

Figure 6-27 Hooking the inverter on the bracket

NOTICE!

- When the inverter is lifted up from the carton or the inverter is close to the mounting bracket, use hands to adjust the inverter position to prevent any damage to the inverter.
- Ladders will be helpful for installers to stand in a proper position and adjust the inverter position.

Step 5: Remove the eye bolts when the inverter is hooked on the mounting bracket and tighten the M10 screws with a flat-head screwdriver.

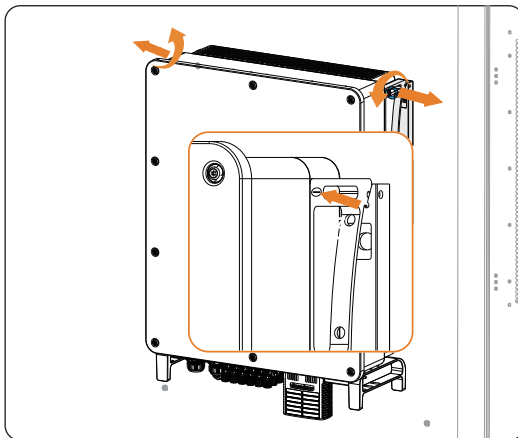


Figure 6-28 Removing the eye bolts

NOTICE!

- After removing the eye bolts from the inverter, keep them in a safe place. They are needed when the inverter is relocated or disassembled.

Step 6: Secure the inverter to the mounting bracket with M5 screws (Part B2). (Torque: 3 ± 0.3 N·m)

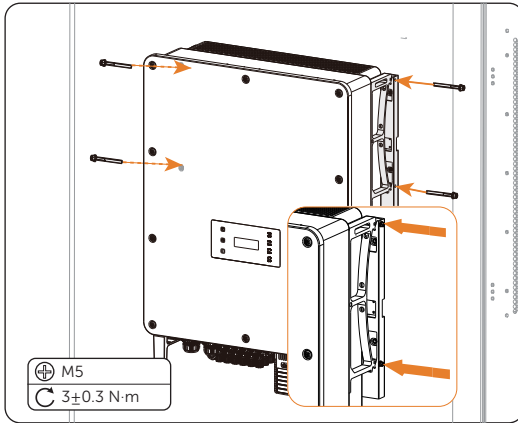


Figure 6-29 Securing the inverter

7 Electrical Connection

NOTICE!

- Before wiring, operators are required to learn which parts need to be conducted wiring. For details, please refer to Figure 7-1.

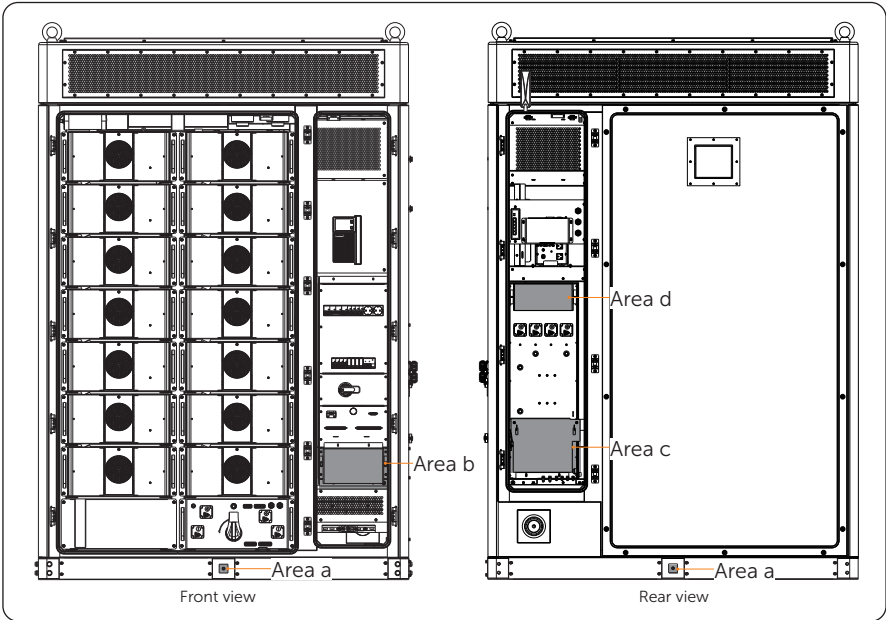


Figure 7-1 Wiring area

Table 7-1 Introduction of wiring area

Wiring area	Description
Area a	To connect grounding plate or PE wire.
Area b	To connect EPS wires.
Area c	To connect GRID wires.
Area d	To connect cables for parallel connection.

7.1 Cabinet Grounding Connection

The device supports grounding plate connection and PE connection. Either of them can be connected to the wiring area "Area a". Please strictly follow the steps below.

NOTICE!

- There are two GND ports on the cabinet. Either of them can be connected.
- The grounding plate or the PE wire is prepared by the user self. For details, please refer to "4.3 Additionally Required Materials".

Grounding Plate Connection

Step 1: Insert and tighten M12 screw (Part L) to secure grounding plate (torque: 42 ± 2 N·m).

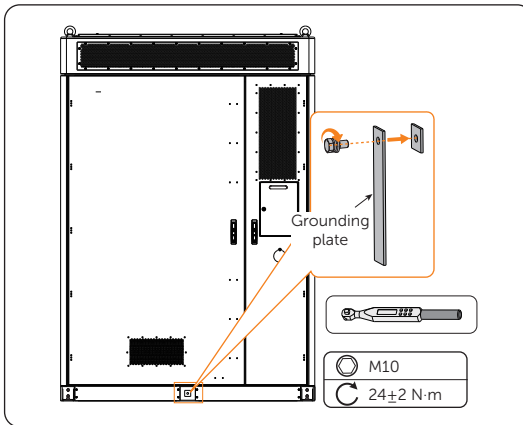


Figure 7-2 Tightening M12 screws

PE Connection

Step 1: Strip the cable jacket about 20 mm from the end.

