

Solar inverter

PARALLEL GUIDE

Solar Inverter
IVBM Series(8KVA~10KVA)



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1. INTRODUCTION

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

1.Parallel operation in single phase with up to 6 units.

The supported maximum output power of 8KVA model is 48KW/48KVA.

The supported maximum output power of 10KVA model is 60KW/60KVA.

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

The supported maximum output power of 8KVA model is 48KW/48KVA and one phase can be up to 32KW/32KVA.

The supported maximum output power of 10KVA model is 60KW/60KVA and one phase can be up to 40KW/40KVA.

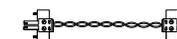
NOTE 1: Under parallel operation modes, battery must be connected with inverters.

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

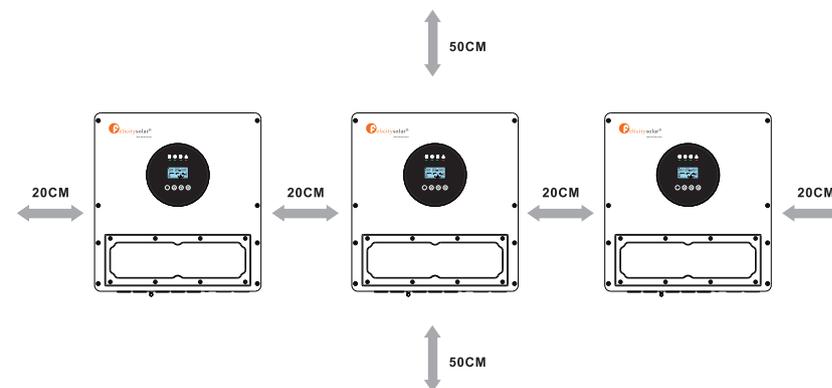
In parallel kit, you will find the following items in the package:



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.

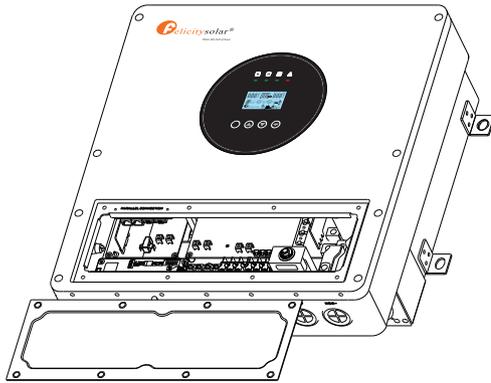


NOTE:

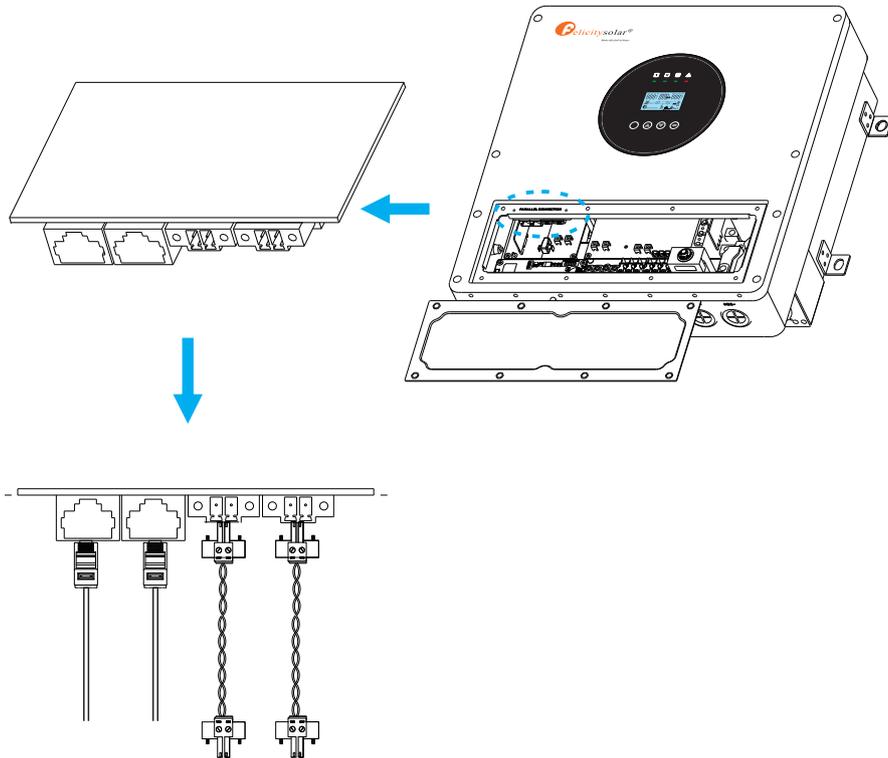
- For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.
- It is recommended that the parallel gap be 20cm. If the parallel gap is larger than 20cm, consult the technical personnel of the manufacturer

