

QUICK INSTALLATION GUIDE

THREE-PHASE ESS INVERTER

12K/15K/20K/25K/30K



About this Manual

Read through this manual prior to installing or operating the product.

Scope

This manual applies to the inverters listed below:

- 12KHB-D3
- 15KHB-D3
- 20KHB-D3
- 25KHB-T3
- 30KHB-T3

Statement

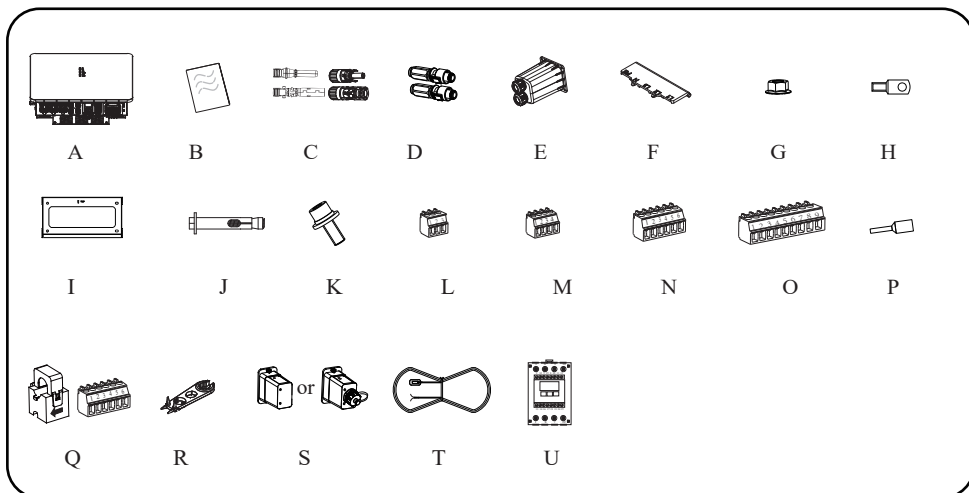
All information here takes model 30KHB-T3 as reference and guidance only. The appearance may vary in different models, the actual product shall prevail. Contents including illustrations in this manual are subject to change without notice.

Conventions

The following safety instructions and general information are used within this manual.

	Indicates an imminently hazardous situation which, if not correctly followed, will result in serious injury or death.
	Indicates a potentially hazardous situation which, if not correctly followed, will result in serious injury or death.
	Indicates a potentially hazardous situation which, if not correctly followed, could result in moderate or minor injury.
	Indicates a potentially hazardous situation which, if not correctly followed, could result in equipment failure to run, or property damage.
 NOTE	Call attention to important information, best practices and tips: supplement additional safety instructions for your better use of the Three phase ESS inverter to reduce the waste of you resource.

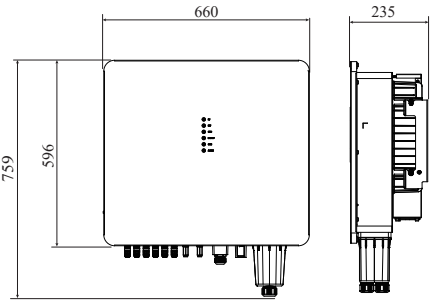
1 Packing List



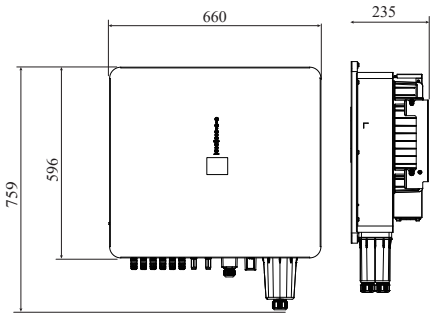
Number	Quantity	Description	Number	Quantity	Description
A	1	Inverter	J	4	M10 Expansion screw
B	1	File package	K	1	M6 Security screw
C	4 or 6	PV connector group (female + male connector of PV input wire)	L	1	3-Pin terminal
			M	3	4-Pin terminal
			N	1	6-Pin terminal
D	1 or 2	Battery connector group (positive + negative terminal of battery cable)	O	1	9-Pin terminal
			P	25	Pin terminal
			Q	1	CT pack (3pcs CT + 1pcs 6-pin terminal)
E	1	AC waterproof cover	R	1	Tightening/Removal tool for PV connector
F	1	Insulation board for AC terminal	S	1	WIFI/LAN module (Optional)
G	11	M5 Screw cap (for AC cable locking)	T	1	Battery temperature sensor (NTC optional)
H	11	OT terminal	U	1	Meter (Optional)
I	1	Mounting bracket			

2 Specification and Location

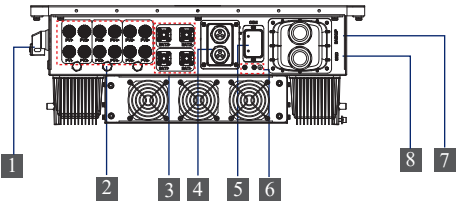
Specification



Type1: Inverter with LED



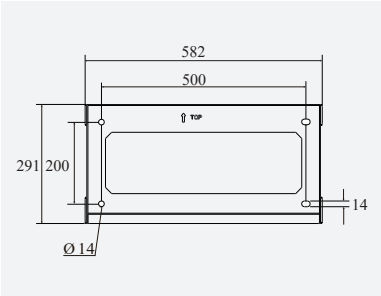
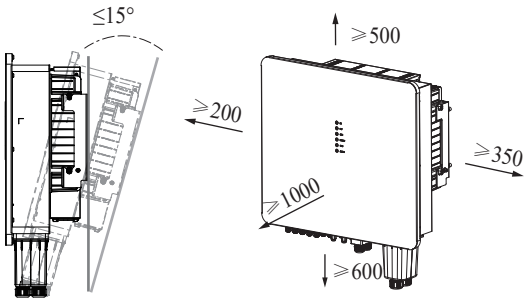
Type2: Inverter with LED and LCD