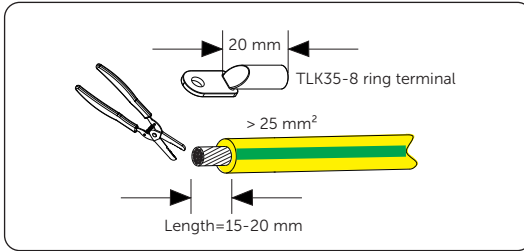


Figure 7-3 Stripping cable jacket

Step 2: Cut the heat-shrink tubing (Ø15-20 mm) to about a length of 30 mm to 40 mm, carefully slide it onto the end of the cable, and then carefully slip the wires all the way into the grounding terminal.

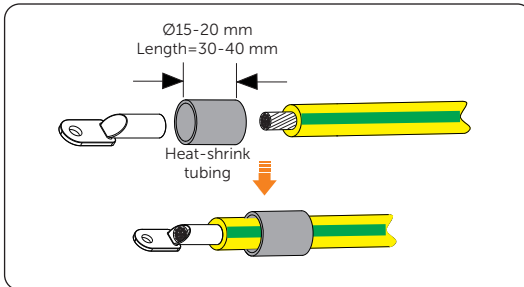


Figure 7-4 Cutting heat-shrink tubing

Step 3: Crimp the terminal, and heat the heat-shrink tubing after it wraps the end of terminal.

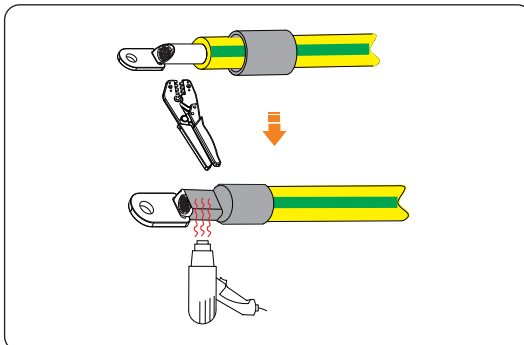


Figure 7-5 Crimping and heating

Step 4: Connect the assembled grounding cable to the grounding port of the cabinet, and then tighten M12 screw (Part L) (torque: 42 ± 2 N·m).

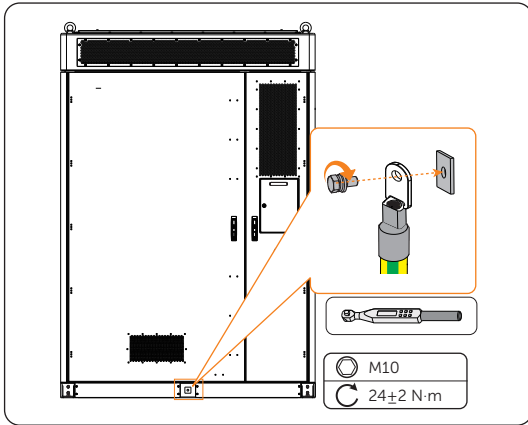


Figure 7-6 Tightening M12 screw

7.2 Inverter Electrical Connection

! DANGER!

- Before electrical connection, make sure the DC switches and AC breakers are disconnected. Otherwise, electrical shock may be caused by high voltage, resulting in serious personal injury or death.

! WARNING!

- Only the qualified personnel can perform the electrical connection following the local standards and requirements.
- Follow this manual or other related document to wire connection. The inverter damage caused by incorrect cabling is not in the scope of warranty.
- Use insulated tools and wear personal protective equipment throughout the electrical connection process.

NOTICE!

- The Grid cable, EPS cable, battery cables, COM1 communication cables of the inverter are prefabricated in the battery cabinet, the cable outlets as shown below:

