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Single-phase Hybrid Inverter

USER MANUAL

HYS-8.0LV-EUG2
HYS-10.0LV-EUG2
HYS-12.0LV-EUG2

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1. Safety Introduction

1.1 Explanation of Symbols

The following types of safety precautions and general information symbols used in this manual must be followed during the installation, operation, and maintenance of the inverter.

Symbol	Usage
	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk that, if not avoided, can result in death or serious injury.
	Indicates a hazard with a low level of risk that, if not avoided, can result in minor or moderate injury.
	Indicates a situation that, if not avoided, can result in property damage. NOTICE is used to address practices not related to personal injury.
	Caution! Failure to observe any warnings contained in this manual may result in injury.
	Danger to life due to high voltages! Only qualified personnel can open and maintain the inverter.
	Burn danger due to hot surface that may exceed 60℃.
	Refer to the operating instructions.
	After the inverter is turned off, wait for at least 5 minutes before opening the inverter or touching live parts.
	Products shall not be disposed as household waste.
CE	CE mark.

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	This side up! This package must always be transported, handled, and stored in such a way that the arrows always point upwards.
	Fragile - The package/product should be handled carefully and should never be tipped over or slung.
	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	A maximum of six (6) identical packages can be stacked.

1.2 Safety Information

This chapter contains important safety and operating instructions. For future reference, please read and keep this manual.

For the purpose of preventing personal injury and property damage, as well as ensuring the long-term operation of the product, please read and follow all the instructions and cautions on the inverter and in this user manual during installation, operation, and maintenance.

Safety instructions in this manual cannot cover all precautions that should be taken. Please consider the actual conditions when performing operations. Any damage caused by a violation of the safety instructions in this manual shall not be the responsibility of Hoymiles.

Symbol	Usage
	**Danger to life from electric shock** • Before performing any work on the inverter, disconnect all DC and AC power from inverter and wait for at least 5 minutes. The hazardous voltage will exist for up to 5 minutes after disconnection from power supply. • Never insert or remove the AC or DC connections when the inverter is running. • Any live parts connected to battery ports cannot be touched before removing all the power from the inverter for 5 minutes because there is still danger to life even battery voltage is lower than 60 V. • Do not touch DC conductors or any non-isolated cable ends. • The mounting location must be inaccessible to children. • Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both at the same time.
	**Risk of burns from hot surfaces** • The surface of the inverter might exceed 60℃, and touching the surface may result in burns. • Do not touch hot surfaces before it cools down.

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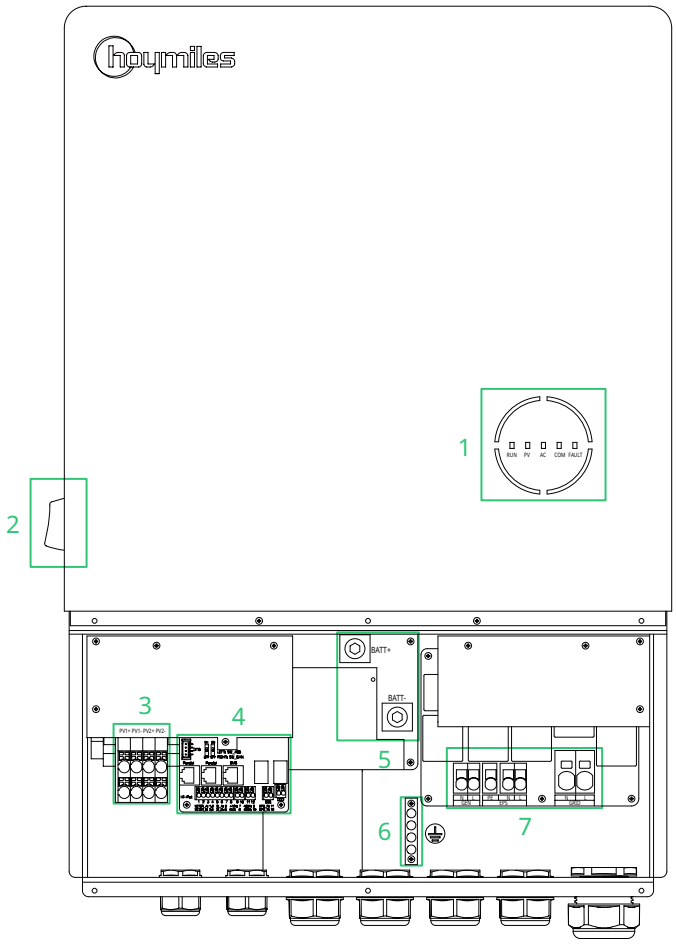
 WARNING	• Only authorized service personnel are allowed to install the inverter or perform servicing and maintenance. • All powers, both AC and DC, should be disconnected from the inverter before attempting any maintenance, cleaning, or working on any circuits connected to the inverter. • Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty. • Keep away from flammable and explosive materials to avoid fire disasters. • The installation place should be away from humid or corrosive substances. • The unit contains capacitors that remain charged to a potentially lethal voltage after the mains, battery, and PV supply have been disconnected. • When accessing the internal circuit of the inverter, wait for at least 5 minutes after disconnecting the power.
 CAUTION	• The inverter has a transformerless design on the PV side. Neither positive nor negative terminals of PV panels should be grounded. • The frames of PV panels should be grounded for safety reasons. • Ensure that existing wiring is in good condition and no wire is undersized. • Do not disassemble any parts of the inverter which are not mentioned in the installation. • Authorized service personnel must use insulated tools when installing or working with this equipment. • PV modules shall have an IEC 61730 class A rating.
 NOTICE	• The minimum rated temperature of the wire used is 90℃. • All electrical connections must be in accordance with local and national standards. • Only with permission of the local utility grid company, the inverter can be connected to the utility grid. • Do not open the inverter cover or change any components without authorization, otherwise the warranty commitment for the inverter will be invalid. • Appropriate methods must be adopted to protect the inverter from electrostatic discharge; any damage caused by ESD is not warranted by the manufacturer. • Prior to the application, please read this section carefully to ensure correct and safe application. Please keep the user manual properly. • The manual contains no instructions for user-serviceable parts. See Warranty for instructions on obtaining service. • If an error occurs, contact your local distributor or qualified electricians.

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2. Product Introduction

2.1 Product Overview

The HYS-LV series is a high-performance single-phase hybrid inverter with excellent reliability. The intelligent EMS function supports self-consumption, economic, and backup modes for multi-scenario applications. Monitoring management through S-Miles Cloud allows users to remotely diagnose and track the system performance over time, offering superior energy production.