The Bottom View of ESS Inverter

No.	Description
1	PV switch
2	PV Input Terminals
3	Battery Connect Terminals
4	COM1 Ports (RS485, BMS, DRMs/RCR, CT, NTC/DI/DO, RSD/RMO, PARAL)
5	COM Port (WIFI/LAN)
6	Grounding Terminals
7	BACKUP Output Terminal
8	GRID Output Terminal

Location



Unit: mm

3 Installation

	- The installation walls must be fireproof and non-flammable materials, otherwise there is a fire risk. - Before drilling holes, check whether there are electric power pipes or other pipes buried in the walls to avoid risks.
	The inverter is heavy! To avoid device damage and personnel injury, at least two people are recommended to move the inverter and handle with care.

1 Mark the holes position on the wall.

2 Drill the holes.

3 Expansion bolts (M10; 4 sets)

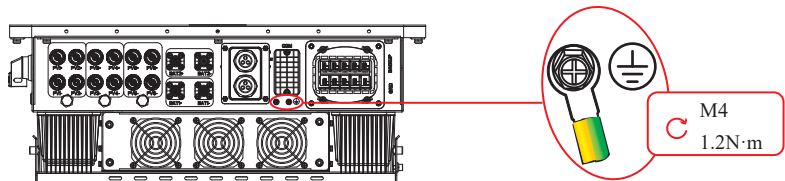
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4 Grounding

	Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, high voltage may result in fatal injury.
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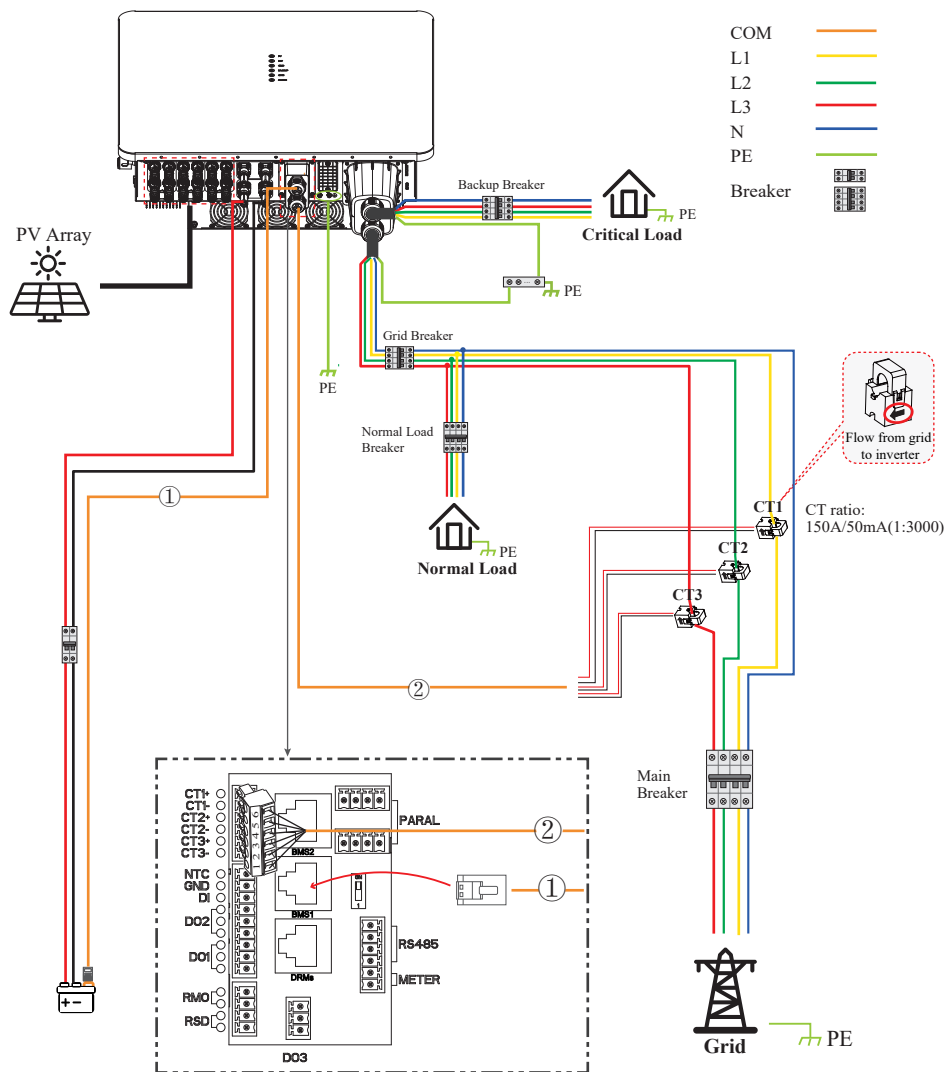


Items	Remark
Screw	M4 X 12mm; 1.2 N·m
OT terminal	OT14-4
Green-yellow wire	$S \text{ (green-yellow wire)} \geq S \text{ (PE wire in AC cable)}$ S is the cross-sectional area. OT terminal must be sized to cross-sectional area of green-yellow wire.