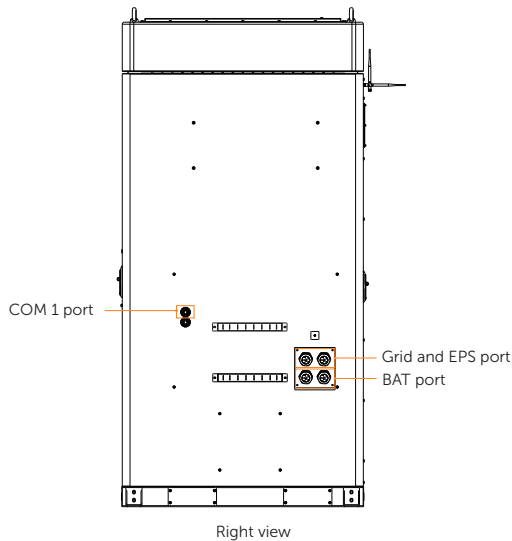


Figure 7-7 Prefabricated inverter cables in battery cabinet

7.2.1 Terminals of Inverter

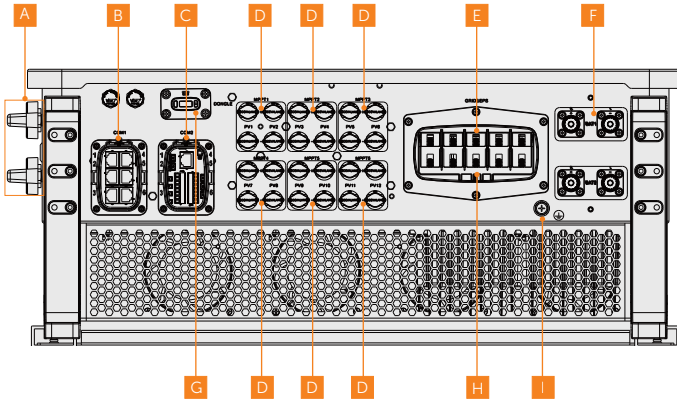


Figure 7-8 Terminals of Inverter

Table 7-1 Description of terminals

Item	Description	Decisive voltage class
A	DC switch (including DC switch 1 and DC switch 2)	-
B	COM 1 communication terminal (including Parallel-1, Parallel-2, BMS-1, BMS-2, RS485, DRM)	DVC-A
C	COM 2 communication terminal (including Ripple control, DIO, Meter/CT)	DVC-A
D	PV connection terminal (PV1~PV5 terminals for X3-AELIO-50K; PV1~PV6 terminals for X3-AELIO-60K)	DVC-C
E	EPS connection terminal	DVC-C
F	Battery connection terminal (including BAT 1 and BAT 2)	DVC-C
G	Dongle terminal	DVC-A
H	Grid connection terminal	DVC-C
I	Ground connection point	-

7.2.2 AC Connection

NOTICE!

- Before connecting the inverter to the grid, approval must be received by local utility as required by national and state interconnection regulations.

The inverter has an EPS function. When the grid is connected, the inverter outputs go through the Grid terminal, and when the grid is disconnected, the inverter outputs go through the EPS terminal.

Requirements for AC connection

- Grid voltage requirement
 - » The grid voltage must be within the permissible range. The inverter is suitable for rated voltage 400V/230V, 380/220V, frequency 50/60Hz. Other technical requests should comply with the requirement of the local public grid.
- RCD requirement
 - » The inverter does not require an external residual-current device when operating. If an external RCD is required by local regulations, it is recommended to use a Type-A RCD with the value of 300 mA. When required by local regulations, the use of an RCD type B is permitted.
- AC breaker requirement
 - » An AC breaker that matches the power of the inverter must be connected between the inverter output and the power grid, and each inverter must be equipped with an independent breaker or other load disconnection unit to ensure the safe disconnection from the grid. Refer to "[4.3 Additionally Required Materials](#)" for specific data of AC breaker of Grid and EPS.
- Load requirement
 - » It is prohibited to connect any load between inverter and AC switch that directly connects to the inverter.
- EPS load requirement
 - » Do not connect sensitive precision instruments or medical device to the EPS terminal.
 - » Ensure that the EPS load rated power is within the EPS rated output power range. Otherwise, the inverter will report an **Overload Fault** warning. When **Overload Fault** occurs, turn off some loads to make sure it is within the EPS rated output power range, and the inverter will return to normal after **ESC** key on the LCD screen pressed.
 - » For inductive load such as fridge, air conditioner, washing machine, etc., ensure that the start power does not exceed the EPS peak power.

Table 7-2 EPS load information

Type of load	Device	Start power
Resistive load	Lamp	Equal to rated power
	Fan	Equal to rated power
	Hairdryer	Equal to rated power
Inductive load	Fridge	3-5 times rated power
	Air conditioner	3-6 times rated power
	Washing machine	3-5 times rated power
	Microwave oven	3-5 times rated power

* Please refer to the nominal current of the device for the actual start current.

Wiring procedures

NOTICE!

The Grid and EPS cables of the inverter outlet from the **Grid and EPS port** in "Figure 7-7 Prefabricated inverter cables in battery cabinet", please strictly follow the steps below.

Step 1: Anti-clockwise loosen the swivel nut and pull out the sealing plugs to disassemble the AC connector (Part O2) as below. Keep the sealing plugs still in the cable support sleeve if you choose not to connect the cable. Replace the original sealing plugs with the five-hole sealing plugs (Part P2).

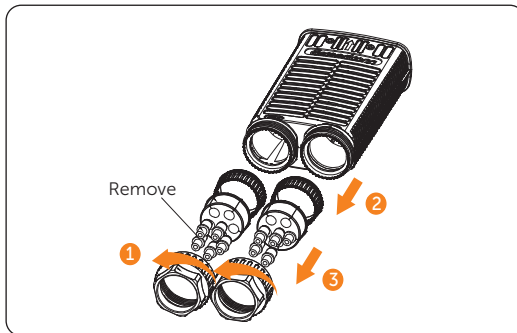


Figure 7-9 Disassembling the AC connector

Step 2: Thread the Grid and EPS cable through the AC connector.

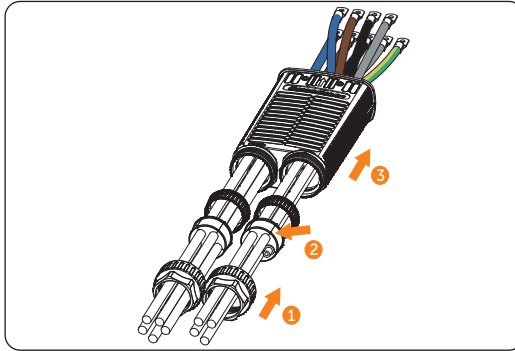


Figure 7-10 Threading cables through the AC connector

Step 3: Secure the L1, L2, L3, N and grounding conductors of the assembled Grid cable with M6 screws. (Torque: 5.0 ± 1.0 N·m) Make sure the conductors are correctly assigned and firmly seated in the terminals.

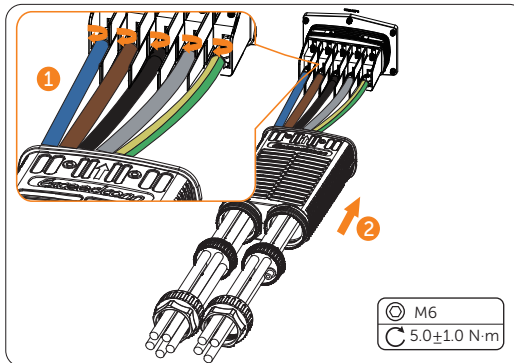


Figure 7-11 Connecting the Grid cable

Step 4: Secure the L1, L2, L3, N conductors of the assembled EPS cable with M6 screws (Part Q2). (Torque: 5.0 ± 1.0 N·m) Make sure the conductors are correctly assigned and firmly seated in the terminals. Connect the enclosure of the AC connector to the inverter, insert the waterproof seals into the AC connector, and tighten the swivel nuts of the connector.

