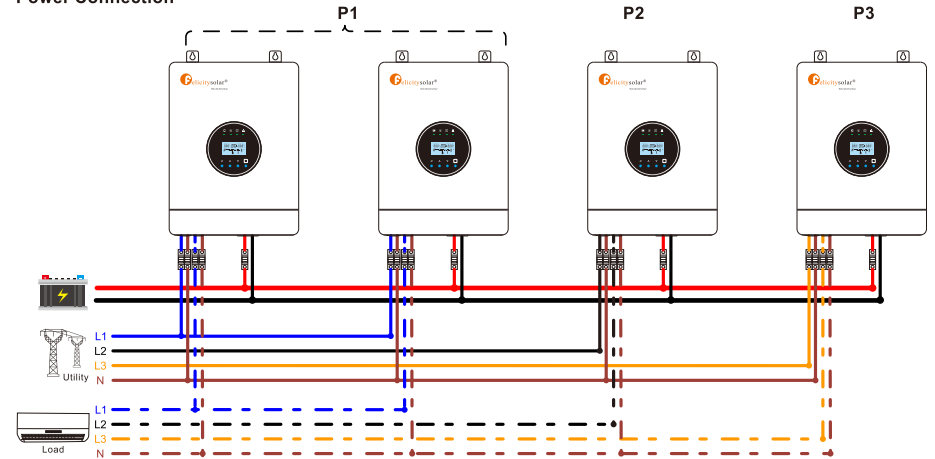
WARNING:

1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

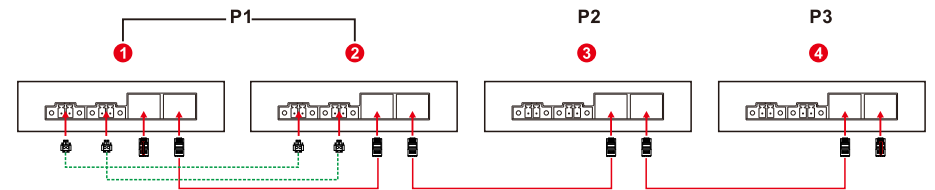
Note: P1: L1-phase, P2: L2-phase, P3: L3-phase.

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

Power Connection



Communication Connection

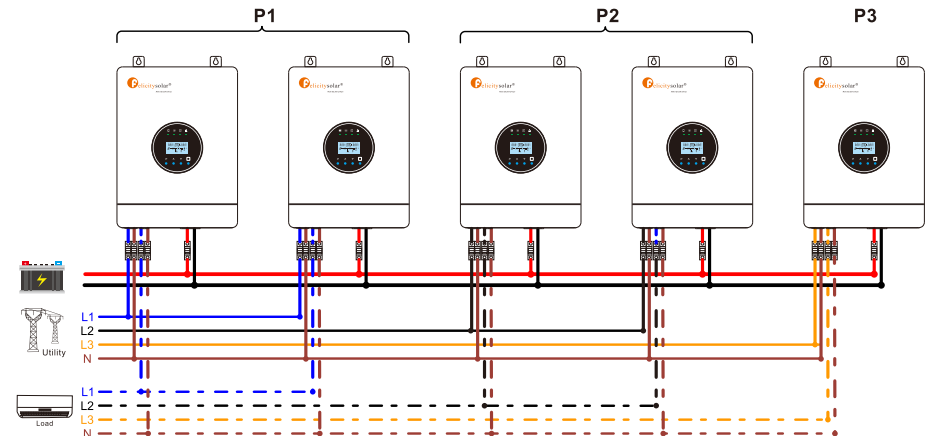


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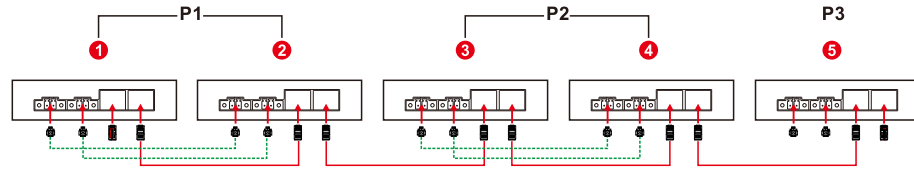
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