5 Non-Parallel Connection Wiring Diagram



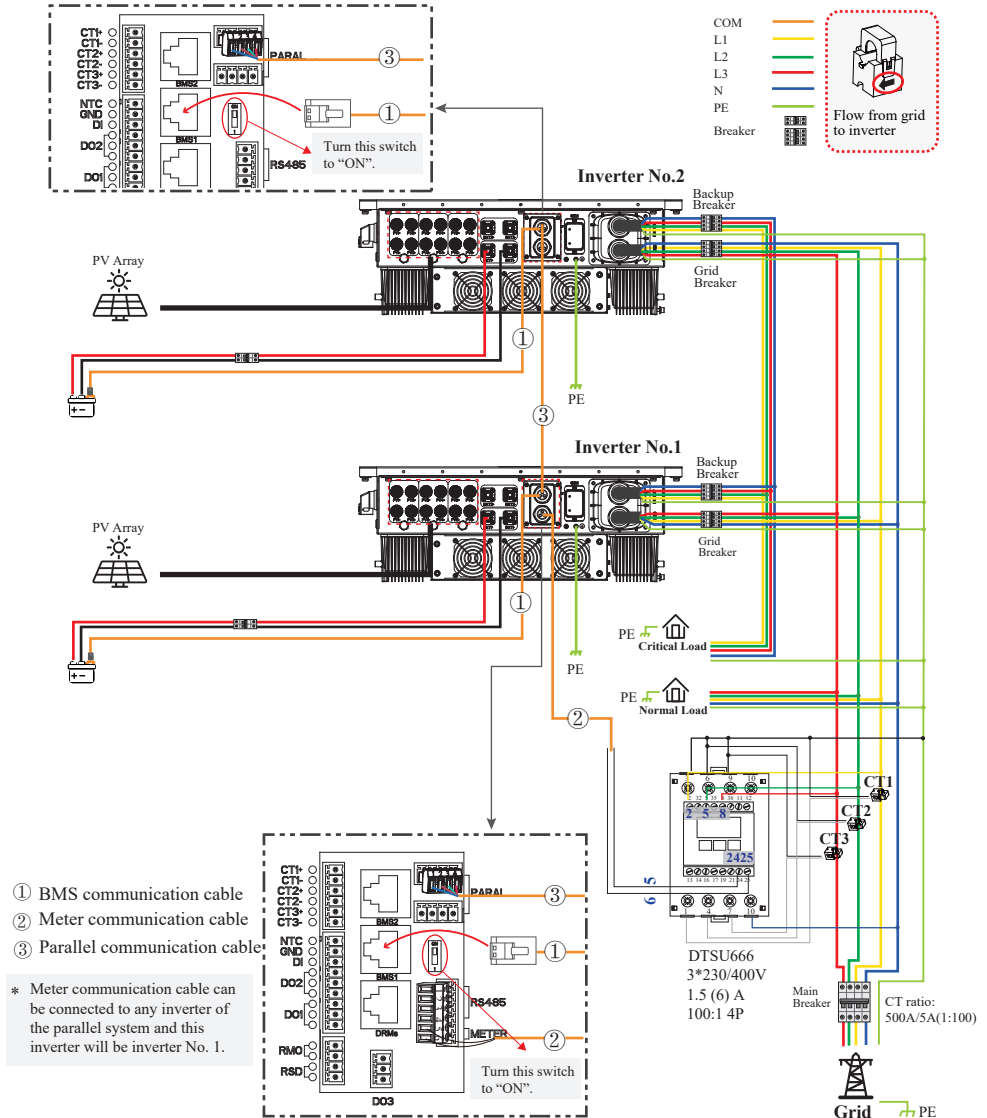
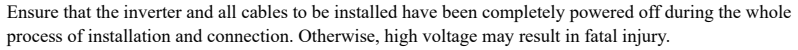
Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, high voltage may result in fatal injury.



Note

1. BMS communication connection is applicable to lithium battery.
2. The external DC/AC breakers are not supplied with the inverter and must be purchased separately. The specifications of main breaker and normal load breaker depend on household loads. For other breakers, please refer to the **Breaker Recommendation Table** of section 7.