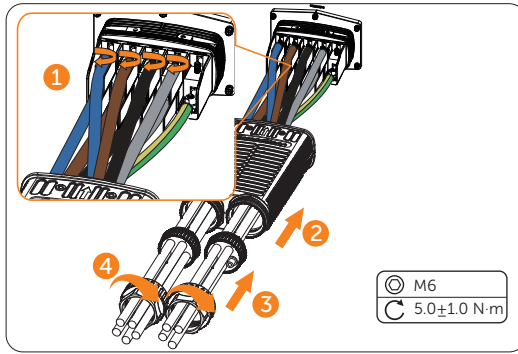


Figure 7-12 Connecting the EPS cable

Step 5: Connect the assembled AC connector to the AC port of the inverter, tighten the two M4*12 screws (Part R2) on the AC connector enclosure (Torque: 1.6±0.1 N·m) and tighten the swivel nuts clockwise.

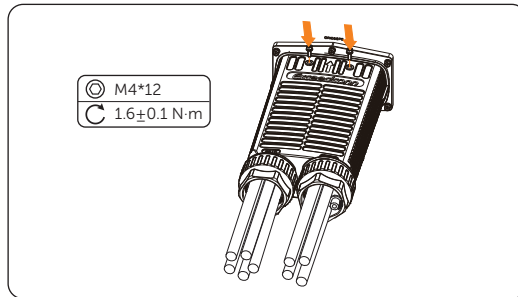


Figure 7-13 Securing the AC connector on the inverter

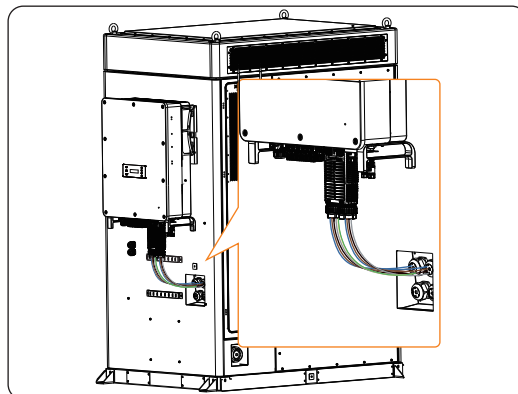


Figure 7-14 Well connected AC connector

 DANGER!

- Before powering on the inverter, make sure the AC connector has been installed correctly on the Grid and EPS terminal even if the EPS terminal is not wired. Otherwise, electrical shock may be caused by high voltage, resulting in serious personal injury or death.

 WARNING!

- Reinstall AC terminal caps immediately after removing the connectors from terminals.

7.2.3 PV Connection

 DANGER!

- High DC voltage will be generated by PV modules when exposed to sunlight. Death or lethal injuries will occur due to electric shock.
- Make sure the DC switch and AC breaker are disconnected from the inverter before connection.
- Make sure that the PV module output is well insulated to ground.

 CAUTION!

- Power is fed from more than one source and more than one live circuit.

Requirements for PV connection

- Open circuit voltage and working voltage
 - » The open circuit voltage of the module array should be less than the maximum PV input voltage (1000 V) of the inverter. Otherwise the inverter may be damaged.
 - » The working voltage should be within the MPPT voltage range (160-950 V). Otherwise, the inverter will prompt **PV Volt Fault**. Consider the impact of low temperature on the voltage of the photovoltaic panels, as lower temperatures tend to result in higher voltages.
 - » The working voltage should be within the full load MPPT range (320-800V). Otherwise, the inverter will prompt derating protection.
- PV module
 - » The PV modules within the same MPPT channel are of the same brand. Additionally, the strings within the same channel should have identical quantities, and be aligned and tilted identically.

- » The positive or negative pole of the PV modules is not grounded.
- » The positive cables of the PV modules must be connected with positive DC connectors.
- » The negative cables of the PV modules must be connected with negative DC connectors.

Wiring procedures

Step 1: Strip approx. 7 mm of the cable insulation.

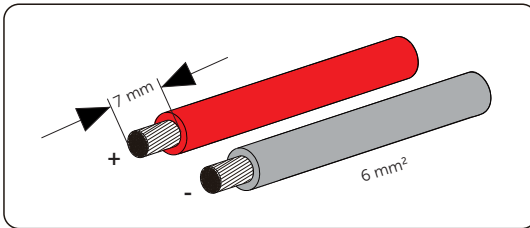


Figure 7-15 Stripping the PV cable

Step 2: Insert the stripped cable into the PV pin contact (Part I2 and Part J2). Ensure that the stripped cable and the PV pin contact are of the same polarity. Crimp it with a crimping tool for PV terminal.

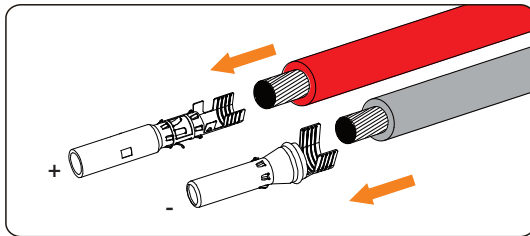


Figure 7-16 Inserting the PV pin contact

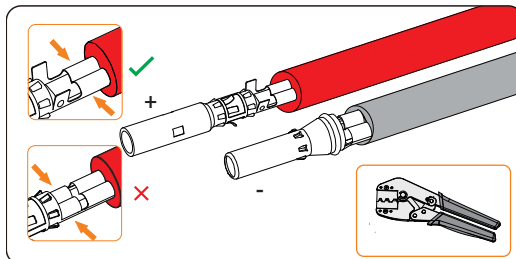


Figure 7-17 Crimping the terminal

WARNING!