4. WIRING CONNECTION

This installation steps are applied to IVBM8048P1G1 and IVBM10048P1G1 model.
Step 1: Remove the wiring cover plate by unscrewing the screws of the small cover.



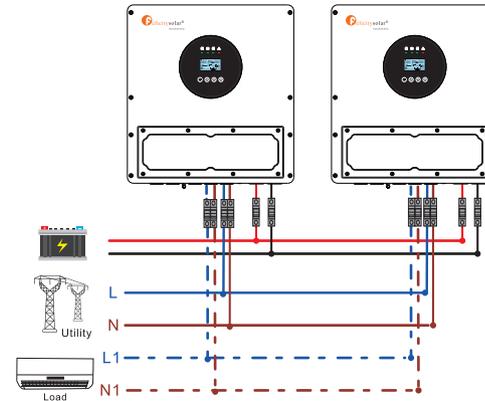
Step 2: Communication Connection



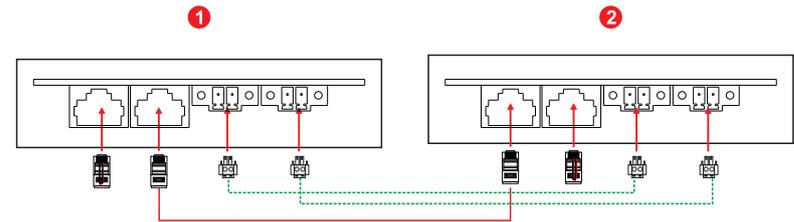
4.1 Parallel Operation in Single phase

Two inverters in parallel:

Power Connection



Communication Connection

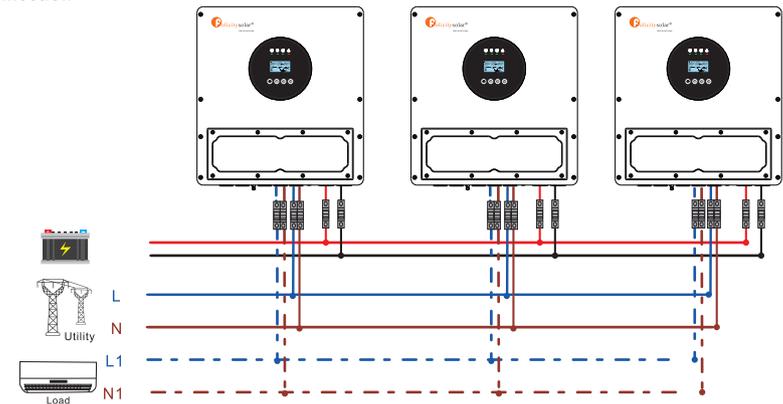


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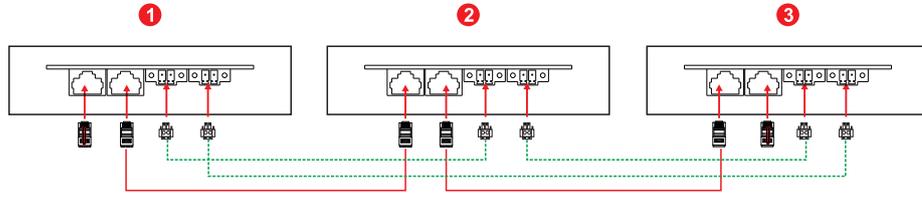
1. Before starting up inverters, please connect all negative (-) wires of battery together.
2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.
3. The Generator input or Smart load output cannot be used during parallel operation.