6 Parallel Connection Wiring Diagram-Scheme A (N=2)



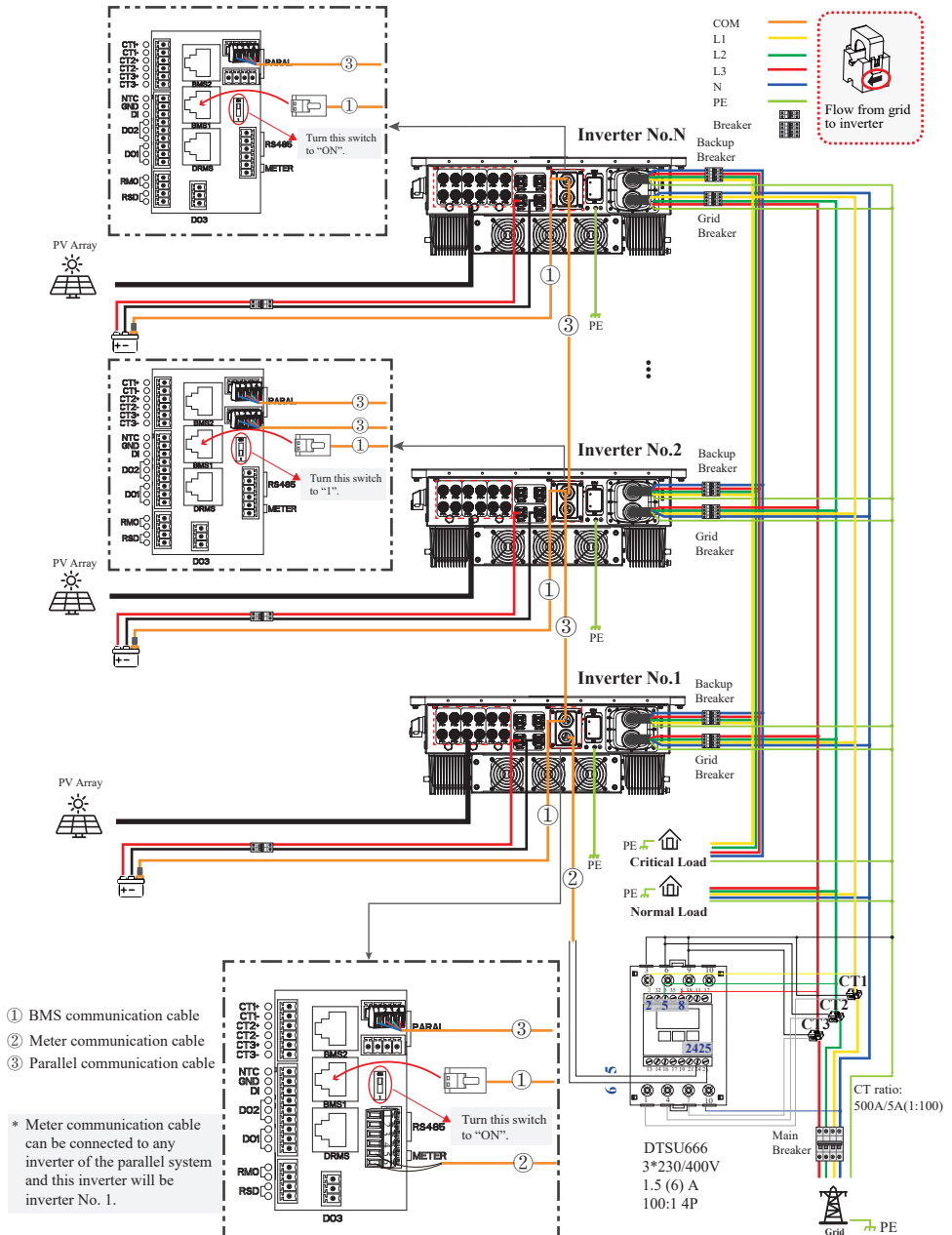
Note

1. BMS communication connection is applicable to lithium battery.
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7 Parallel Connection Wiring Diagram-Scheme B ($3 \leq N \leq 10$)



Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, high voltage may result in fatal injury.



Note:

1. BMS communication connection is only for lithium battery.
2. The arrow on the CT indicates the current flow from grid to inverter. The current direction from grid to inverter is defined as positive and current direction from inverter to grid is defined as negative. L1, L2 and L3 only pass through the detection hole of CT1, CT2 and CT3 respectively.
3. It is necessary to turn the matched resistance switch of No. 1 inverter and No. N inverter to “ON” and turn others to “1” in parallel connection mode. **(Only for Scheme B)**
4. With parallel connection mode, it is necessary to connect APP to one of inverters and then go to [Console >Hybrid Setting> Other >Parallel mode](#) page to enable [Parallel mode](#) on APP. Setting/modifying the parameter requires logging into an administrator account.
5. The external DC/AC breakers are not supplied with the inverter and must be purchased separately. The specifications of main breaker and normal load breaker depend on household loads. For other breakers, please refer to the table below.

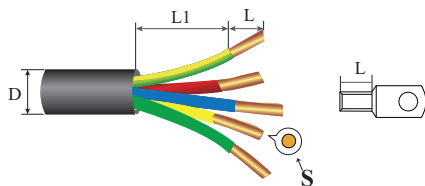
Breaker Recommendation Table

Inverter	Battery Breaker	Backup Breaker	Grid Breaker
12KHB-D3	≥80A	≥63A	≥63A
15KHB-D3		≥63A	≥63A
20KHB-D3		≥63A	≥63A
25KHB-T3	≥160A*1 (Single battery connected to both BAT1 and BAT2);	≥80A	≥80A
30KHB-T3	≥80A*2 (Battery systems connected to BAT1 and BAT2 respectively)	≥80A	≥80A

8 GRID/BACKUP Connection



- Before connecting the GRID/BACKUP terminal, ensure that both the AC terminal and the DC terminal are powered OFF and the PV switch is OFF. Otherwise there is a risk of high voltage shock.
- Never touch BACK-UP port when the inverter is powered on since there is AC output. Power off the inverter first if maintenance is required for the loads connected to BACK-UP ports. Otherwise, electric shock may occur.
- Be aware of the danger of electric shock! When the power grid is connected and the inverter is turned on, even if the Backup Output option is disabled, the Backup port of the inverter still has AC power.