- To mitigate the risk of fire, it is crucial to utilize a dedicated crimping tool specifically designed for PV installations to ensure secure and reliable connections.

Step 3: Thread the PV cable through the swivel nut and insert the cable into the PV connector until a "Click" is heard. Gently pull the cable backward to ensure a firm connection. Tighten the swivel nut clockwise. Verify that the PV connectors have the correct polarity before connection.

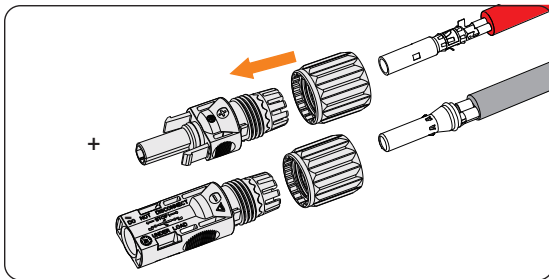


Figure 7-18 Threading the PV cable

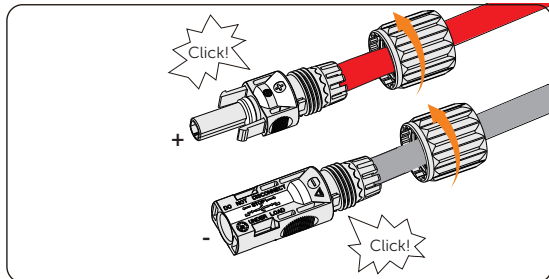


Figure 7-19 Securing the PV cable

Step 4: Use a multimeter to measure the positive and negative voltage of the assembled PV connectors. Make sure the open circuit voltage does not exceed the input limit of 1000 V.

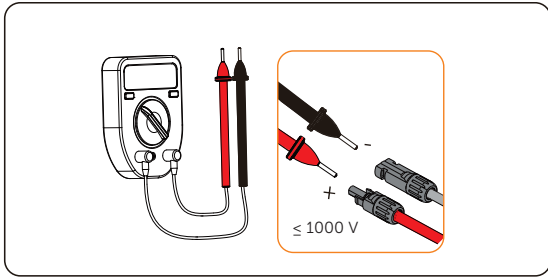


Figure 7-20 Measuring the voltage of PV connectors

NOTICE!

- If the voltage reading is negative, it indicates an incorrect DC input polarity. Please check if the wiring connections on the multimeter is correct or PV connectors are not mistakenly connected.

Step 5: Remove the PV terminal caps and connect the assembled PV connectors to corresponding terminals until there is an audible "Click". The PV+ on the string side must be connected to the PV+ on the inverter side, and the PV- on the string side must be connected to the PV- on the inverter side.

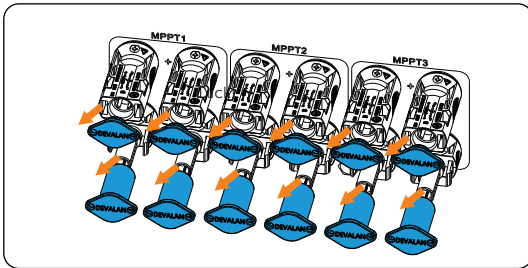


Figure 7-21 Connecting the PV cable

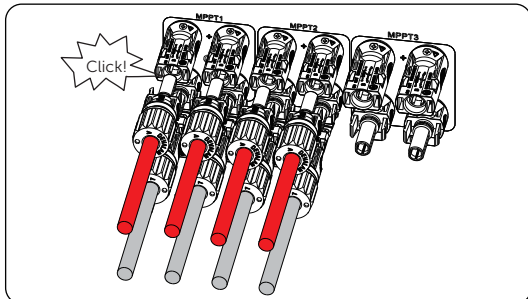


Figure 7-22 Connecting assembled PV cables to the inverter

- Step 6:** Seal the unused positive and negative PV terminals with corresponding PV dustproof buckles (Part S2 and Part T2). Reinstall them immediately after removing the connectors from terminals.

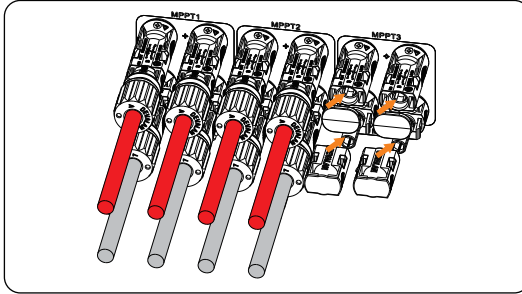


Figure 7-23 Installing PV dustproof buckles

- Step 7:** Secure the PV cables to the bracket with cable ties.

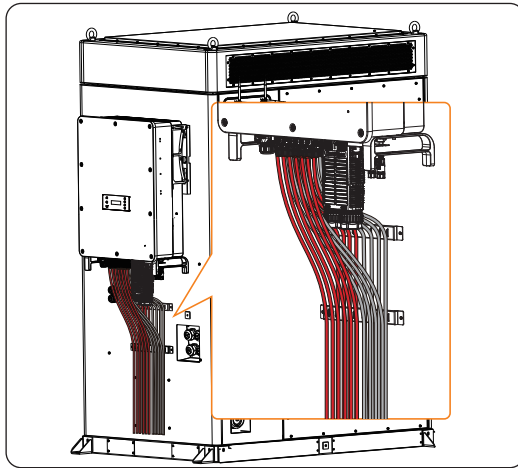


Figure 7-24 Well connected PV cables

7.2.4 Battery Power Cable Connection



- Make sure the breaker of battery is in OFF position.
- Always ensure correct polarity. Never reverse the polarity of the battery cables as this will result in inverter damage.