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

Power Connection



Communication Connection

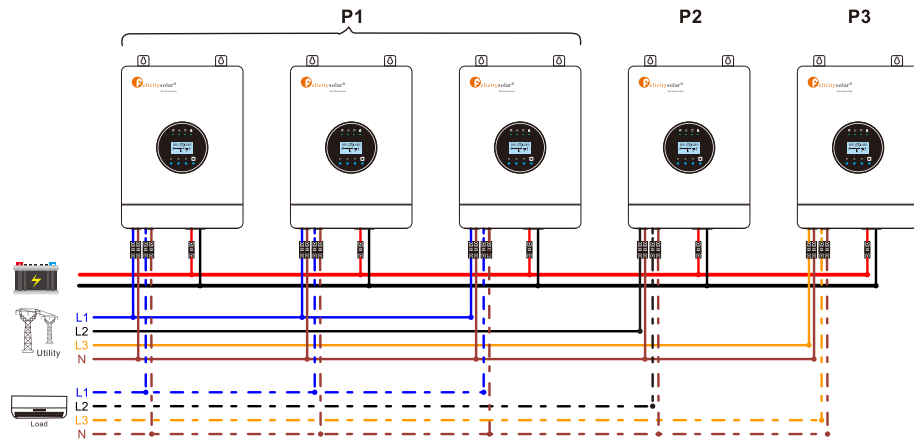


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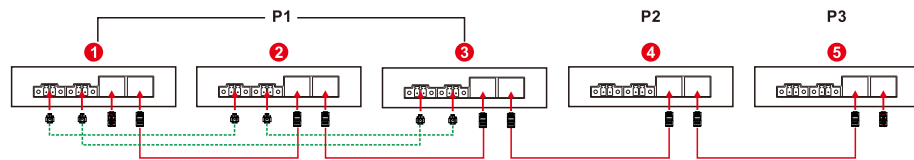
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

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

Power Connection



Communication Connection

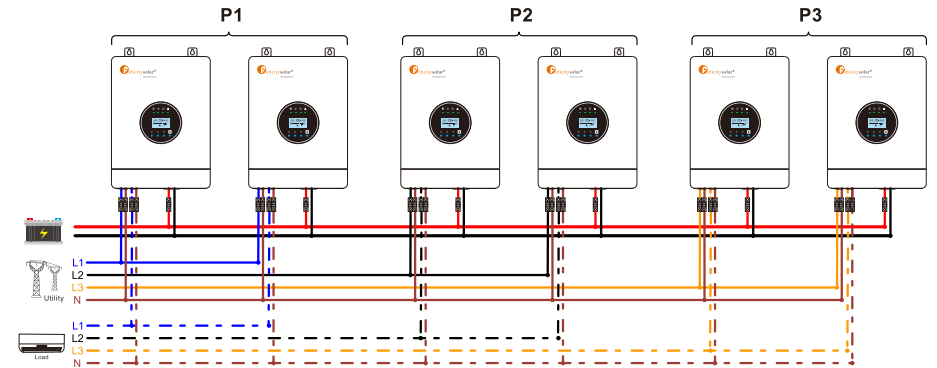


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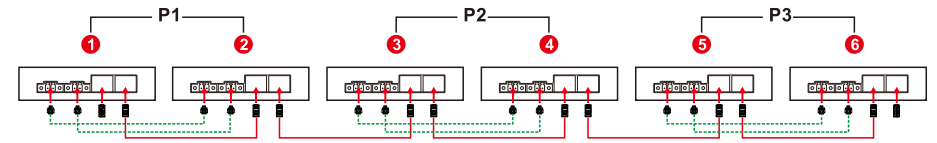
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Two inverters in each phase:

Power Connection



Communication Connection

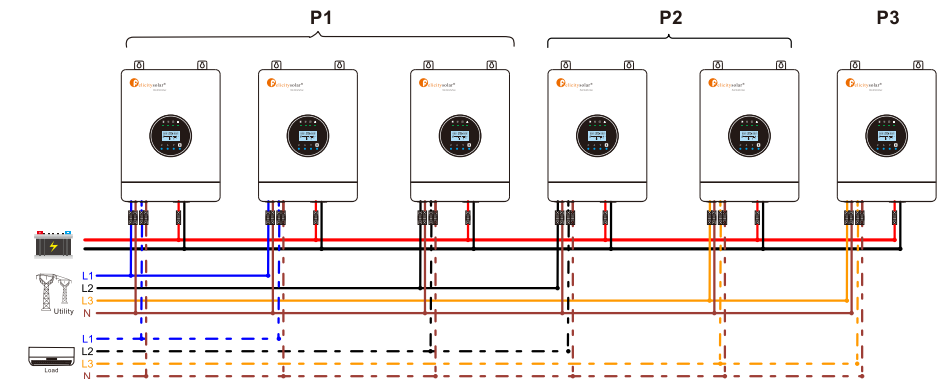


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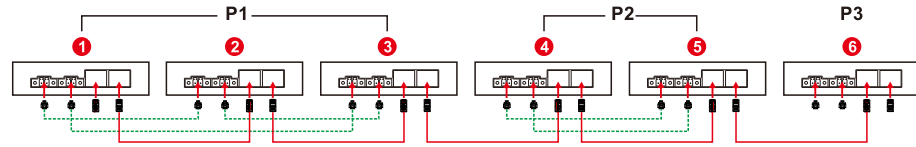
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

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

Power Connection



Communication Connection

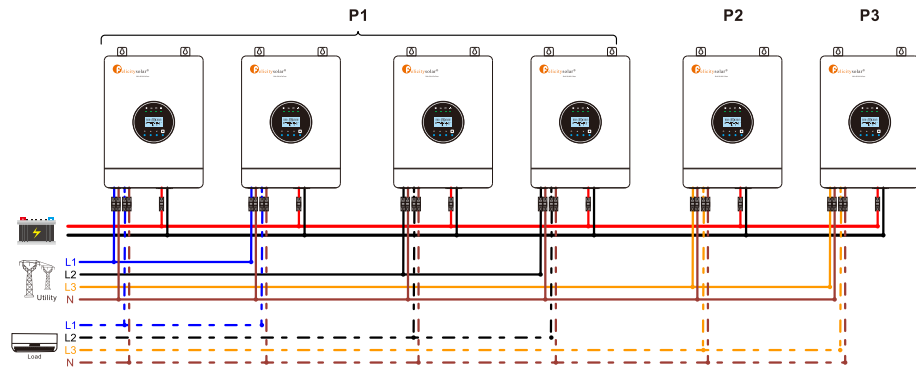


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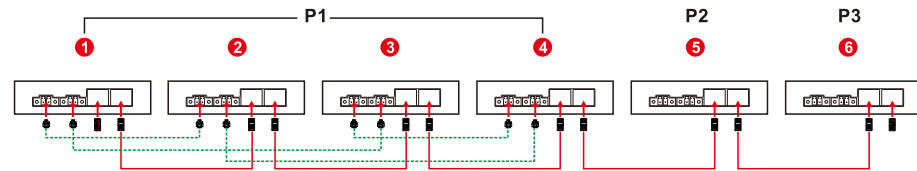
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

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

Power Connection



Communication Connection



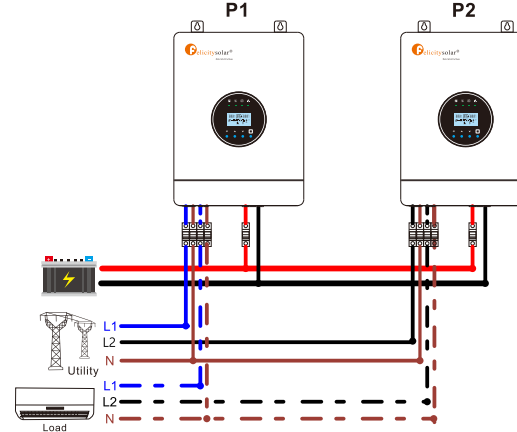
WARNING:

1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

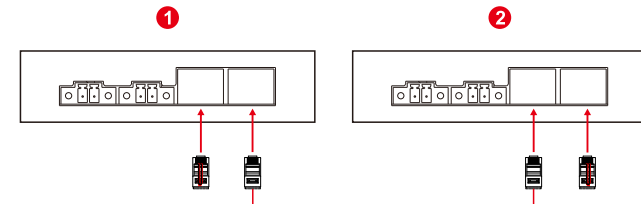
4.3 . Support split-phase equipment

One inverter in each phase:

Power Connection



Communication Connection

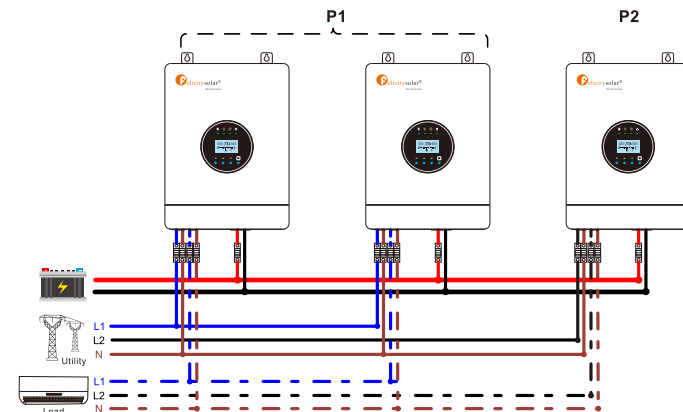


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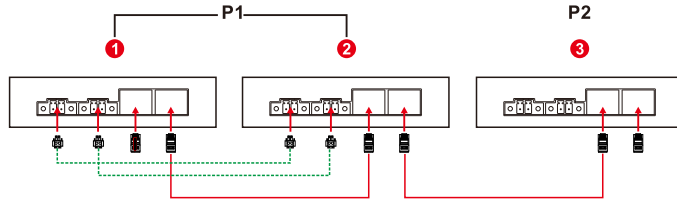
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Two inverters in one phase, one inverter in second phase :

Power Connection



Communication Connection

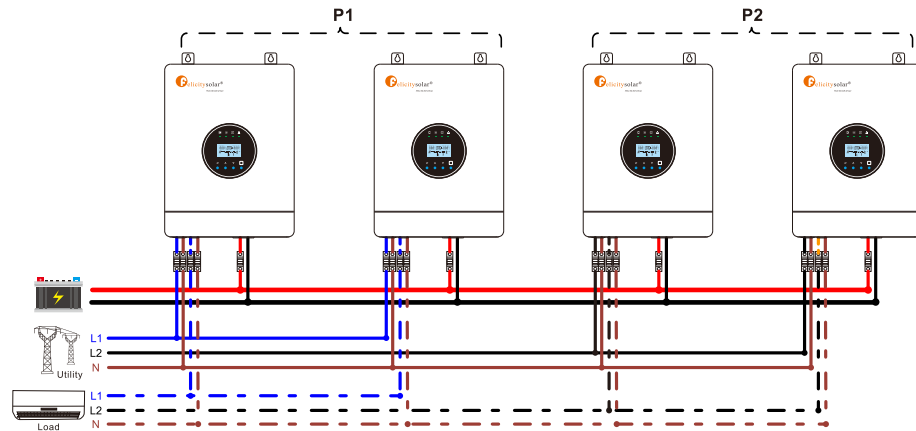


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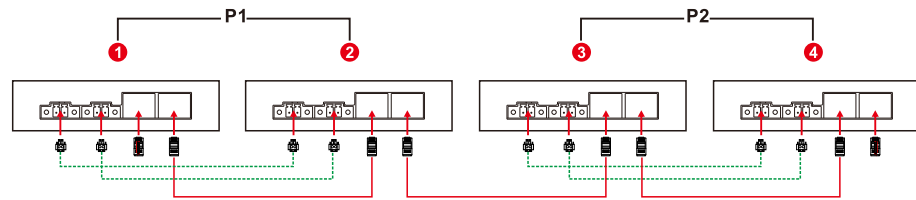
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Two inverters in each phase:

Power Connection



Communication Connection

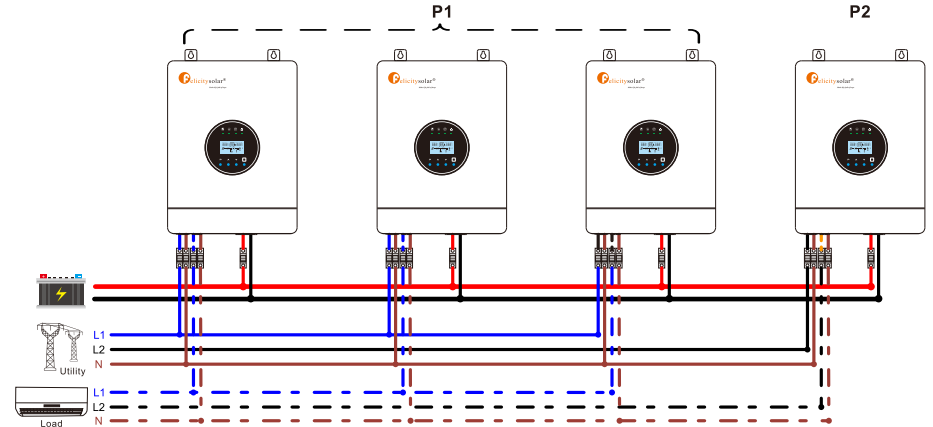


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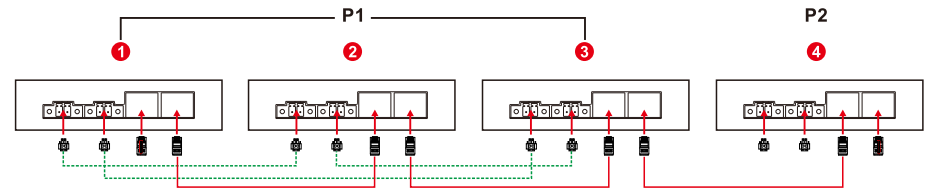
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Three inverters in one phase, one inverter in second phase :

Power Connection



Communication Connection

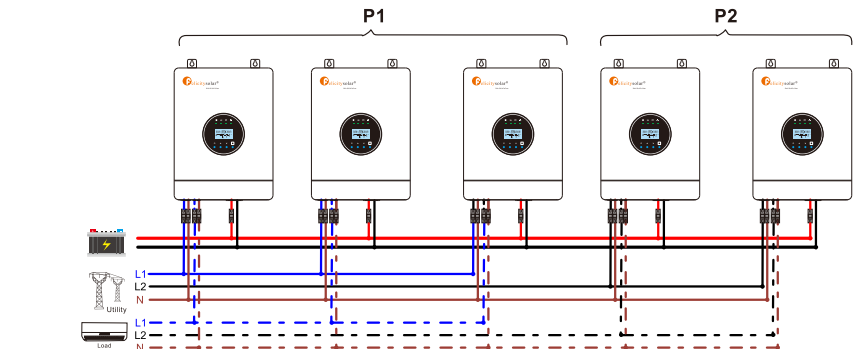


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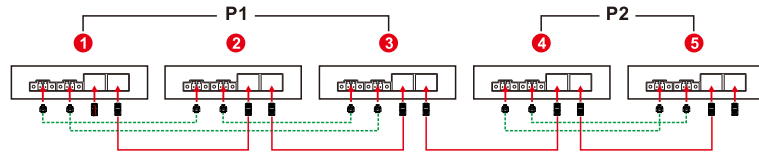
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.