D (Diameter): 22 ~ 27mm

S (Cross sectional area): 13 ~ 16 mm²

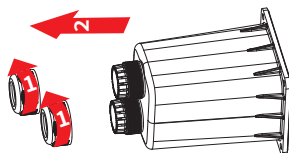
L (Length): 12±1mm

L1: 70~80 mm

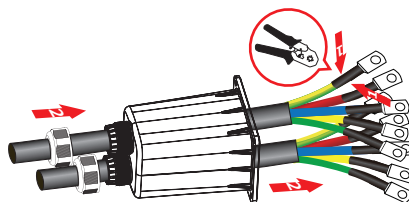
Note:

It is recommended to use outdoor dedicated cables with multiple copper cores.

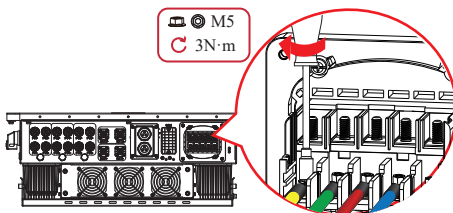
1



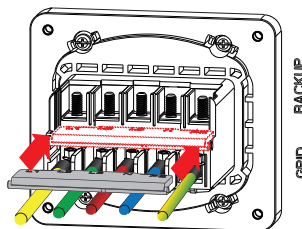
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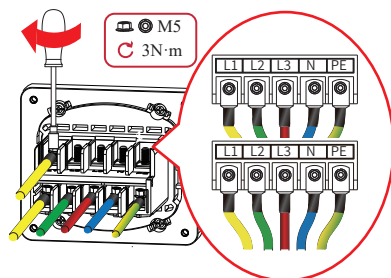
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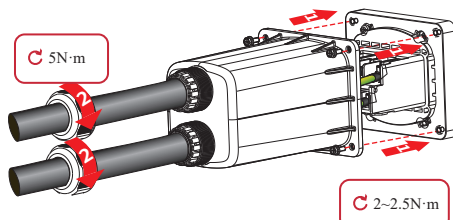
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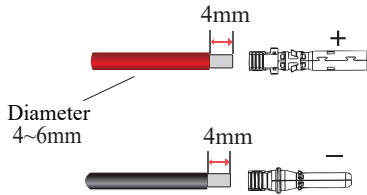


7

9 PV Connection

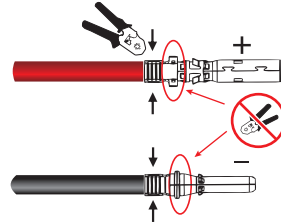


- Photovoltaic arrays exposed to sunlight will generate dangerous voltages!
- Before connecting the PV terminal, ensure that both the AC terminal and the DC terminal are powered OFF and the PV switch is OFF. Otherwise there is a risk of high voltage shock.

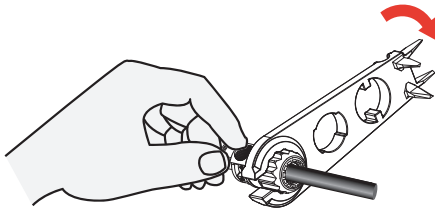


Note:
PV cable should be dedicated PV cable
(suggest using 4~6mm² PV1-F cable).

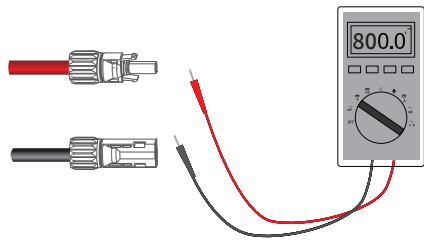
1 Wires making.



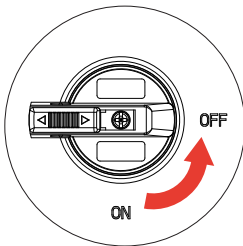
2



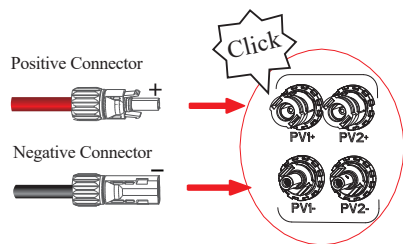
3 Tighten the waterproof nuts.



4 Test string voltage and confirm string polarity.



5 Ensure that the PV switch is OFF.



6 Insert the positive and negative connectors into the PV+/PV- ports until a "click" sound is heard.

10 Battery Connection

	Before connecting the Battery terminal, ensure that both the AC terminal and the DC terminal are powered OFF and the PV switch is OFF. Otherwise there is a risk of high voltage shock.
	- For 12KHB-D3 / 15KHB-D3 / 20KHB-D3, please connect the cable to BMS1 port. Otherwise, BMS communication may fail. - For 25KHB-T3 / 30KHB-T3, when single battery system is connected to both BAT1 and BAT2, please connect the cable to BMS1 port to realize BMS communication. Otherwise, BMS communication may fail. - For 25KHB-T3 / 30KHB-T3, When battery systems connected to BAT1 and BAT2 of the inverter respectively, please connect the BAT1 communication cable to BMS1 and BAT2 communication cable to BMS2 port correspondingly to realize BMS communication. Otherwise, BMS communication may fail.
	NOTE 12K/15K/20KHB-D3:support BAT1 only; 25K/30KHB-T3: support BAT1 and BAT2.