Requirements for battery connection

- Required battery
 - » The inverter is equipped with two independent battery terminals, allowing for connection to two battery cabinets. Max charge and discharge current is 160 (80*2) A for each BAT terminal.
 - » Make sure the input voltage of each BAT terminal is higher than minimum voltage 180 V and lower than maximum input voltage 820 V.
- Micro circuit breaker (MCB)
 - » If local regulations mandate the use of a DC MCB between the battery and the inverter, install a non-polar DC MCB.
 - » Nominal voltage of DC MCB should be larger than maximum voltage of battery.

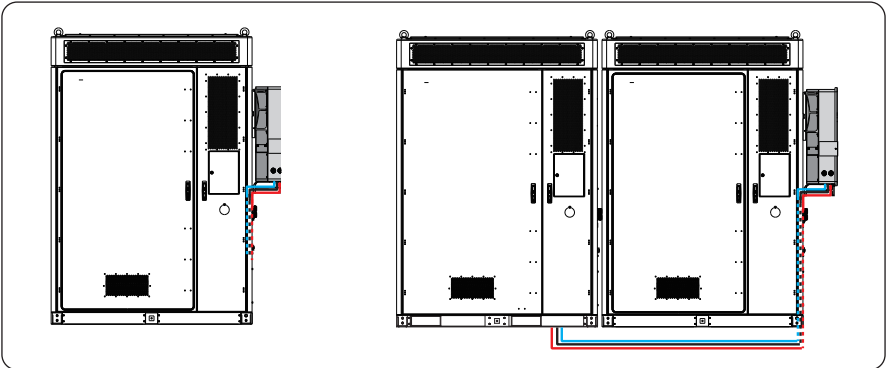


Figure 7-25 Inverter with battery cabinet(s)

Wiring procedures

NOTICE!

- The Grid and EPS cables of the inverter outlet from the Grid and EPS port in “[Figure 7-7 Prefabricated inverter cables in battery cabinet](#)”, please strictly follow the steps below.
- When the battery capacity requires expansion, BAT2 can be connected to AELIO-B100 or AELIO-B200 battery cabinets with the same wiring method.

Step 1: Loosen the screws on the battery protective cover and remove the cover. Pull out the battery caps.

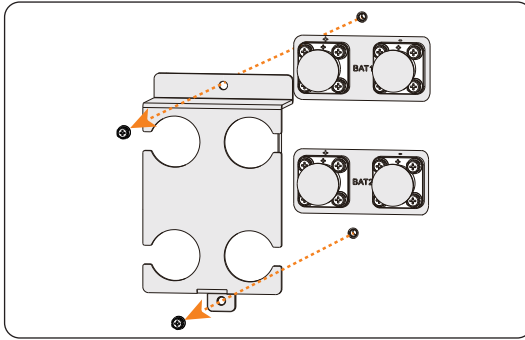


Figure 7-26 Removing the battery protective cover

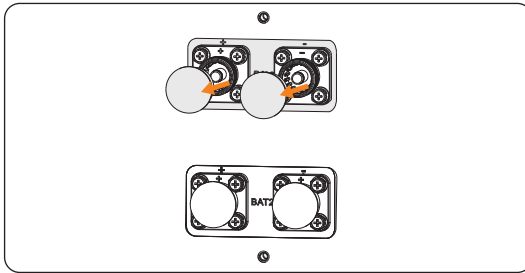


Figure 7-27 Removing battery caps

Step 2: Connect the assembled battery connectors to corresponding terminals until there is an audible "Click". The BAT+ on the string side must be connected to the BAT+ on the inverter side, and the BAT- on the string side must be connected to the BAT- on the inverter side. Gently pull the cable backward to ensure firm connection.

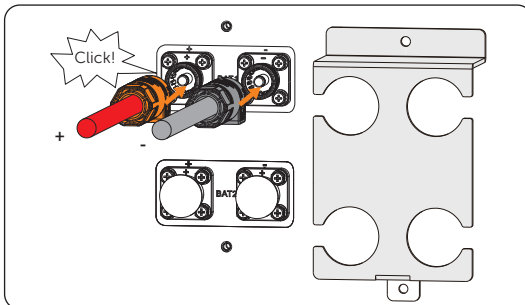


Figure 7-28 Connecting assembled battery cables

Step 3: After the battery cables are connected, install the battery protective cover and secure the cover on the inverter with screws.

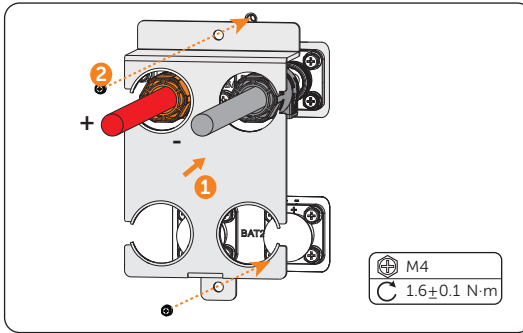


Figure 7-29 Installing the battery protective cover

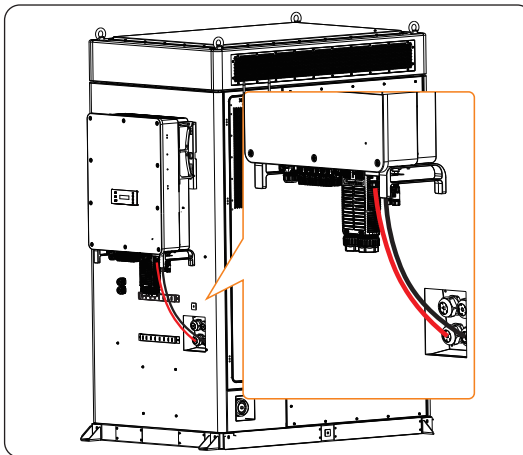


Figure 7-30 Well connected battery cables

WARNING!