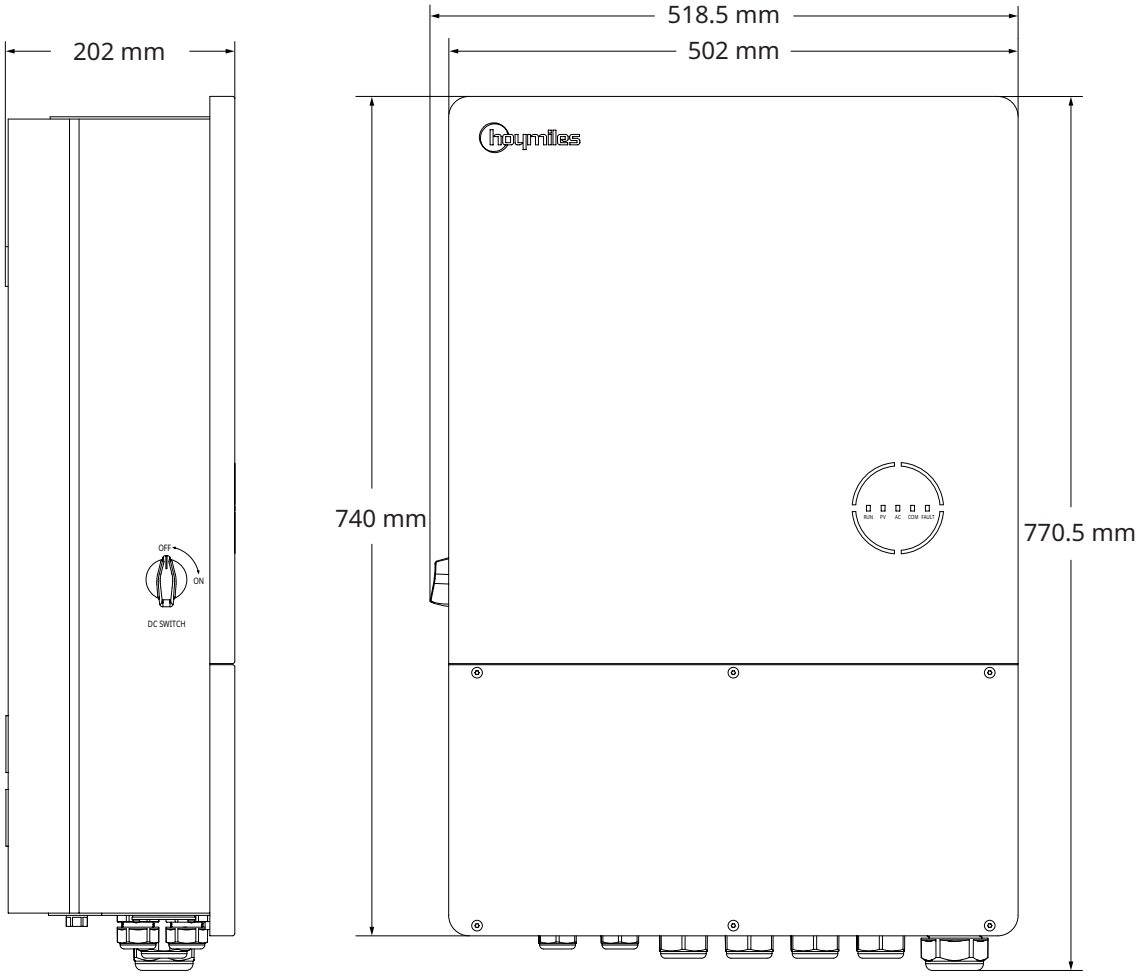


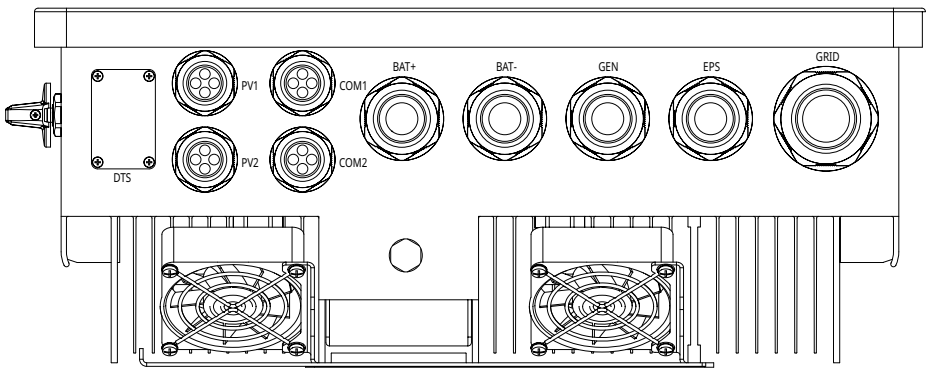
* The image shown here is for reference only. The actual product received may differ.

Object	Description
1	LED Indicators
2	DC Switch
3	PV Terminals
4	Communication Port
5	Battery Terminals
6	Grounding Bar
7	AC Terminals

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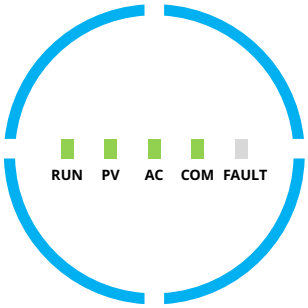
2.2 Product Dimensions

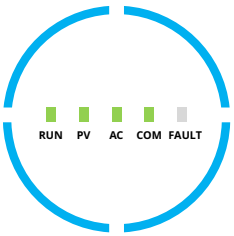
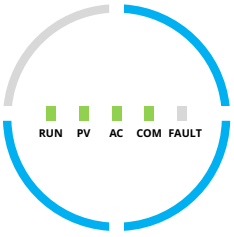
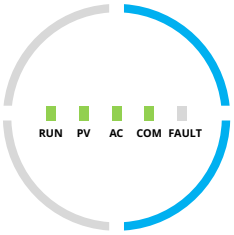
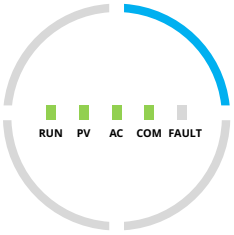
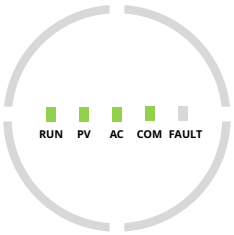




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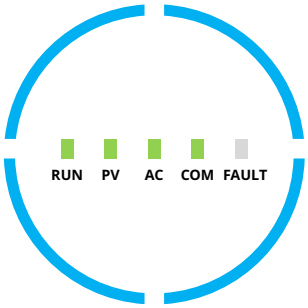
2.3 LED Indicators



Indicator	Status	Explanation
SOC		Full circle LEDs on – SOC is 75-100%; battery is discharging or in standby Full circle LEDs blink – SOC is 75-100%; battery is charging
		3/4 circle LEDs on – SOC is 50-75%; battery is discharging or in standby 3/4 circle LEDs blink – SOC is 50-75%; battery is charging
		2/4 circle LEDs on – SOC is 25-50%; battery is discharging or in standby 2/4 circle LEDs blink – SOC is 25-50%; battery is charging
		1/4 circle LED on – SOC is 0-25%; battery is discharging or in standby 1/4 circle LED blinks – SOC is 0-25%; battery is charging
		Full circle LEDs off – No BMS communication

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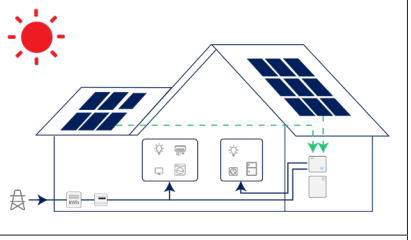
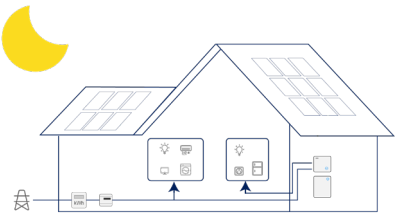
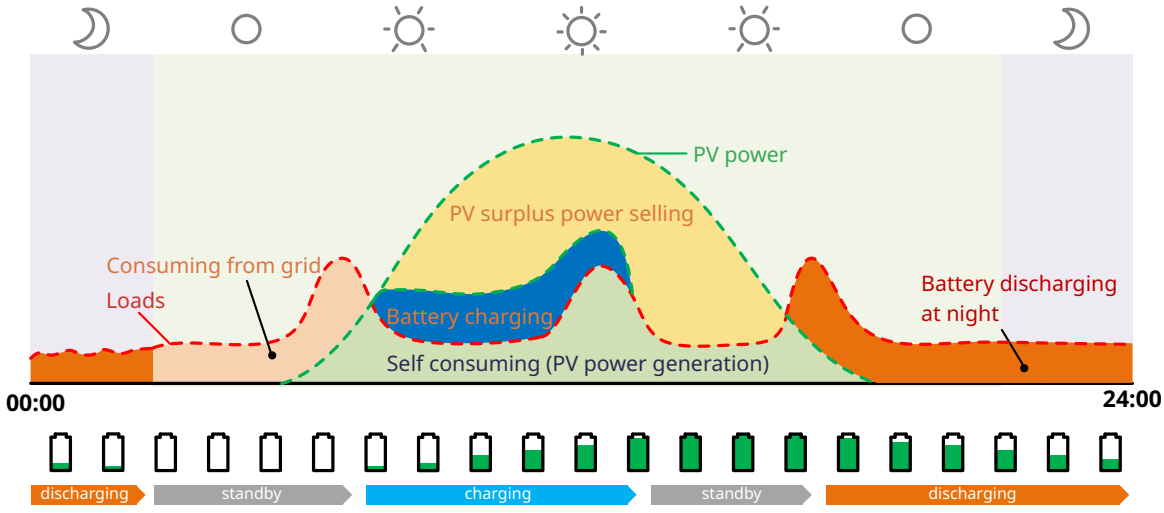
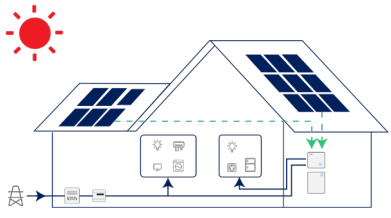


Indicator	Status	Explanation
RUN		Off – Inverter is shut down Blink 1 – Inverter is booting Blink 2 – Inverter is in bypass mode On – Inverter is turned on
PV		Off – PV voltage is low Blink 1 – PV power is low On – PV is generating power
AC		Off – Grid is disconnected and EPS is off, or a grid fault occurs Blink 1 – Grid is disconnected but EPS is on On – Grid is connected
COM		Off – Communication error of both meter and BMS Blink 1 – Communication failed to meter Blink 2 – Communication failed to BMS On – Both meter and BMS communications are normal
FAULT		Off – No fault On - A fault occurs Blink 1 – EPS port overload Blink 2 – ISO/RCD fault Blink 3 – Arc fault