1

Cable Type Specification (recommendation)	Battery
Diameter(D)	10 ^{+0.5} _{-0.3} mm
Cross section(S)	25mm ²
Strip length (L)	~10mm
Cable total length	≤3m

Note: Cables mentioned above must be sized to the connectors.

2

3

Hydraulic Pressure Crimper

4

DC Breaker ≥ 80A

Note:
This inverter is not equipped with DC breakers.

5

BAT+ Red Cable
BAT- Black Cable

Warning!
Reverse polarity will damage the inverter!

Since there are two groups of battery connect terminals, for 25KHB-T3 / 30KHB-T3, it is necessary to set battery connection type on APP and make sure that the connection methods of power port and BMS port are correct before powering on the inverter by following the table below.

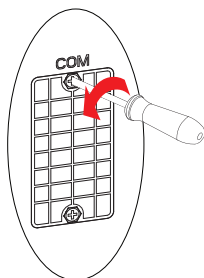
Battery connection type	Description	Power port		BMS port	
		BAT1+/-	BAT2+/-	BMS1	BMS2
Single Battery (BAT1)	Single battery system connected to BAT1 only	✓		✓	
Single Battery (BAT2)	Single battery system connected to BAT2 only		✓		✓
Two Separate Battery (BAT1, BAT2)	Battery systems connected to BAT1 and BAT2 respectively	✓	✓	✓	✓
Single Battery (BAT1+BAT2)	Single battery system connected to both BAT1 and BAT2	✓	✓	✓	

11 WIFI/LAN Module Installation (Optional)

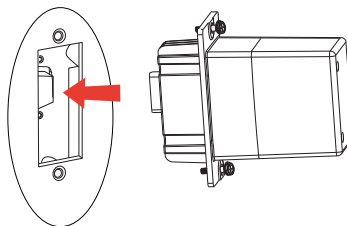


NOTE

For details, please refer to the corresponding Module Installation Guide in the packing.
The appearance of modules may be slightly different. The figure shown here is only for illustration.

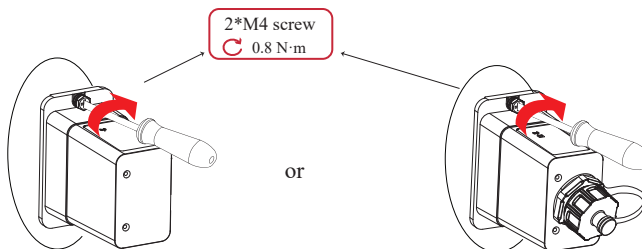


1 Unscrew and remove the cover.



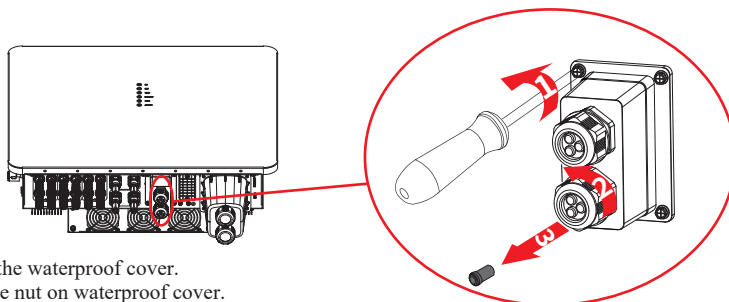
2 Insert WiFi / LAN module into the port firmly.

Note:
Proper strength to avoid damage to the module.



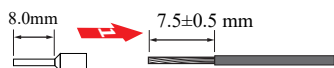
3 Secure the module.

12 Communication Cable(s) Connection (PARAL/CT/BMS/RS485)

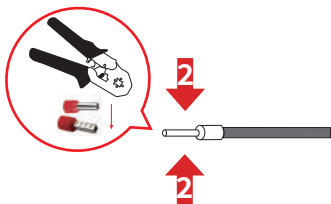


1

PIN-terminal

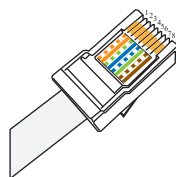


Note:
The recommended wire size: 0.2~0.5mm².