- Seal the unused battery terminals with original terminal caps.
- Keep the terminal caps in a safe place if battery cables are connected to the inverter.
- Reinstall it immediately after removing the connectors from terminals.

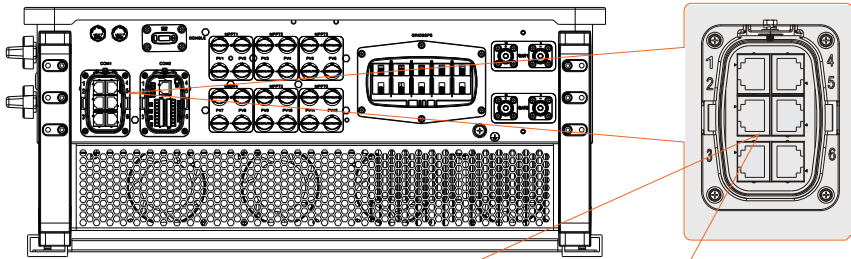
NOTICE!

- Please refer to the battery document for specific wiring procedures on the battery side.

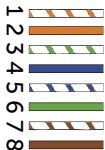
7.2.5 COM 1 Communication Connection

Pin assignment of COM 1 terminal

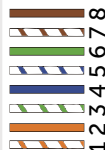
The COM 1 terminal is used for cabinet and inverter communication via PARALLEL-1 communication terminal, parallel connection and via PARALLEL-1 and PARALLEL-2 communication terminal, battery communication via BMS-1 and BMS-2 terminal, external device communication via RS485 and DRM function.



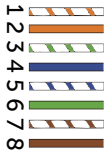
PARALLEL 1
 1: PARALLEL_485A
 2: PARALLEL_485B
 3: DATA_BUS
 4: PARALLEL_CANH
 5: PARALLEL_CANL
 6: GND_COM
 7: PARALLEL_SYNC1
 8: PARALLEL_SYNC2



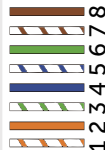
PARALLEL 2
 1: PARALLEL_485A
 2: PARALLEL_485B
 3: DATA_BUS
 4: PARALLEL_CANH
 5: PARALLEL_CANL
 6: GND_COM
 7: PARALLEL_SYNC1
 8: PARALLEL_SYNC2



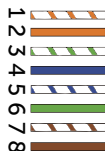
BMS1
 1: BAT_TEMP
 2: GND_COM
 3: GND_COM
 4: BMS1_CANH
 5: BMS1_CANL
 6: BAT_WAKEUP_POWER
 7: BMS1_485A
 8: BMS1_485B



BMS2
 1: BAT_TEMP
 2: GND_COM
 3: GND_COM
 4: BMS2_CANH
 5: BMS2_CANL
 6: BAT_WAKEUP_POWER
 7: BMS2_485A
 8: BMS2_485B



RS485
 1: REMOTE_485A
 2: REMOTE_485B
 3: NC
 4: PARALLEL_485AA
 5: PARALLEL_485BB
 6: NC
 7: REMOTE_485A
 8: REMOTE_485B



DRM
 1: DRM1/5
 2: DRM2/6
 3: DRM3/7
 4: DRM4/8
 5: +3.3V_COM
 6: COM/DRM0
 7: GND_COM
 8: GND_COM



NOTICE!

The COM 1 cables of the inverter outlet from the **COM 1 port** in “Figure 7-7 Prefabricated inverter cables in battery cabinet”, please strictly follow the steps below.

Cabinet and inverter communication and parallel communication connection

The inverter provides the parallel connection function. One inverter will be set as the “Master inverter” to control the other “Slave inverters” in the system.

- Parallel connection wiring procedure

Step 1: Loosen the screws on the COM 1 terminal. Pinch the tabs on the sides of the COM 1 connector enclosure and pull it at the same time to disassemble it.

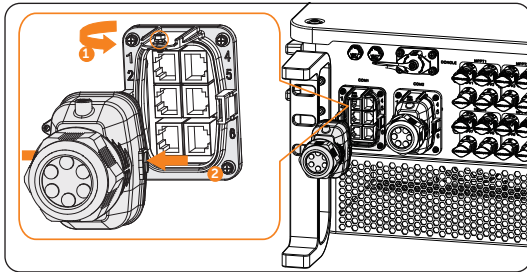


Figure 7-31 Removing the connector enclosure

Step 2: Anti-clockwise loosen the swivel nut and pull out the sealing plugs. Keep the sealing plugs still in the cable support sleeve if you choose not to connect the cable.

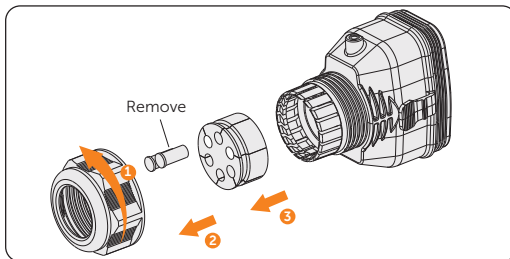


Figure 7-32 Disassembling the connector

Step 3: Thread the network cables.

- » Method 1: If your network cable has already been connected with RJ45 terminal (Part E2), you can directly thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

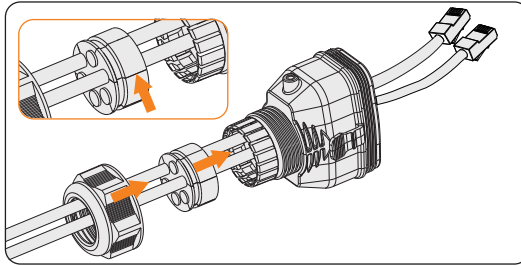


Figure 7-33 Threading the cables with RJ45 terminal

- » Method 2: If your network cable is not connected to an RJ45 terminal, you will need to assemble the cable before proceeding.