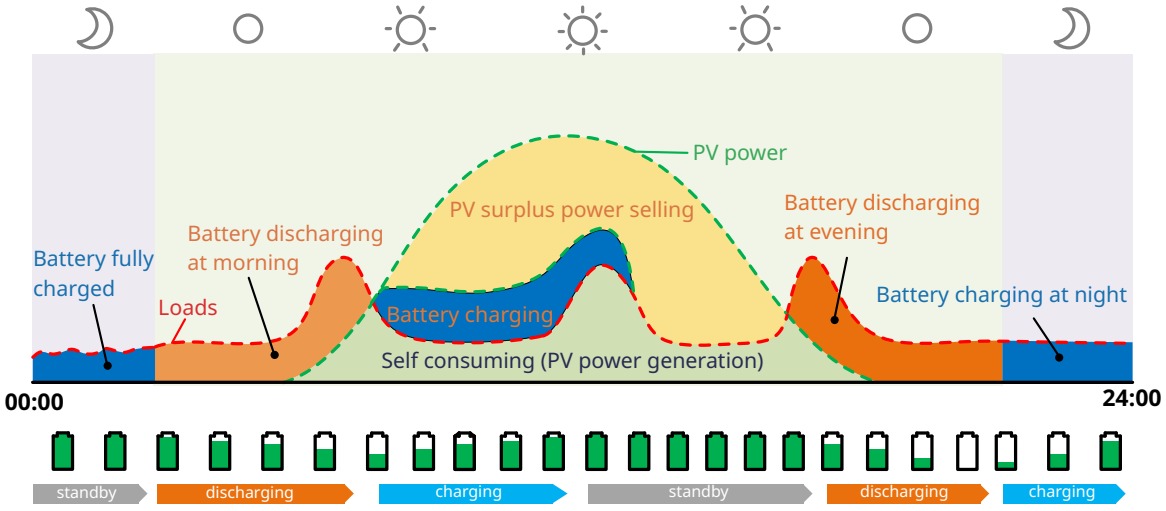
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2.4 Operating Modes

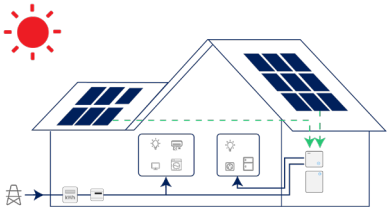
<table>
<tr><th colspan="3">Main Operation Modes</th></tr>
<tr><td>Self-consumption Mode</td><td>In the daytime, solar energy supports the loads first and surplus energy is stored in the battery. When the battery is fully charged or reaches the maximum charge power, the rest energy is fed into the grid (or limited if required).

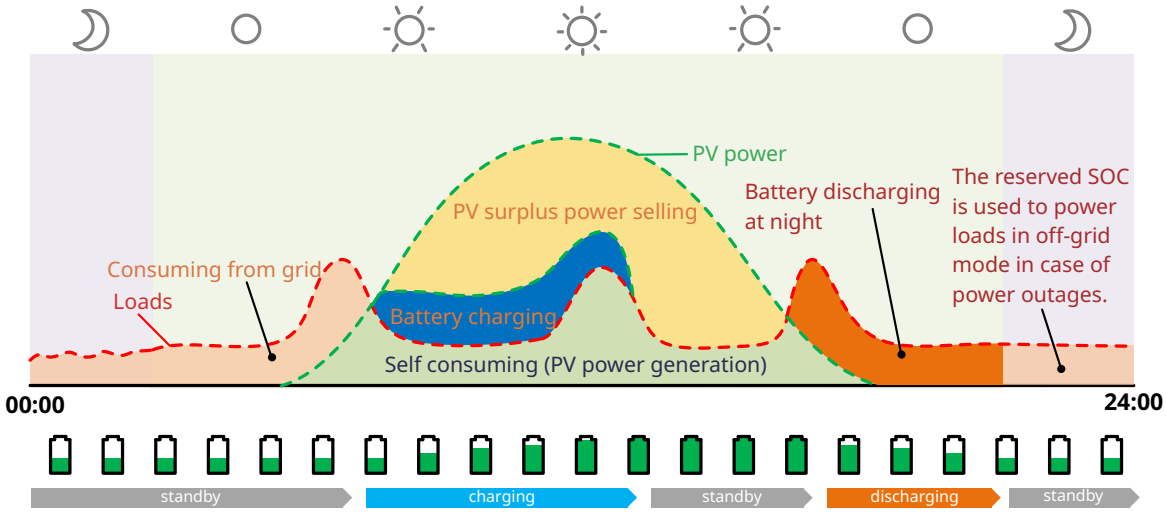
At night, the battery discharges for the loads first and the grid will supply the loads once the battery power is not enough. In this mode, the battery cannot be charged from the grid at night.</td><td>
</td></tr>
<tr><td colspan="3">
</td></tr>
<tr><td colspan="3">Power flow of self-consumption mode</td></tr>
<tr><td>Economy Mode</td><td>In this mode, the time of battery charge and discharge needs to be set. The battery can be forced to charge from the grid during the preset charge time. For instance, the battery could be charged or discharged according to valley or peak electricity price.</td><td></td></tr>
</table>

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Power flow of economy mode

Backup Mode	In case of frequent power outages, a backup power SOC can be configured, which ensures that the battery always has enough energy to handle critical loads.	

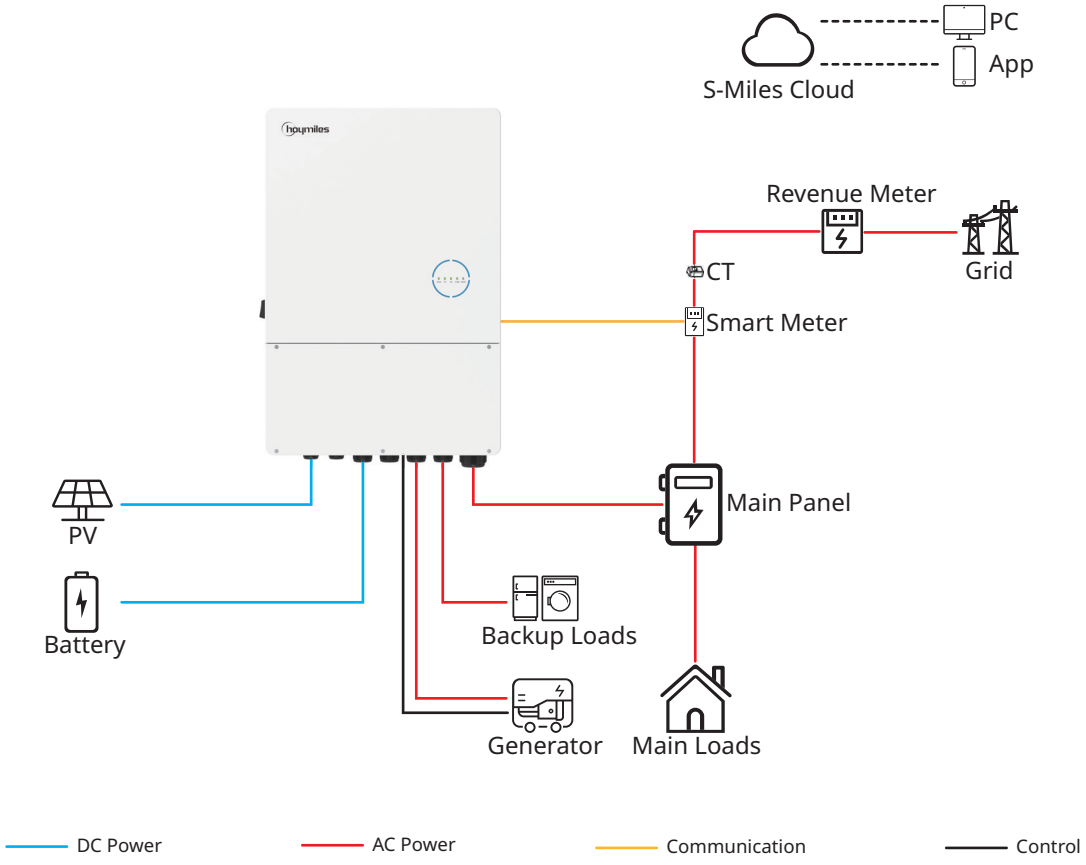


Power flow of backup mode

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2.5 System Diagram

The HYS-LV series inverter can be connected to a battery and PV panels to form a PV Energy Storage System (ESS). In the event of a grid outage, it can be used as an emergency power supply (EPS) through the self-consumption of solar energy. It can form a DC-coupled system for a new installation or an AC-coupled system to retrofit existing installations.