Three inverters in parallel:

Power Connection



Communication Connection

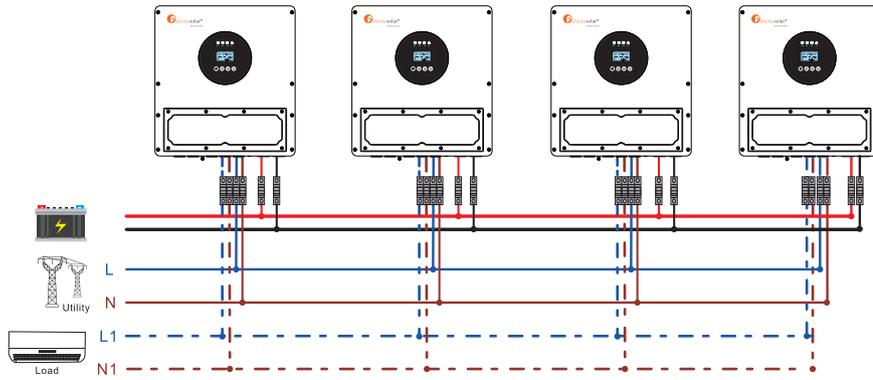


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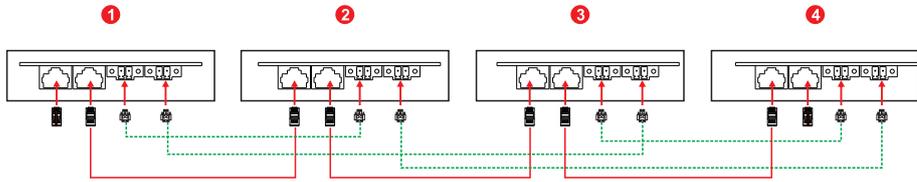
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Four inverters in parallel:

Power Connection



Communication Connection

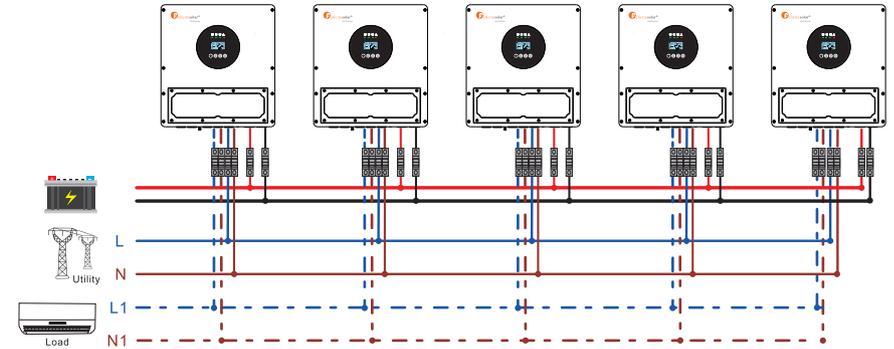


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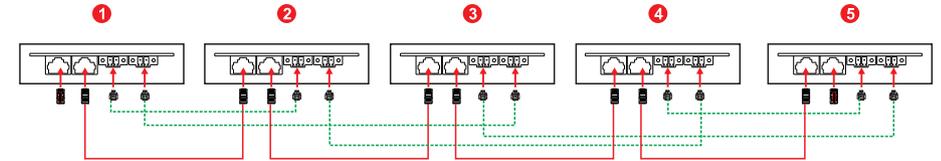
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Five inverters in parallel:

Power Connection



Communication Connection

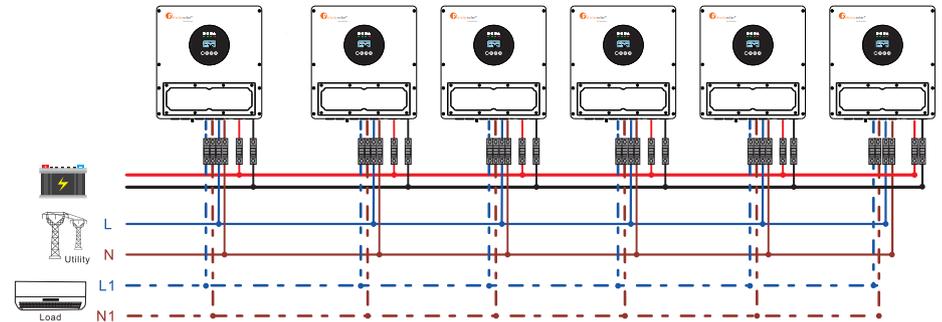


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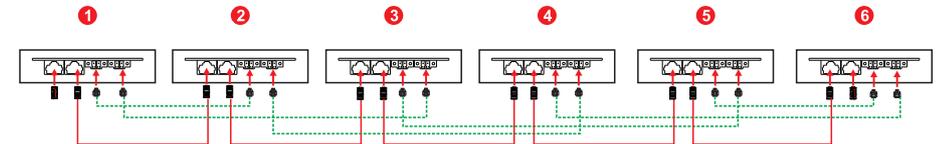
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2. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire.
3. The Generator input or Smart load output cannot be used during parallel operation.