Thread the cables without RJ45 terminal through the swivel nut, cable support sleeve, and connector enclosure in sequence. Strip approx. 15 mm of the cable insulation.

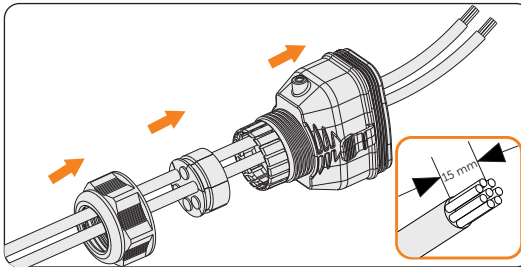


Figure 7-34 Threading the cables and stripping the insulation

Insert the stripped section into the RJ45 terminal. Crimp it tightly with a crimping tool for RJ45. Pay attention to pin order of RJ45 terminal.

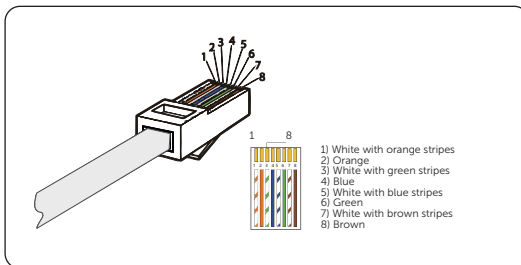


Figure 7-35 Crimping the communication cable

NOTICE!

- Use network cable tester to test the crimped cable before connecting to the inverter.

Step 4: Install the network cables with a crimped RJ45 terminal to Parallel-1 and Parallel -2 of cable clamp (Part C2) according to the labeling.

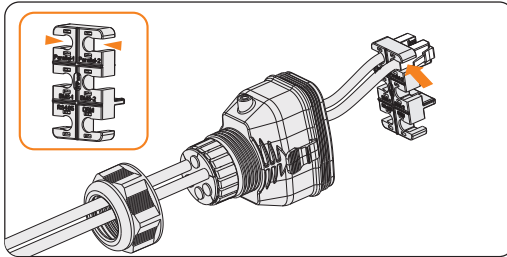


Figure 7-36 Installing the cable to the cable clamp

Step 5: Connect the assembled connector to COM 1 terminal. Ensure the cable clamp tongue is well inserted into the slot of terminal. You will hear an audible "Click" if it is connected securely. Lightly pull the cable for double check its connection.

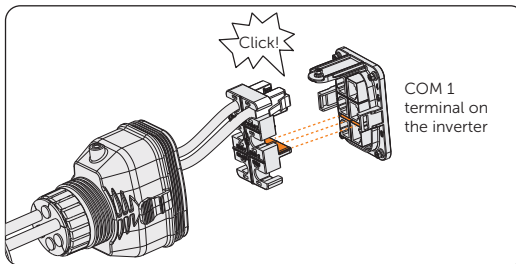


Figure 7-37 Inserting the connector to COM 1

- Step 6:** Secure the assembled connector on COM 1 terminal.
- Install the connector enclosure back into the COM 1 terminal.
 - Install the cable support sleeve into the enclosure.
 - Tighten M3 screw to secure it. (Torque: 0.6 ± 0.1 N·m)
 - Clockwise tighten the swivel nut to finish the COM 1 wiring connection.

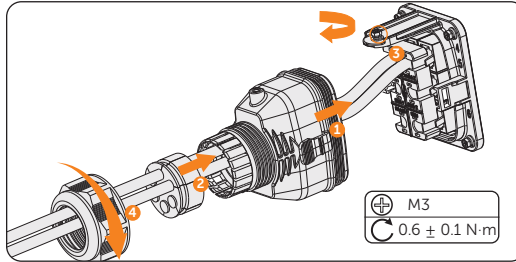


Figure 7-38 Securing the connector

BMS communication connection

Through BMS-1 and BMS-2 communication terminal, the inverter can be connected to two AELIO-B100 battery cabinet.

- BMS connection diagram

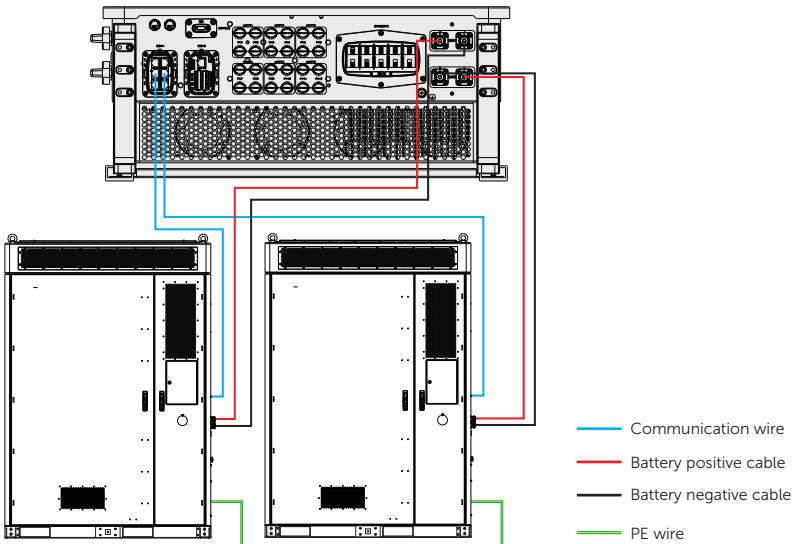


Figure 7-39 BMS connection diagram