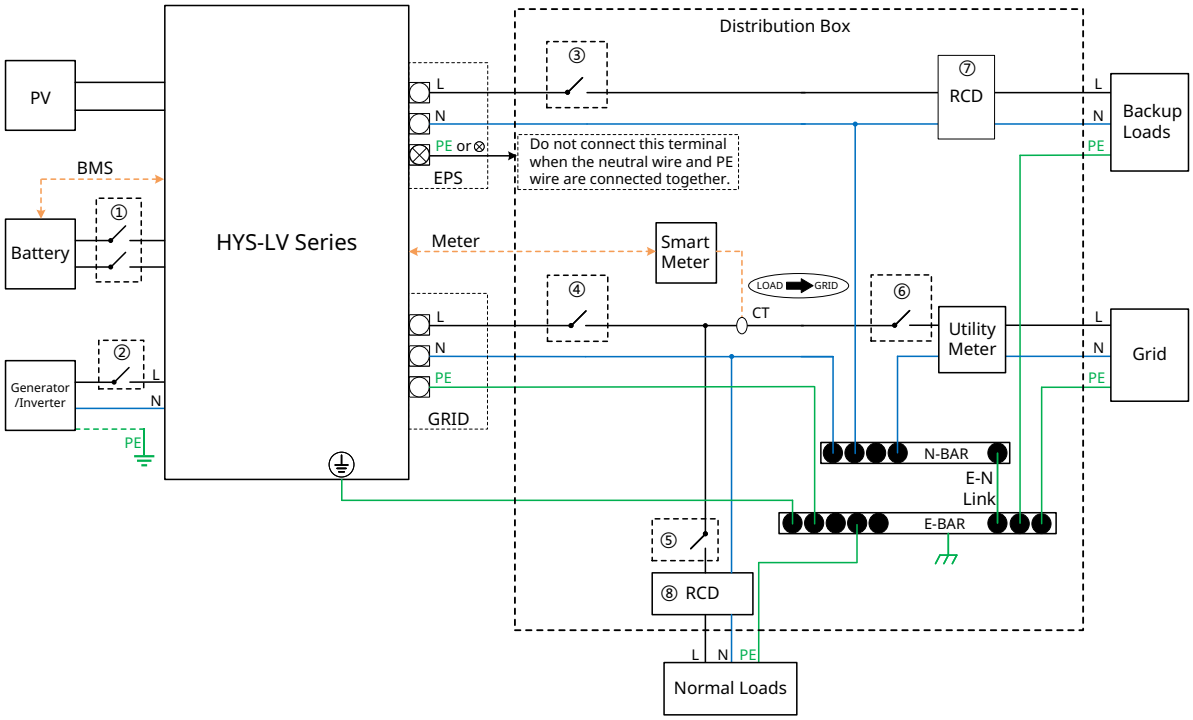
NOTICE	• This diagram is a simplified system sketch that is only intended to explain system architecture. • Please refer to https://www.hoymiles.com for the compatible battery list, and the user should first contact Hoymiles for technical consultation and obtain official confirmation before installing any battery not included in the official published list. • Lead-acid battery is not recommended for general customers as it requires experienced installers and technicians who can fully understand the battery parameters and configure the settings and installations correctly. Please contact Hoymiles for technical support on lead-acid battery installation.

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2.5.1 Basic Diagram

A. Diagram for Australia, New Zealand, South Africa, etc.

NOTICE	• This diagram is an example of application in which the neutral connects with PE in the distribution box. • For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regulations!



Model	①	②	③	④	⑤	⑥	⑦⑧
HYS-8.0LV-EUG2	200 A/60 V DC Fuse	50 A/230 V AC Breaker	50 A/230 V AC Breaker	125 A/230 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HYS-10.0LV-EUG2	250 A/60 V DC Fuse	63 A/230 V AC Breaker	63 A/230 V AC Breaker	125 A/230 V AC Breaker			
HYS-12.0LV-EUG2	300 A/60 V DC Fuse	80 A/230 V AC Breaker	80 A/230 V AC Breaker	125 A/230 V AC Breaker			

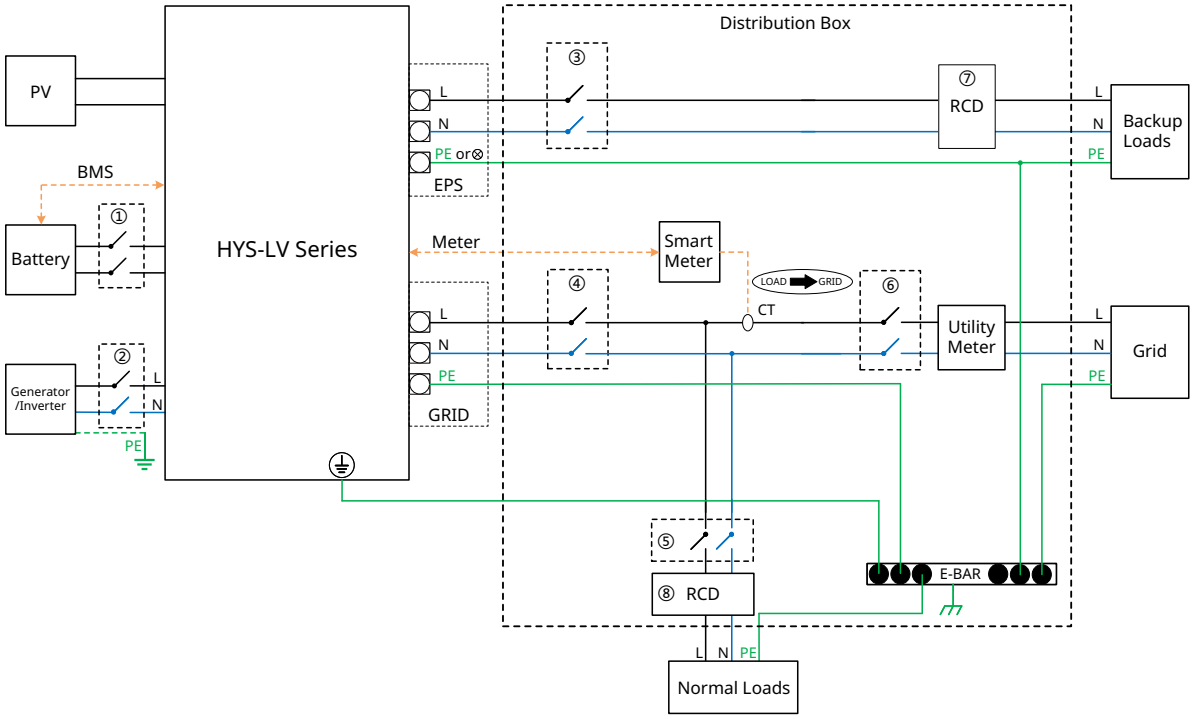
Note:

- If the battery integrates a readily accessible internal DC breaker or fuse, no additional ① DC breaker or fuse is required.
- If the generator has integrated a readily accessible internal AC breaker, then no additional ② AC breaker is required.
- ⑦⑧ 30 mA RCD is recommended but not mandatory; please comply with local regulations.

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B. Diagram for Other Countries

NOTICE	• This diagram is an example of application in which the neutral is separated from the PE in the distribution box. • For countries such as China, Germany, Italy, etc., please follow local wiring regulations! • The backup PE line and earthing bar must be grounded properly and effectively. Otherwise, the backup function may be abnormal when the grid fails.



Model	①	②	③	④	⑤	⑥	⑦⑧
HYS-8.0LV-EUG2	200 A/60 V DC Fuse	50 A/230 V AC Breaker	50 A/230 V AC Breaker	125 A/230 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HYS-10.0LV-EUG2	250 A/60 V DC Fuse	63 A/230 V AC Breaker	63 A/230 V AC Breaker	125 A/230 V AC Breaker			
HYS-12.0LV-EUG2	300 A/60 V DC Fuse	80 A/230 V AC Breaker	80 A/230 V AC Breaker	125 A/230 V AC Breaker			

Note:

- If the battery integrates a readily accessible internal DC breaker or fuse, no additional ① DC breaker or fuse is required.
- If the generator has integrated a readily accessible internal AC breaker, then no additional ② AC breaker is required.
- ⑦⑧ 30 mA RCD is recommended but not mandatory; please comply with local regulations.

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2.5.2 Retrofit Diagram

The HYS-LV series inverter is compatible with any single-phase grid-connected PV inverter. With the addition of the Hoymiles hybrid inverter, the existing PV system can be retrofitted to be a PV Energy Storage System (ESS) allowing more self-consumption energy and more backup energy.
Consult with your system integrator for detailed wiring according to your requirements.