Six inverters in parallel:

Power Connection



Communication Connection

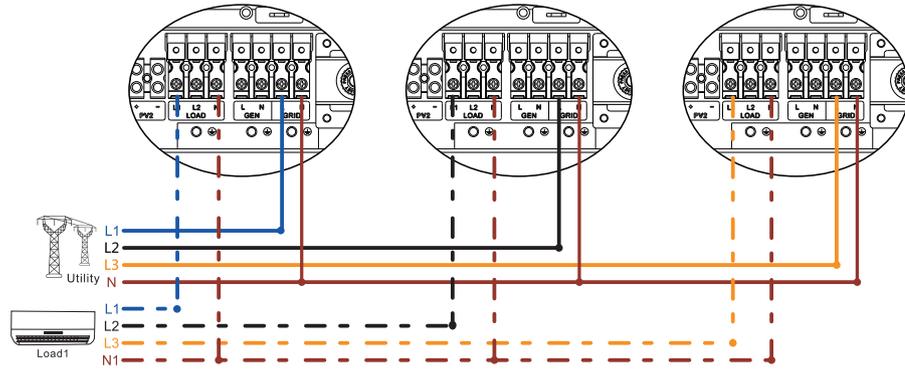


WARNING:

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.
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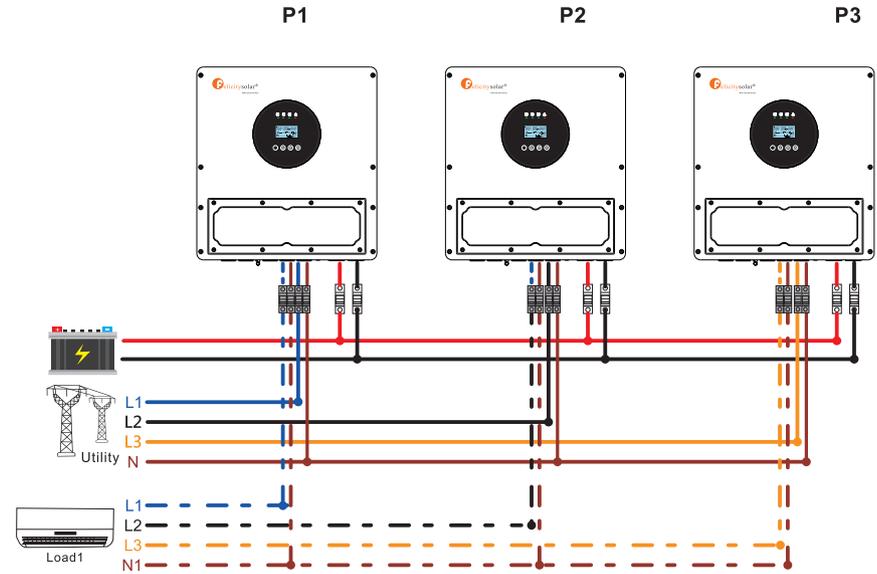
4.2 Support 3-phase equipment

Internal wiring diagram

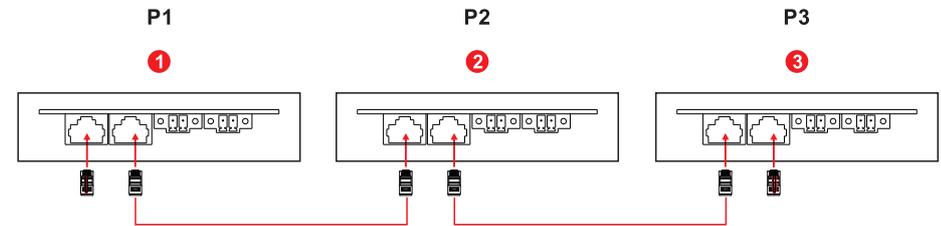


One inverter in each phase:

Power Connection



Communication Connection



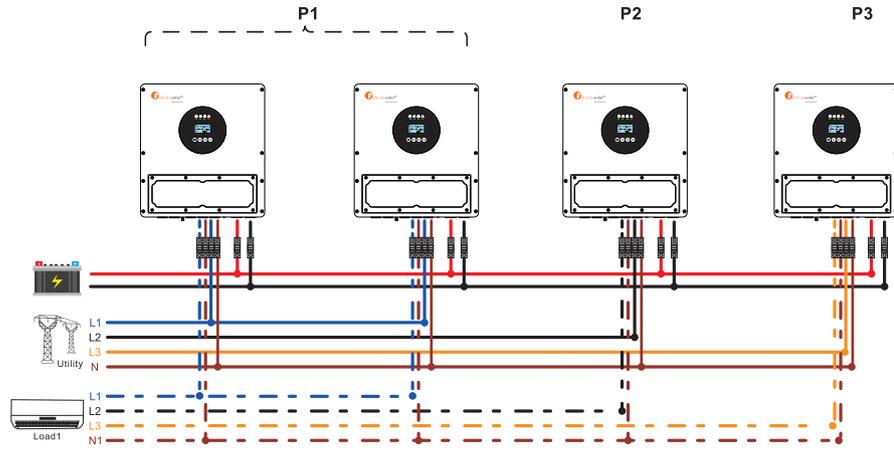
WARNING:

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
4. The Generator input or Smart load output cannot be used during parallel operation.

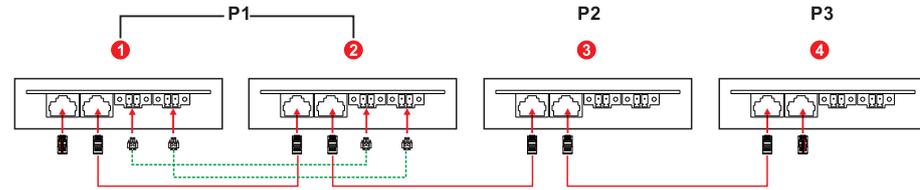
Note: P1: L1-phase, P2: L2-phase, P3: L3-phase.

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

Power Connection



Communication Connection

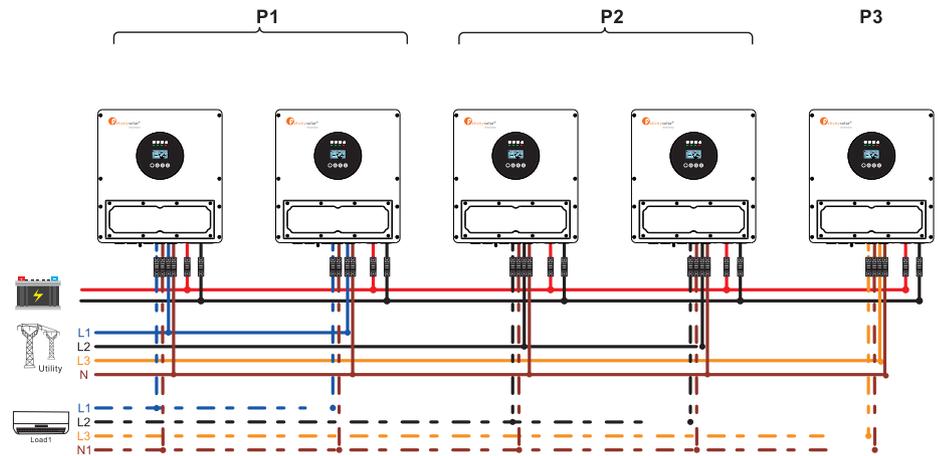


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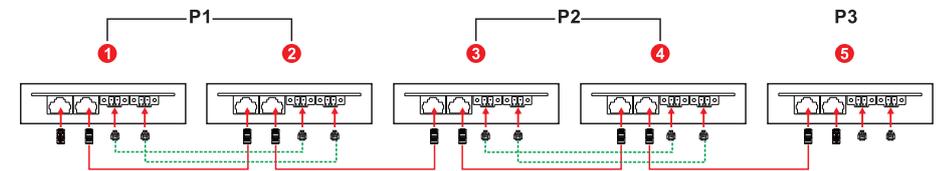
1. Before starting up inverters, please connect all negative(-) wires of battery together.
2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire
4. The Generator input or Smart load output cannot be used during parallel operation.