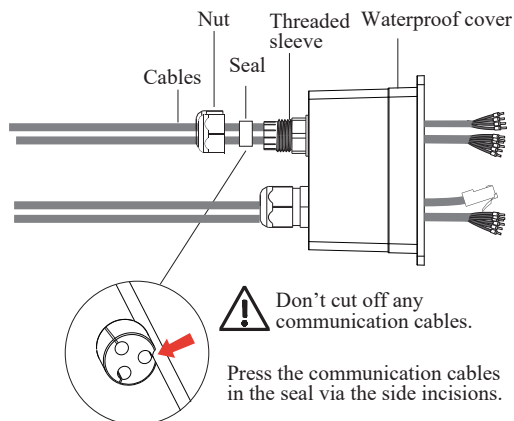


2 Wires crimping.

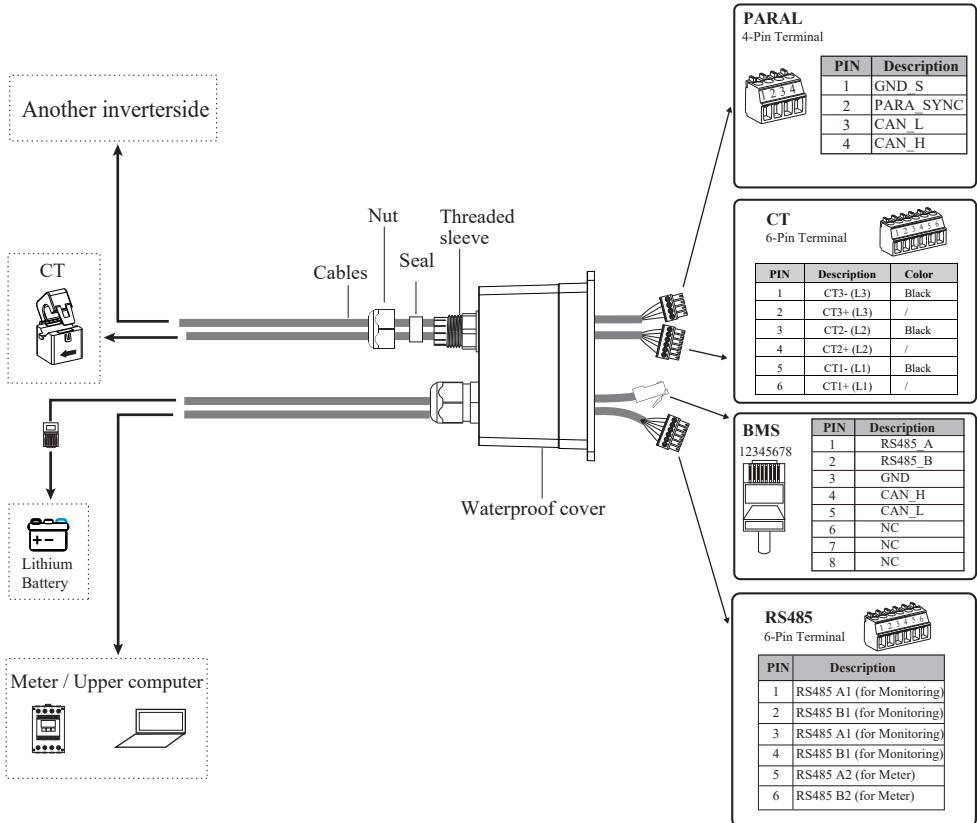
RJ45-terminal



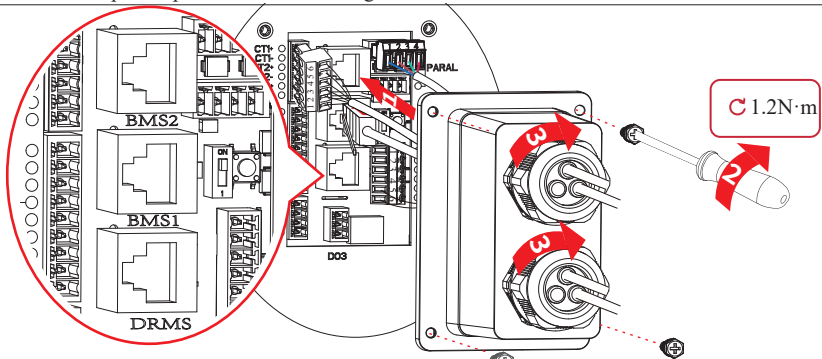
Pin	Color	Pin	Color
1	White-orange	5	White-blue
2	Orange	6	Green
3	White-green	7	White-brown
4	Blue	8	Brown



3 Thread the communication cable(s) through the nut, seal and waterproof cover in turn.



4 Assembly the RJ45/ 4-pin / 6-pin terminals according to each Pin definition as needed.



5

13 Startup/Shutdown Procedure

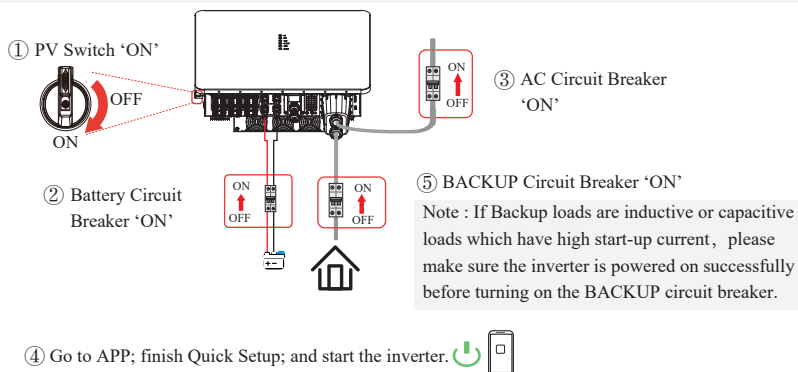


After the inverter is powered off, the remaining electricity and heat may still cause electric shock and body burns. If need to disconnect the inverter cables, please wait at least 10 minutes before touching these parts of inverter.

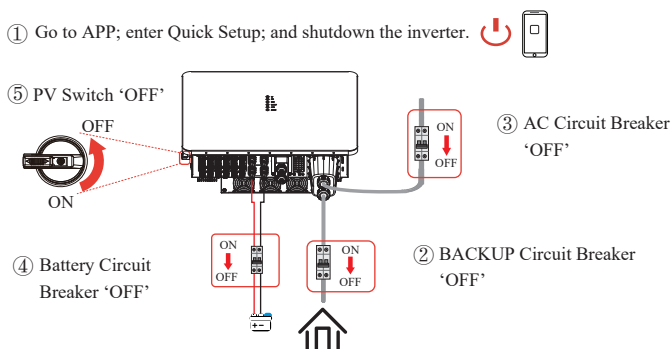
Inspection

No.	Items
1	The inverter is firmly installed.
2	There is enough heat dissipation space, no external objects or parts left on the inverter.
3	It is convenient for operation and maintenance.
4	The wiring of the system is correct and firm.
5	Check whether the DC and AC connections are correct with a multimeter, and whether there is a short circuit, break, or wrong connection.
6	Check whether the waterproof nuts of each part are tightened.
7	The vacant ports have been sealed. All gaps at the cable inlet and outlet holes have been plugged with fireproof/waterproof materials, such as fireproof mud.
8	All safety labels and warning labels on the inverter are complete and without occlusion or alteration.