Diagram 1

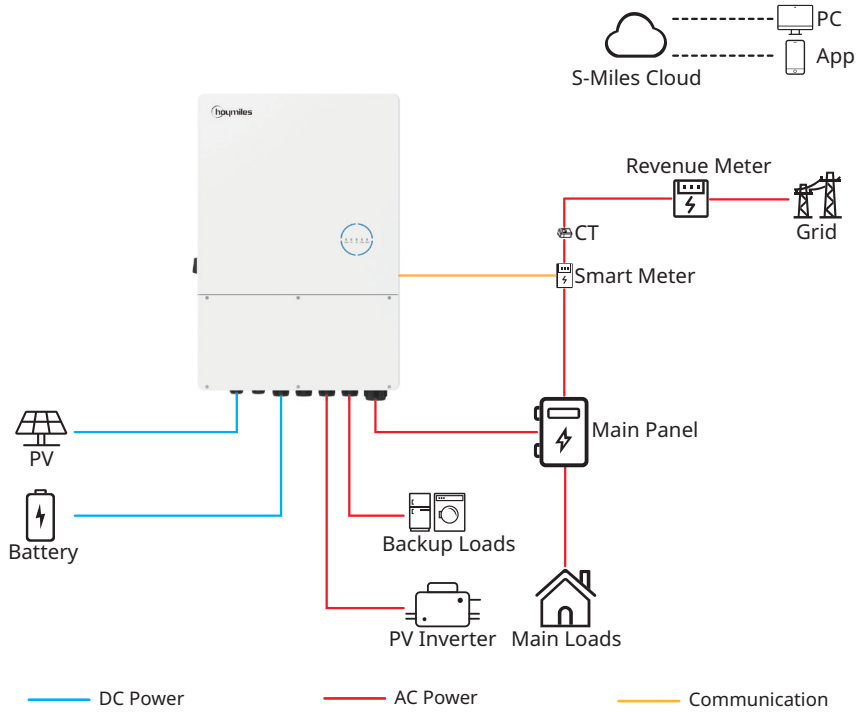
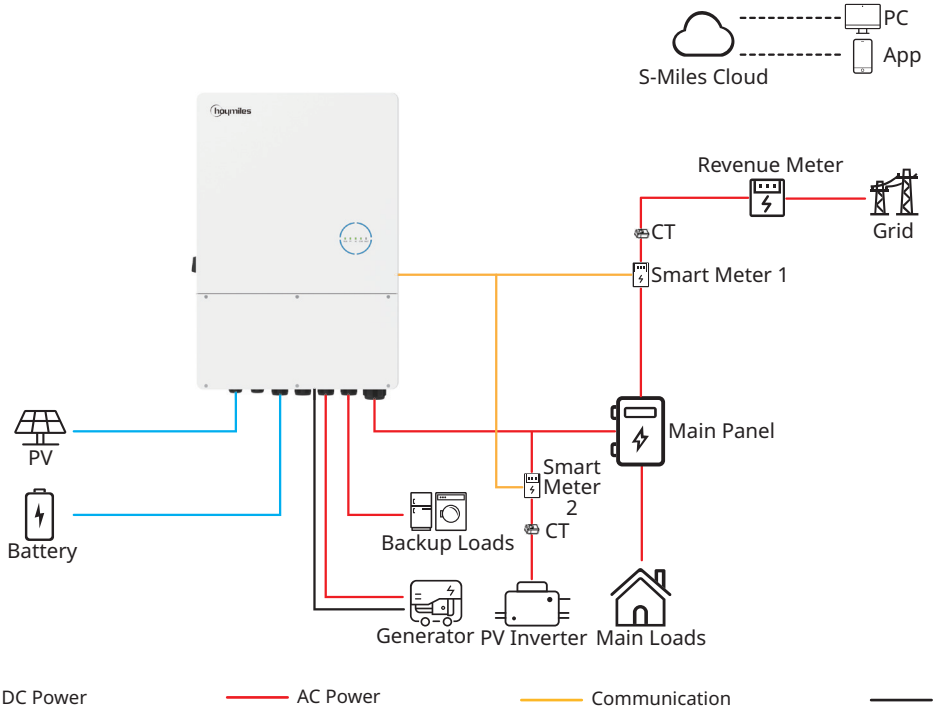


Diagram 2



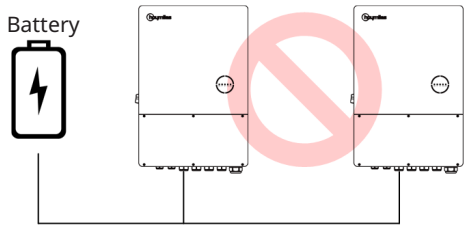
Note:

- If there is a strong desire to use this system in off-grid mode, it is recommended to connect the PV inverter to the GEN port (Diagram 1); if not, it is recommended to connect the PV inverter to the grid port (Diagram 2).
- If the PV inverter is connected to the GEN port, the power of the PV inverter shall be less than the rated output power of Hoymiles hybrid inverter.
- If power export management is required, the power of the PV inverter shall be less than the battery charge power. The zero-export function will be disabled after the battery is fully charged.

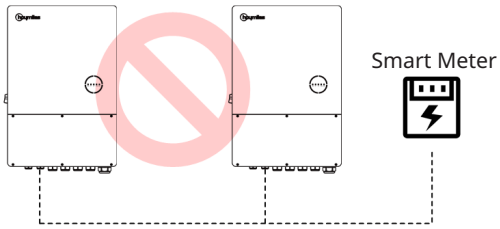
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2.5.3 Unacceptable Diagram

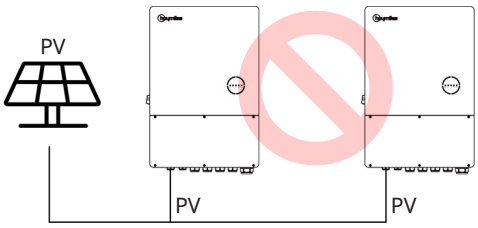
Avoid the following installation types to prevent damage to the system or the inverter.



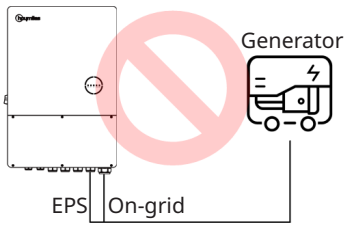
One battery cannot be connected to multiple inverters.



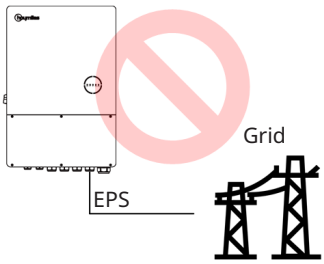
One meter cannot be connected to multiple inverters and different CTs cannot be connected to the same line cable.



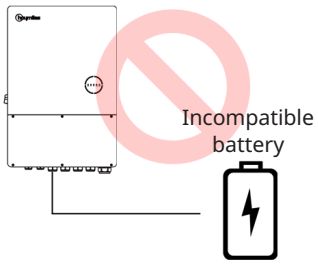
Single PV cannot be connected to multiple inverters.



Neither EPS or on-grid port can be connected to generator directly.



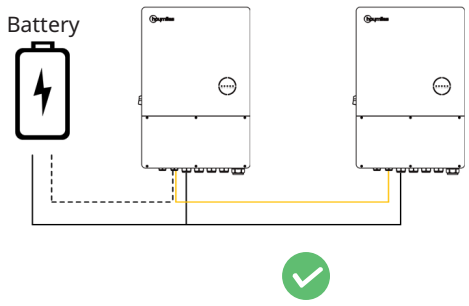
EPS port cannot be connected to grid directly.

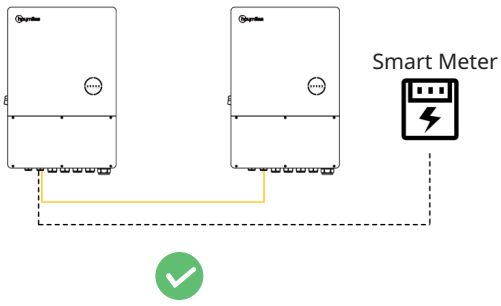


Incompatible battery cannot be connected to battery port.

Note:

The following two diagrams are acceptable if the inverters are connected in parallel.



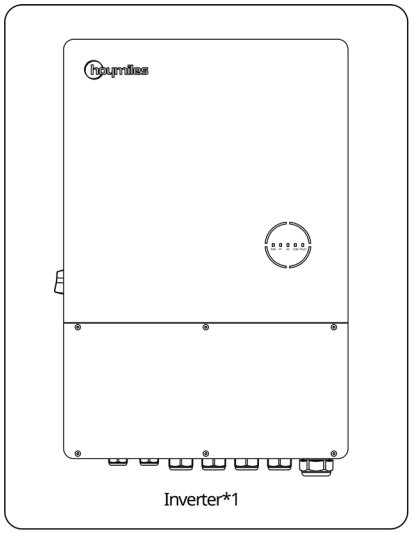


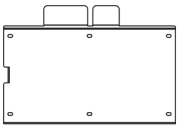
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3. Installation Instruction

3.1 Packing List

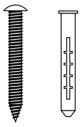
Please ensure that none of the components listed below are missing or damaged upon receipt of the hybrid inverter.


Inverter*1


Bracket*1



Document*1

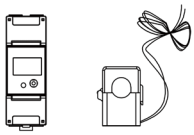

Expansion Screw M6*6
Sleeve*6

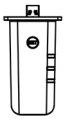

Ground Terminal*1


Screw M4*2


DTS Connecting Line*1

Accessories Packing List

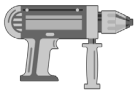

Smart Meter*1 CT*1

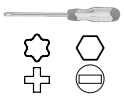

DTS*1
Optional (Wi-Fi, Ethernet, 4G)


Battery Temperature Sensor*1

3.2 Installation Tools

The following tools are recommended in the installation process, and other auxiliary tools can also be used on site if necessary.


Hammer drill


Screwdriver


Wire stripper


Network cable crimper


Safety gloves


Dust mask


Safety shoes


Protective goggles

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3.3 Mounting

3.3.1 Selecting the Mounting Location

WARNING	• Make sure there is no electrical connection before installation. • In order to avoid electric shock or other injuries, make sure that holes are not drilled over any electrical parts or plumbing installations.
NOTICE	• Make sure the inverter is correctly installed according to the following list. Any incorrect installation would require a risk assessment.