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

Power Connection



Communication Connection

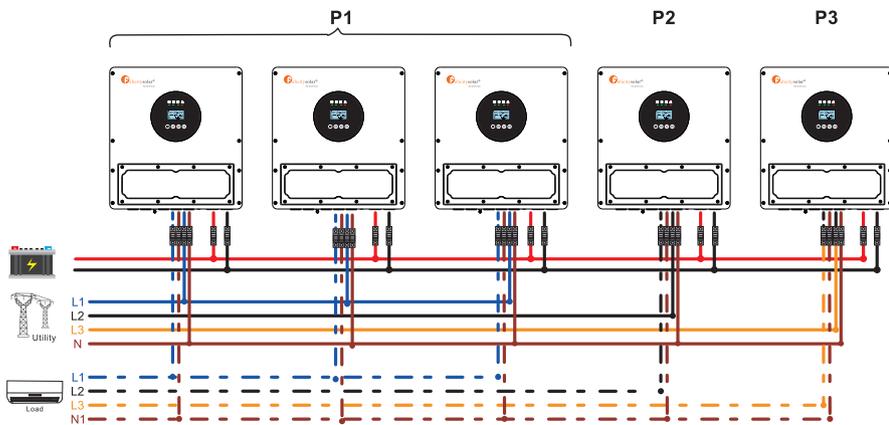


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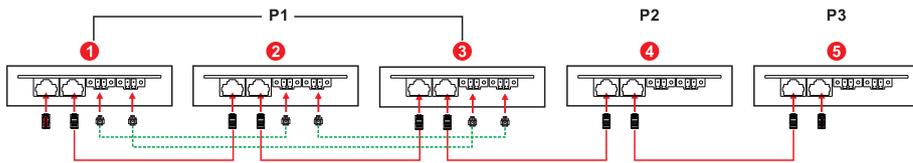
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2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire
4. The Generator input or Smart load output cannot be used during parallel operation.

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

Power Connection



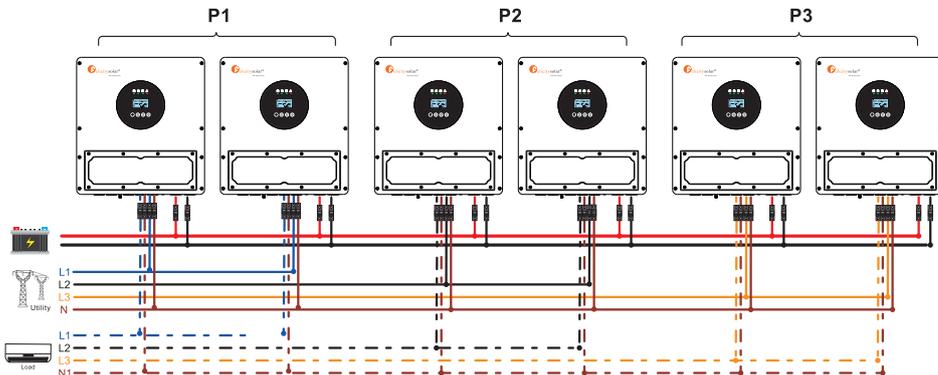
Communication Connection



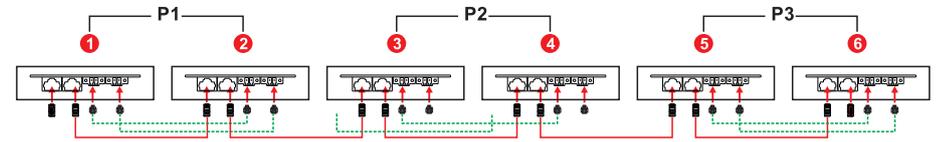
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 4. The Generator input or Smart load output cannot be used during parallel operation.