Three inverters in one phase, two inverters in second phase :

Power Connection



Communication Connection

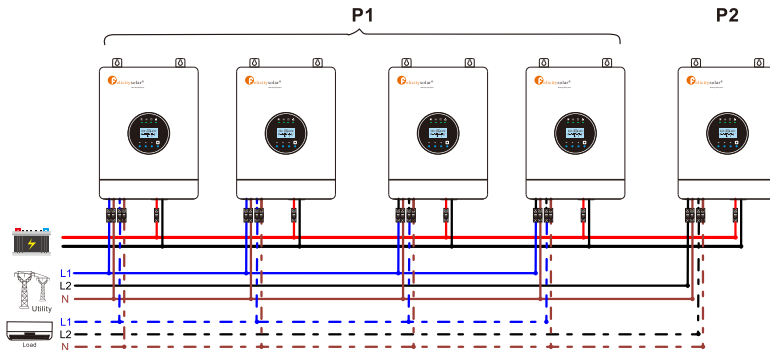


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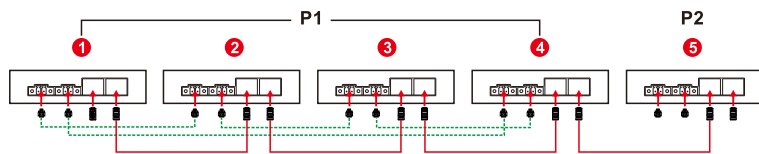
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Four inverters in one phase, one inverter in second phase:

Power Connection



Communication Connection

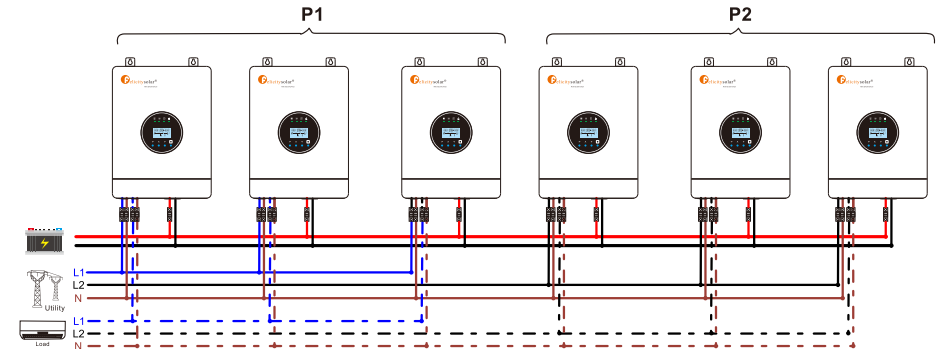


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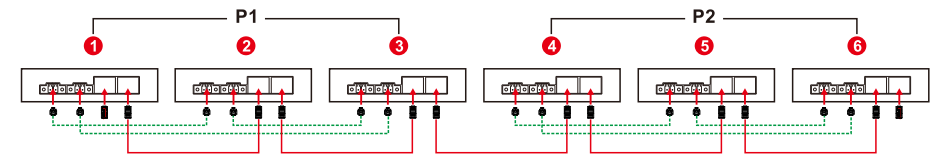
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Three inverters in each phase:

Power Connection



Communication Connection

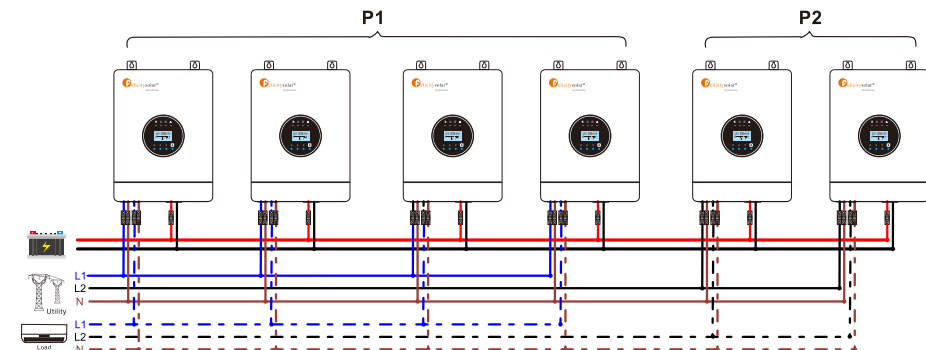


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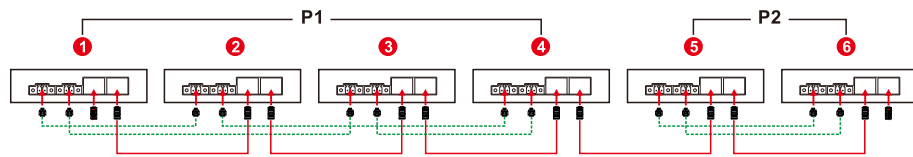
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Four inverters in one phase, two inverters in second phase :