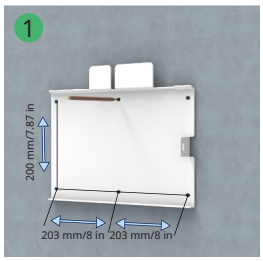
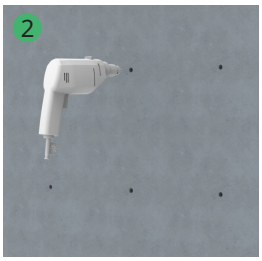
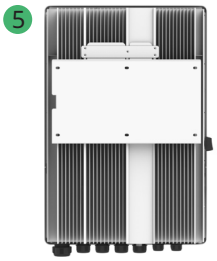
Check List
1. The inverter installation should be protected by shelter from direct sunlight or bad weather such as snow, rain, or lightning. 2. The inverter should be installed on a solid surface that is suitable for the inverter's dimensions and weight. 3. The inverter should be installed vertically or at a maximum back tilt of 15°. Leave enough space around the inverter according to the figure below.  4. The inverter should be installed in an environment with good ventilation and heat dissipation conditions. 5. The ambient temperature should be between -25°C and 45°C. High ambient temperatures will cause power derating of the inverter. 6. The relative humidity should be less than 95%, without condensing. 7. The inverter should be installed at eye level for convenient maintenance. 8. The product label on the inverter should be visible after installation. 9. The inverter should be installed far from flammable materials.

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3.3.2 Mounting Inverter

Install the inverter on the wall using the provided wall-mounting bracket and expansion plug sets.

Procedure	
Step 1&2	• Position the bracket against the wall and mark the 6 drilling hole locations. • Drill holes with a driller, and make sure the holes are deep enough (at least 60 mm).
	
Step 3&4	• Place sleeves in the holes, and then tighten them. • Fix the wall bracket with expansion screws. Please confirm that the bracket is firmly attached to the mounting surface.
	
Step 5&6	• Mount the inverter on the bracket. • Tighten the screw with a torque of 1.4 N·m to secure the bracket and the inverter.
	

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3.4 Electrical Connection

WARNING	• Before any electrical connections, keep in mind that the inverter has dual power supplies. It is mandatory for the qualified personnel to wear personal protective equipment (PPE) during the electrical work.

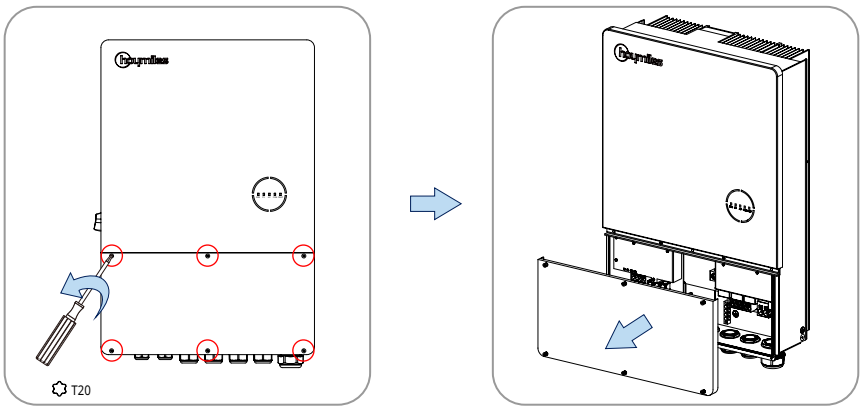
3.4.1 Recommended Cable List

This data is the cable specification recommended by Hoymiles, and for proper cable specification, please refer to local laws and regulations and actual installation.

Cable (90℃/194℉, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
Ground Cable	4 AWG (25 mm^2)	4 AWG (25 mm^2)	4 AWG (25 mm^2)	12-14 mm
PV Cable	10-8 AWG (6-10 mm^2)	10-8 AWG (6-10 mm^2)	10-8 AWG (6-10 mm^2)	13-14 mm
Battery Cable	1/0-2/0 (50-70 mm^2)	2/0-3/0 (70-95 mm^2)	3/0-4/0 (95-120 mm^2)	20-23 mm
GRID L/N Cable	4-2 AWG (25-35 mm^2)	4-2 AWG (25-35 mm^2)	4-2 AWG (25-35 mm^2)	17-18 mm
GRID PE Cable	6 AWG (16 mm^2)	6 AWG (16 mm^2)	6 AWG (16 mm^2)	10-12 mm
EPS L/N/PE Cable	10-8 AWG (6-10 mm^2)	8-6 AWG (10-16 mm^2)	8-6 AWG (10-16 mm^2)	17-18 mm
GEN L/N/PE Cable	10-8 AWG (6-10 mm^2)	8-6 AWG (10-16 mm^2)	8-6 AWG (10-16 mm^2)	17-18 mm
Communication Cable	24 AWG (0.2 mm^2)	24 AWG (0.2 mm^2)	24 AWG (0.2 mm^2)	8 mm

3.4.2 Opening the Wiring Box Cover

Procedure	
Step 1	• Loosen but do not remove the 6 screws of the wiring box cover with T20 screwdriver.
Step 2	• Remove the cover.



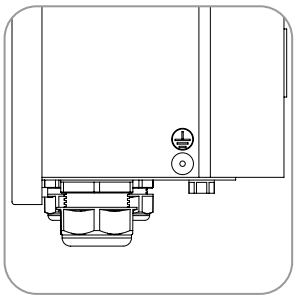
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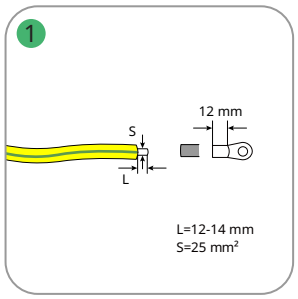
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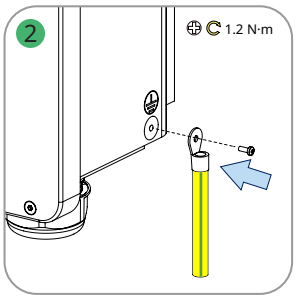
3.4.3 Ground Cable Connection

Cable (90℃/194℉, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
Ground Cable	4 AWG (25 mm²)	4 AWG (25 mm²)	4 AWG (25 mm²)	12-14 mm

Procedure	
Step 1	• Crimp the cable and ground terminal.
Step 2	• Use the screw from the accessory box to fasten the cable with the Phillips screwdriver.







3.4.4 PV Cable Connection

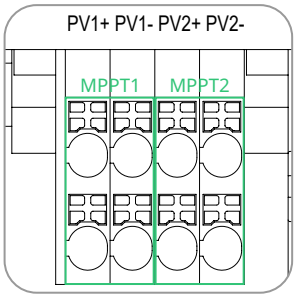
WARNING

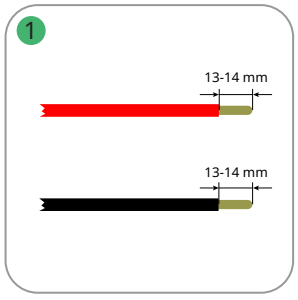
Before connecting the PV cable, please make sure all requirements listed below are followed.

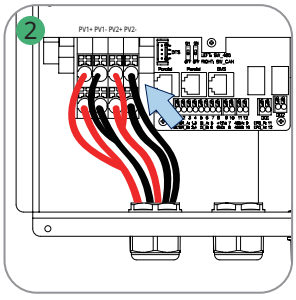
- The voltage, current, and power ratings of the panels to be connected are within the allowable range of the inverter. Ensure the polarity is correct, and please refer to the technical parameters in Chapter 5 for voltage and current limits.
- If the PV cables are reversely connected or if the inverter is not working properly, do not turn off the DC switch. Otherwise, it may cause a DC arc, fire, or damage to the inverter. After the PV input current drops below 0.5 A, disconnect the DC switch and adjust the polarity of the PV strings.
- Since the inverter is a transformerless structure, please do not ground the outputs of PV panels.

Cable (90℃/194℉, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
PV Cable	10-8 AWG (6-10 mm²)	10-8 AWG (6-10 mm²)	10-8 AWG (6-10 mm²)	13-14 mm

Procedure	
Step 1	• Strip the cable insulation by 13-14 mm.
Step 2	• First insert the PV cable into the terminals according to positive and negative polarity, and then gently pull the cables backward to ensure that they are firmly connected.







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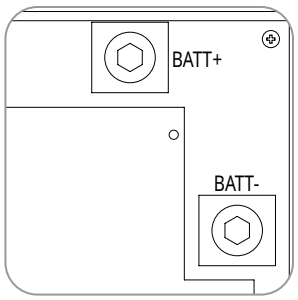
3.4.5 Battery Cable Connection

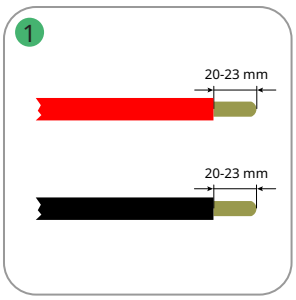
This section mainly describes the cable connections on the inverter side. Refer to the instructions supplied by the battery manufacturer for the connections on the battery side.
For batteries without a built-in DC breaker, make sure that an external DC breaker is connected.
If you need to use this hybrid inverter as a grid-tied inverter, please contact Hoymiles for help.