Two inverters in each phase:

Power Connection



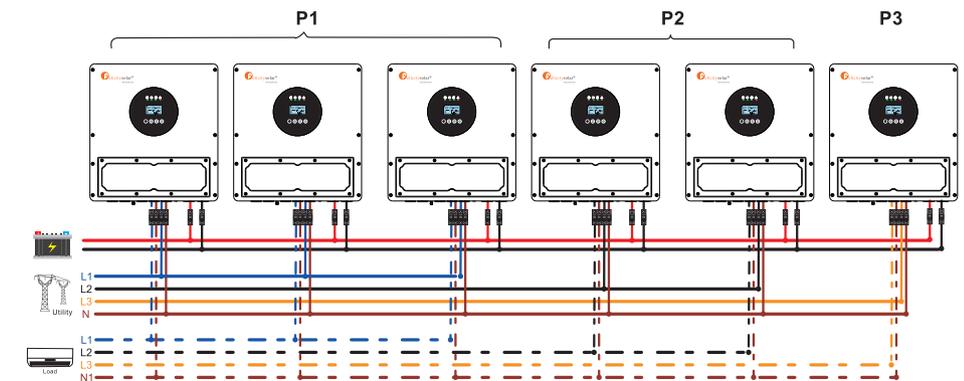
Communication Connection



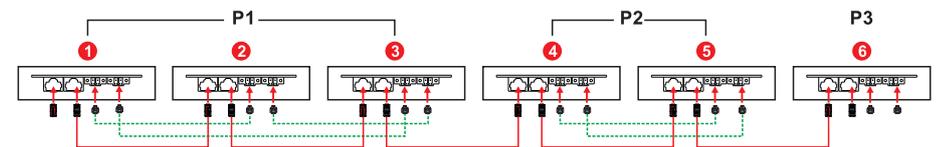
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 2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
 3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire
 4. The Generator input or Smart load output cannot be used during parallel operation.

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

Power Connection



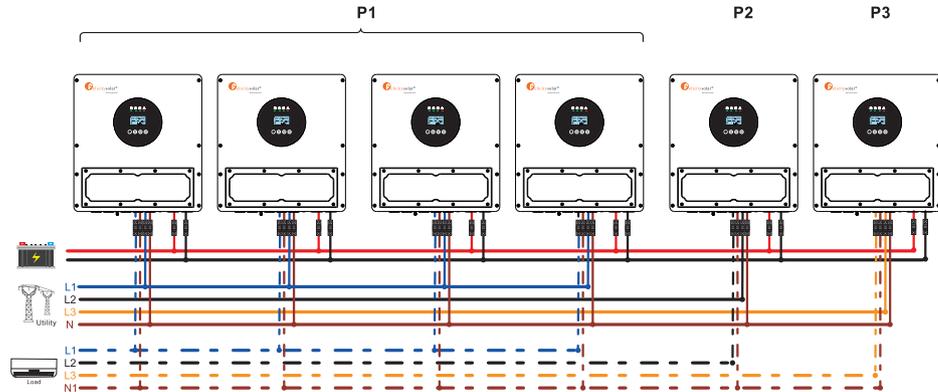
Communication Connection



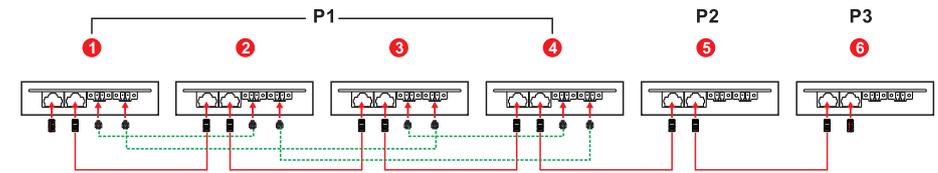
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 2. Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.
 3. Do not connect the AC input Neutral (N) wire to the AC output Neutral (N) wire
 4. The Generator input or Smart load output cannot be used during parallel operation.

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. The Generator input or Smart load output cannot be used during parallel operation.

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:

28	AC output mode	Single 	<p>When the units are used in parallel with single phase, please select "PAL" in program 28.</p> <p>It is required to have at least 3 inverters or maximum six inverters to support three-phase equipment.</p> <p>It's required to have at least one inverter in each phase or it's up to four inverters in one phase.</p> <p>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.</p> <p>Do NOT connect share current cable between units on different phases.</p> <p>Before starting up inverters, please connect all N wires of AC output together.</p>
		Paralle 	
		L1 Phase 	
		L2 Phase 	
		L3 Phase 	

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

Parallel in three 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 all units and configure LCD program 28 as P1, P2 and P3 sequentially. 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 all units sequentially.

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

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.

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	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.
43	Current feedback into the inverter is detected.	
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.