Power Connection



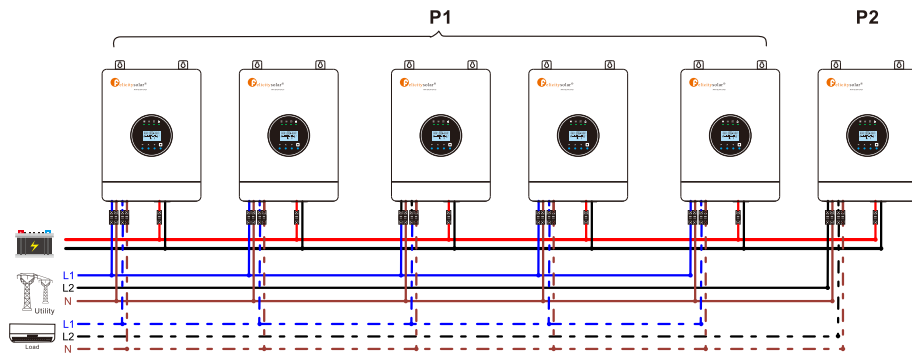
Communication Connection

**WARNING:**

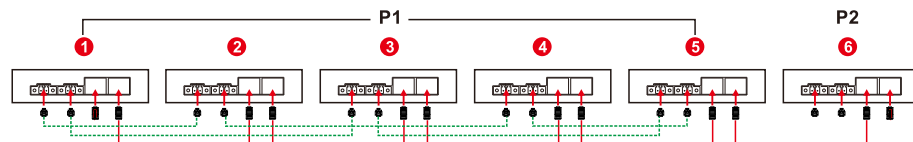
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

Five inverters in one phase, one inverter in second phase :

Power Connection



Communication Connection

**WARNING:**

1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire

5. PV CONNECTION

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

CAUTION: Each inverter should connect to PV modules separately

6. LCD SETTING AND DISPLAY

Setting Program:

Program	Description	Selectable option	
28	AC output mode *This setting is only available when the inverter is in standby mode (Switch off).	28 OUTPUT 510	When the units are used in parallel with single phase, please select "PAL" in program 28.
		28 OUTPUT PAL	It is required to have at least three inverters or maximum six inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase.
		28 OUTPUT 3P1	Please select "3P1" in program 28 for the inverters connected to L1 phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase.
		28 OUTPUT 3P2	It is required to have at least two inverters or maximum six inverters to support split-phase equipment. It's required to have at least one inverter in each phase or it's up to five inverters in one phase.
		28 OUTPUT 3P3	Please select "2P1" in program 28 for the inverters connected to L1 phase and "2P2" in program 28 for the inverters connected to L2 phase.
		28 OUTPUT 2P1	Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases. Besides, power saving function will be automatically disabled.
		28 OUTPUT 2P2	

7. COMMISSIONING

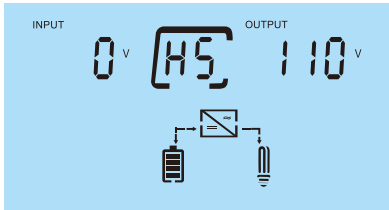
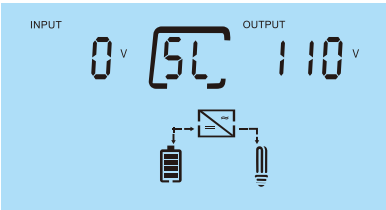
Parallel in single phase

Step 1: Check the following requirements before commissioning:

- Correct wire connection.
 - Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.
- Step 2: Turn on each unit and set "PAL" in LCD setting program 28 of each unit. And then shut down all units.