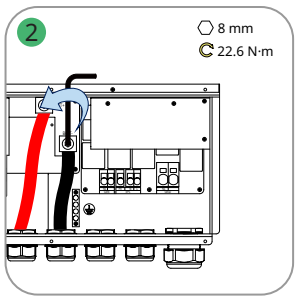
WARNING	• A two-pole DC breaker with an overcurrent protection (OCP) function is compulsory to be installed between the inverter and battery. The battery may have this switch integrated. If not, an external DC switch of proper ratings should be used. • Make sure the breaker mentioned above is in the “OFF” position. • Before proceeding to the next step, make sure that the battery voltage is 0 Vdc through a multimeter.
NOTICE	• Do not turn the battery switch on until all cables are properly connected. • The inverter is compatible with specific batteries. For battery models that this inverter supports, please refer to the Hoymiles compatible battery list.

Cable (90°C/194°F, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
Battery Cable	1/0-2/0 (50-70 mm^2)	2/0-3/0 (70-95 mm^2)	3/0-4/0 (95-120 mm^2)	20-23 mm

Procedure	
Step 1	• Strip the battery cable insulation by 20-23 mm.
Step 2	• Use the hex wrench to unscrew the bolts, insert the battery cables into the terminals, and then tighten the bolts. Gently pull the battery cables backward to ensure that they are firmly connected.







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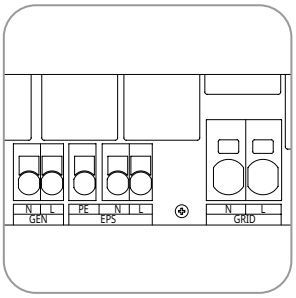
3.4.6 AC Cable Connection

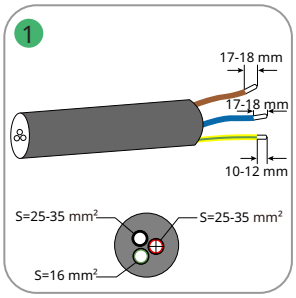
The following diagrams are examples of connecting grid cables. The GEN and EPS connection methods are similar to the grid connection. For the cable specifications of GEN and EPS, please refer to the following cable specification list.

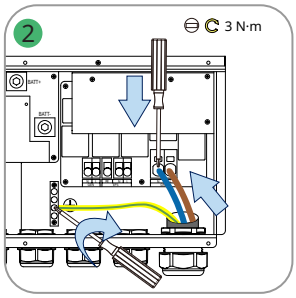
WARNING	Before connecting the AC cables, please make sure all requirements listed below are followed. • An independent one or two circuit breaker must be installed on the output side of the inverter to ensure safe disconnection from the grid. • Multiple inverters cannot share one circuit breaker. • Never connect a load between the inverter and the circuit breaker. • Make sure that the overcurrent protection devices (OCPDs) (breakers) are turned off. • Before proceeding to the next step, make sure that the AC voltages are 0 Vac through a multimeter.

Cable (90℃/194℉, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
GRID L/N Cable	4-2 AWG (25-35 mm^2)	4-2 AWG (25-35 mm^2)	4-2 AWG (25-35 mm^2)	17-18 mm
GRID PE Cable	6 AWG (16 mm^2)	6 AWG (16 mm^2)	6 AWG (16 mm^2)	10-12 mm
EPS L/N/PE Cable	10-8 AWG (6-10 mm^2)	8-6 AWG (10-16 mm^2)	8-6 AWG (10-16 mm^2)	17-18 mm
GEN L/N/PE Cable	10-8 AWG (6-10 mm^2)	8-6 AWG (10-16 mm^2)	8-6 AWG (10-16 mm^2)	17-18 mm

Procedure	
Step 1	• Strip the grid L/N cable insulation by 17-18 mm. • Strip the grid PE cable insulation by 10-12 mm.
Step 2	• Firstly, use the slotted screwdriver to unscrew the screw on the grounding bar, insert the grid PE cable, and tighten the screw. Secondly, insert the slotted screwdriver into the terminal to press down the leaf spring, insert the L/N cable into the grid terminals, and then remove the screwdriver. Gently pull the grid L/N/PE cables backward to ensure that they are firmly connected.



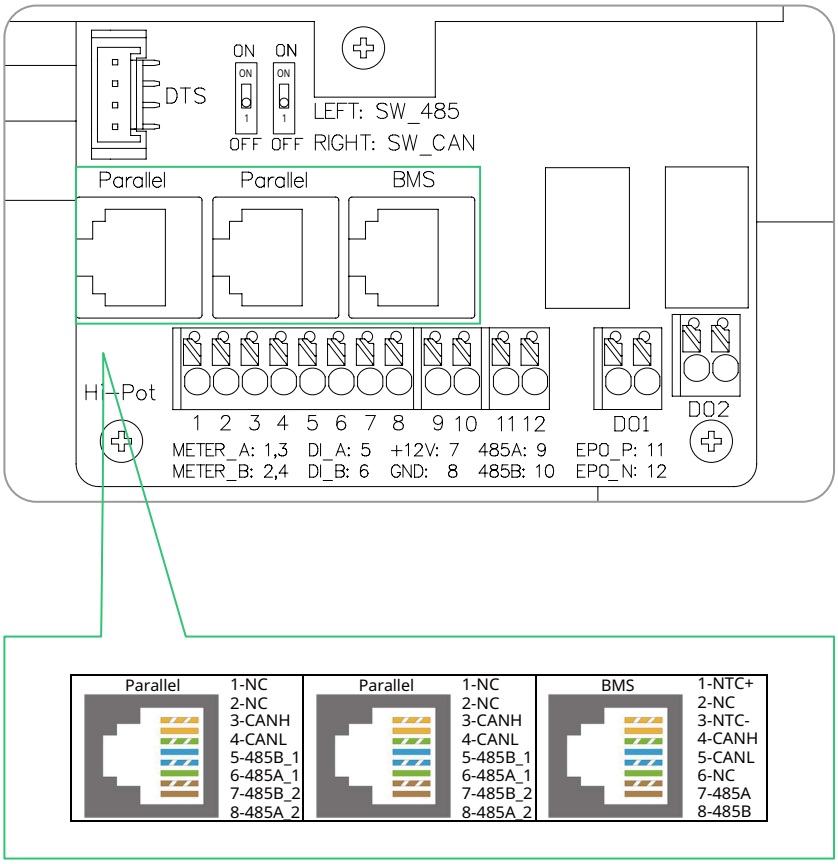




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3.4.7 Communication Cable Connection

Detailed pin functions of each port on the communication interface are as follows.



Label	Description
Parallel (CANH, CANL, 485B_1, 485A_1, 485B_2, 485A_2)	For parallel operation.
BMS (NTC+, NTC-, CANH, CANL, 485A, 485B)	For Li-ion batteries, communication is via CAN. For lead-acid batteries, the temperature is monitored via a sensor through NTC+ and NTC-.
SW_485 (ON, OFF)	120 Ohm termination resistor for parallel operation.
SW_CAN (ON, OFF)	120 Ohm termination resistor for parallel operation.
Meter (485A1, 485B1, 485A2, 485B2)	For the smart meter. One is connected to the grid side, and the other is connected to the third-party inverter.
DI (DI_A, DI_B)	Dry contact input of external bypass contactor.
+12V / GND	Reserved.
EPO_P / EPO_N	For external Emergency Power Off switch.
DO1 (NO1, COM1)	Dry contact output. The DO1 can be set to one of the functions as follows: Earth Fault Alarm, Load Control, and Generator Control.
DO2 (NO2, COM2)	Dry contact output. The DO2 will control the bypass contactor under certain logic.

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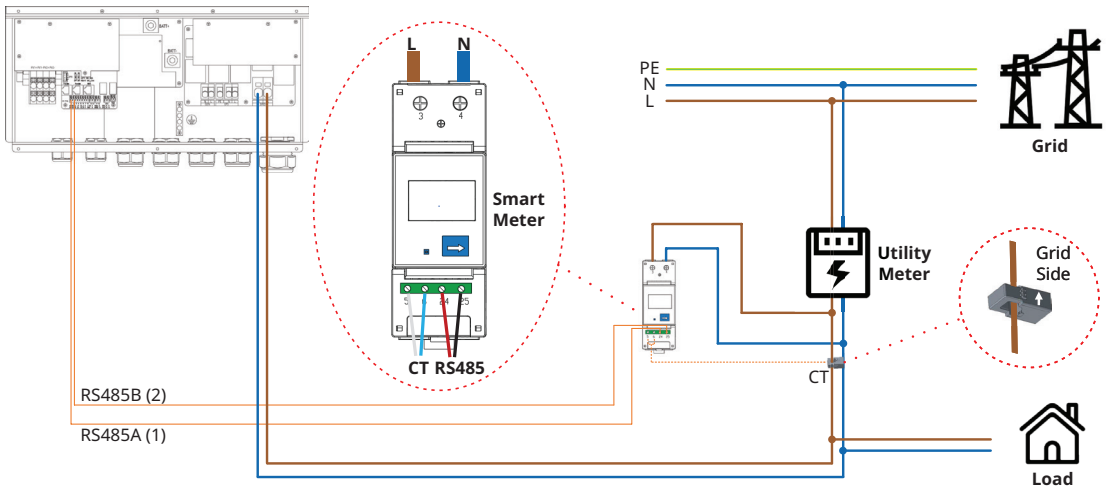
3.4.7.1 Smart Meter and CT Connection

The smart meter and CT in the accessory box are necessary for system installation and are used to provide the operating condition of the inverter via RS485 communication.