Startup Procedure



Shutdown Procedure



14 Display



PV



BAT



GRID



BACKUP



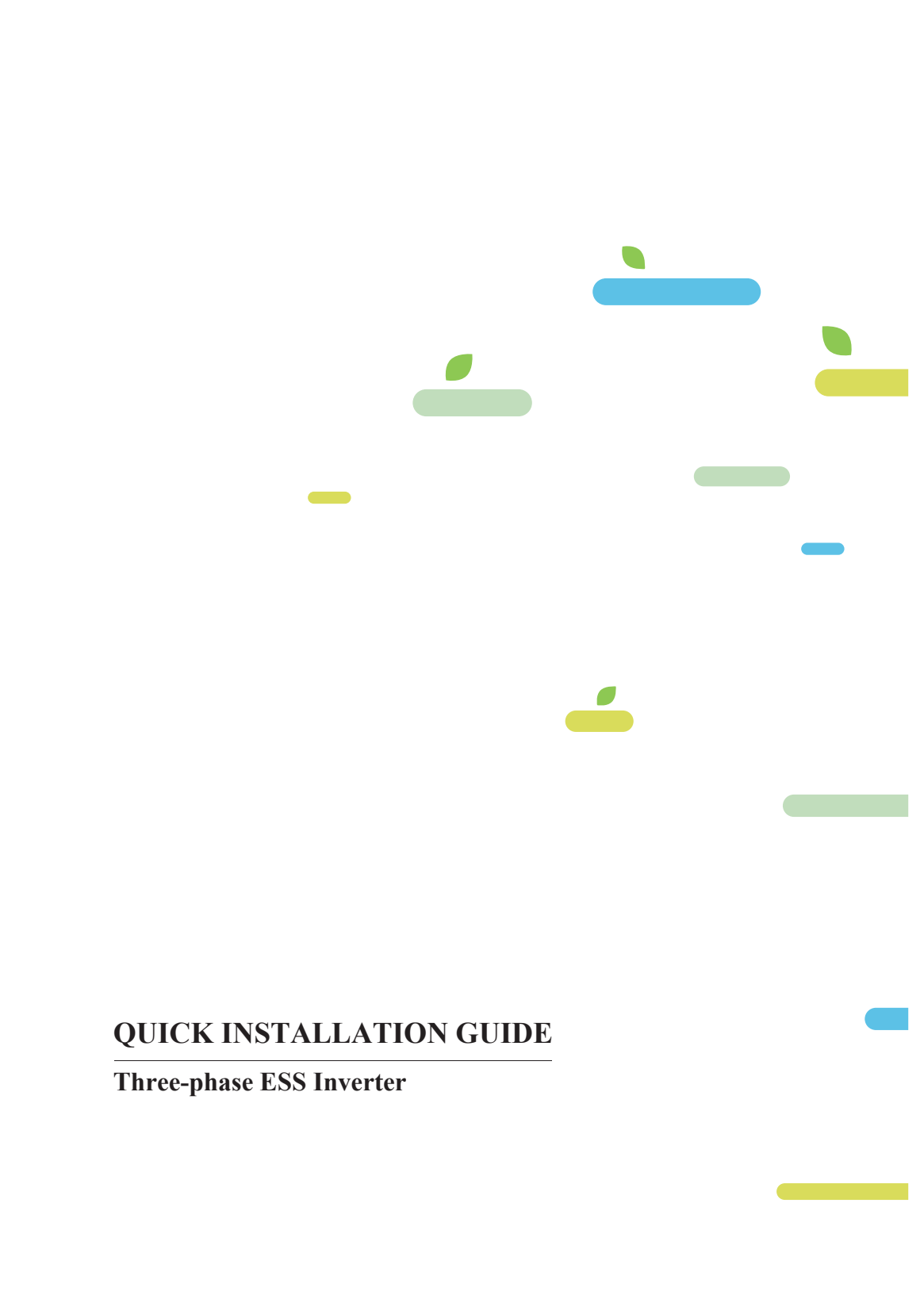
COM



ALARM

LED	Status	Description
PV	On	PV input is normal.
	Blink	PV input is abnormal.
	Off	PV is unavailable.
BAT	On	Battery is charging.
	Blink	Battery is discharging. Battery is abnormal.
	Off	Battery is unavailable.
GRID	On	GRID is available and normal.
	Blink	GRID is available but abnormal.
	Off	GRID is unavailable.
BACKUP	On	BACKUP power is available.
	Blink	BACKUP output is abnormal.
	Off	BACKUP power is unavailable.
COM	Blink	Data are communicating.
	Off	No data transmission.
ALARM	On	Fault has occurred and inverter shuts down.
	Blink	Alarms have occurred but inverter doesn't shut down.
	Off	No fault.

NOTE



QUICK INSTALLATION GUIDE

Three-phase ESS Inverter