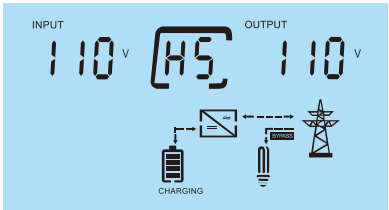
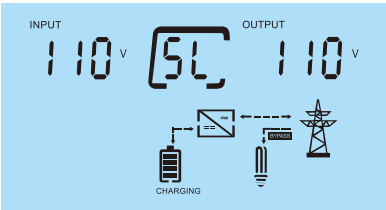
NOTE: To be safe, it's better to turn off switch when setting LCD program.

Step 3: Turn on each unit. If all inverters are configured correctly, one unit will show "HS" in LCD display, and others are "SL". Otherwise, please double check the procedure of Step1 and Step 2.


LCD display in Master unit	LCD display in Slave unit
	

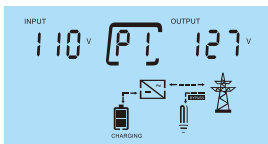
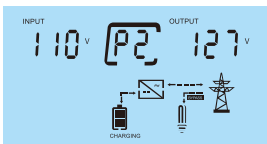
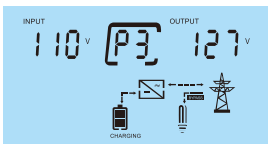
NOTE: Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It's better to have all inverters connect to utility at the same time. However, these inverters will automatically restart. If detecting AC connection, they will work normally.

LCD display in Master unit	LCD display in Slave unit
	

Support 3-phase equipment

Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally. Otherwise, the AC icon  will flash and they will not work in line mode.

LCD display in L1-phase unit	LCD display in L2-phase unit	LCD display in L3-phase unit
		

Step 5: If there is no more fault alarm, the system to support 3-phase equipment is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Note 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

Note 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.

Support split-phase equipment

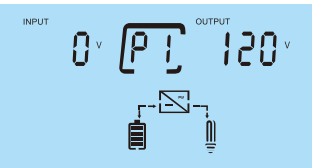
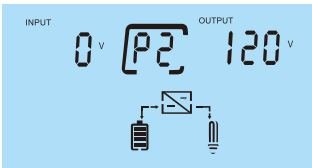
Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

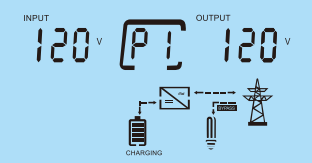
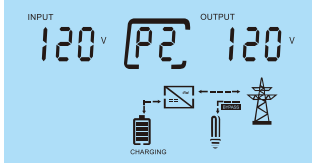
Step 2: Turn on all units and configure LCD program 28 as P1 and P2 sequentially. And then shut down all units.

NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting can not be programmed.

Step 3: Turn on all units sequentially.

LCD display in L1-phase unit	LCD display in L2-phase unit
	

Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and split phases are matched with unit setting, they will work normally.

LCD display in L1-phase unit	LCD display in L2-phase unit
	

Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

8. FAULT CODE TABLE

When fault event happens, inverter will cut off output, and the fault LED is solid on. At the same time, fault code, icon



and **ERROR** are shown on the LCD screen.

Fault Code	Fault information	Trouble Shooting
40	CAN data loss	1. Check if communication cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
41	Host data loss	
42	Synchronization data loss	
43	Current feedback into the inverter is detected.	1. Restart the inverter. 2. Check if L/N cables are not connected reversely in all inverters. 3. For parallel system in single phase, make sure the sharing cables are connected in all inverters. For supporting three-phase system, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. 4. If the problem remains, please contact your installer.
44	The firmware version of each inverter is not the same.	1. Update all inverter firmware to the same version. 2. Check the version of each inverter via LCD setting and make sure the CPU versions are same. If not, please contact your installer to provide the firmware to update. 3. After updating, if the problem still remains, please contact your installer.
45	The output current of each inverter is different.	1. Check if sharing cables are connected well and restart the inverter. 2. If the problem remains, please contact your installer.
46	AC output mode setting is different.	1. Switch off the inverter and check LCD setting program 28. 2. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on program 28. For supporting three-phase system, make sure no "PAL" is set on program 28. 3. If the problem remains, please contact your installer.