WARNING	• Before connecting the smart meter and CT, ensure that the AC cable is totally isolated from the AC power source.
NOTICE	• One smart meter can be used with only one inverter. • One CT must be used for one smart meter and must be connected to the same phase with the smart meter power cable. • There is a symbol (arrow) or label on the surface of CT that indicates the correct mechanical orientation of the CT on the conductor under measurement. Please identify the arrow or label before installing the CT. • The communication cable should be a standard CAT 5 Ethernet cable.

Cable (90℃/194℉, Copper)	Specification			Stripping Length
	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2	HYS-8.0/10.0/12.0LV-EUG2
Communication Cable	24 AWG (0.2 mm^2)	24 AWG (0.2 mm^2)	24 AWG (0.2 mm^2)	8 mm

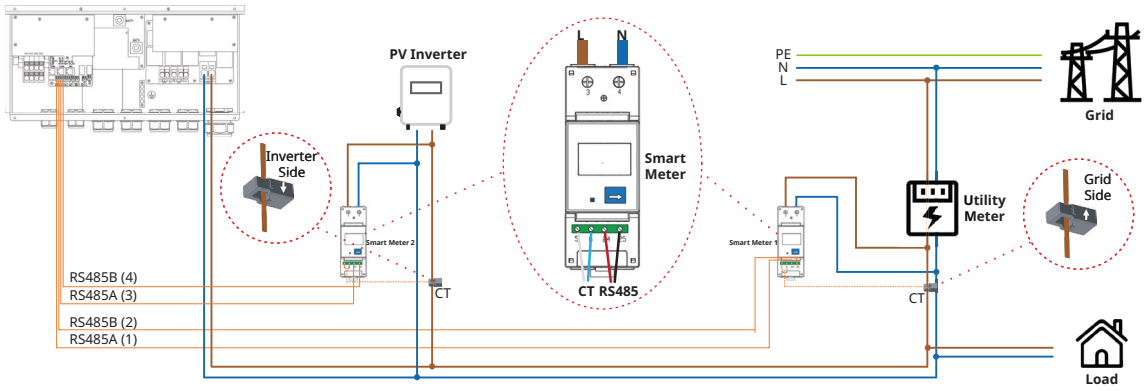
Procedure (Hybird System)	
Step 1	• Clamp CT to the L wire, respectively connect the white and blue wire of CT to terminals 5/6. The arrow on the surface of CT should point to the grid.
Step 2	• Connect grid L/N to meter's terminals 3/4.
Step 3	• Connect meter's terminals 24/25 to inverter METER_A (1) and METER_B (2).



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Procedure (AC Coupled System)	
Step 1	• The connection method of smart meter 1 is the same as that described above. The arrow on the surface of CT should point to the grid.
Step 2	• If the PV inverter is connected to the GRID port, smart meter 2 should be connected. Connect terminals 3/4 to PV inverter L/N, and connect terminals 24/25 to inverter METER_A (3) and METER_B (4). The arrow on the surface of CT should point to the opposite direction of the PV inverter.



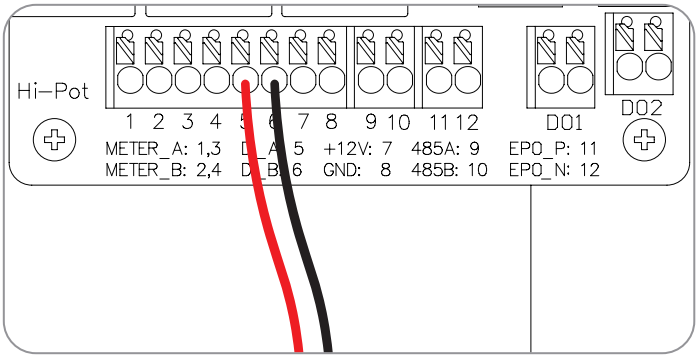
Note:

- There is one smart meter in our packing box, and the other needs to be purchased from Hoymiles.
- The meter address is automatically set. If there are meter communication problems, please check if the address of the PV side meter is set to 001, and the address of the grid side meter is set to 002.

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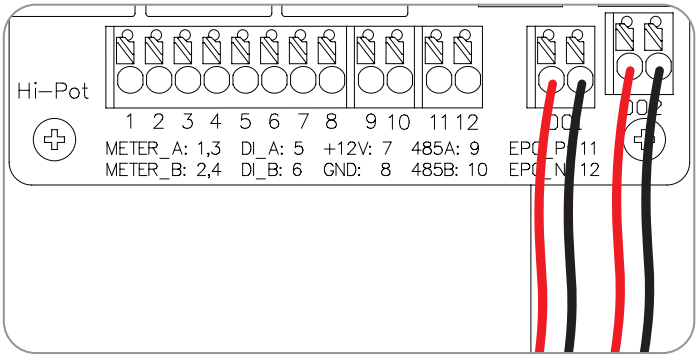
3.4.7.2 DI Connection

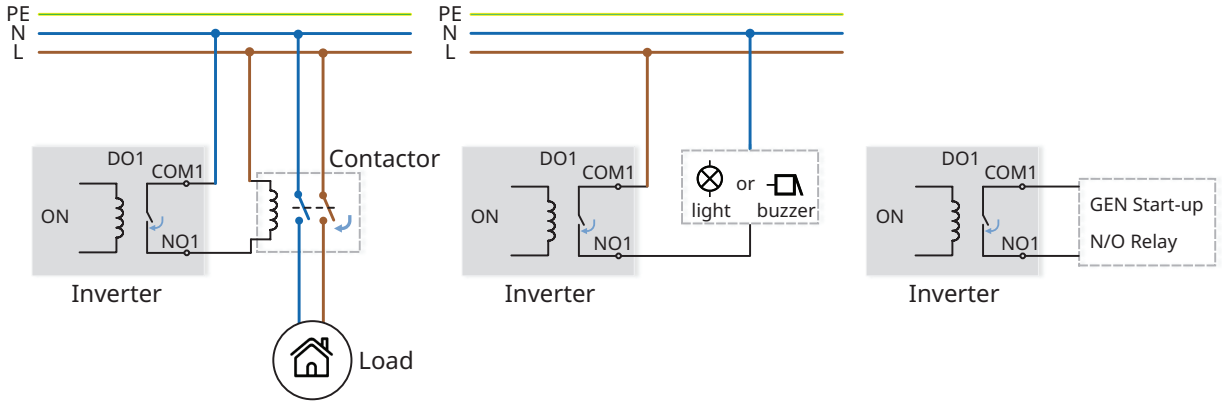
There is an integrated DI (DI_A, DI_B) as the dry contact input to the bypass contactor of the inverter.



3.4.7.3 DO Connection

The inverter has integrated a multiple-function dry contact (DO1 and DO2). The DO1 can be set to one of the functions as follows, Earth Fault Alarm, Load Control, and Generator Control. The DO2 can control the external bypass contactor if installed.





DO1-Load Control DO1-Earth Fault Alarm DO1-Generator Control

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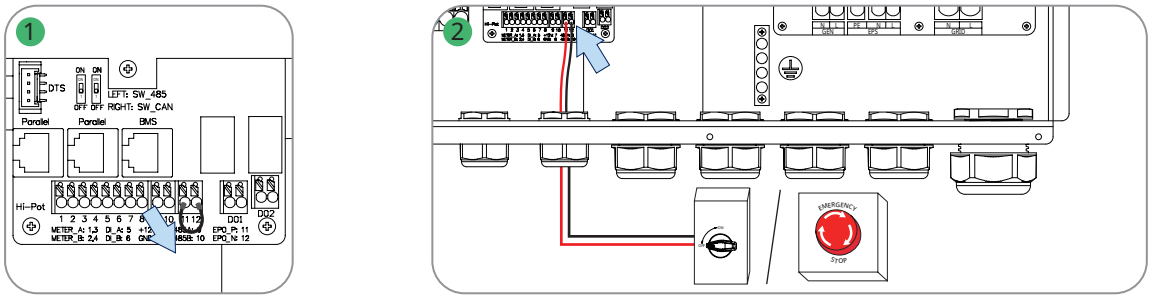
3.4.7.4 External Emergency Power Off Switch Connection (Optional)

An external Emergency Power Off (EPO) switch can be installed to shut down the system in case of emergency if needed.

The external EPO switch is not provided by Hoymiles and should be purchased separately. It must meet the requirements as follows,

- An ON/OFF position and an ON/OFF position indicator;
- A protection degree of NEMA 3R or above;
- The installation location should be readily accessible.

Procedure	
Step 1	• Remove the jumper wires between EPO_P and EPO_N.
Step 2	• Connect one end of the positive and negative wires to the EPO_P and EPO_N terminals, and connect the other end to the external EPO switch.



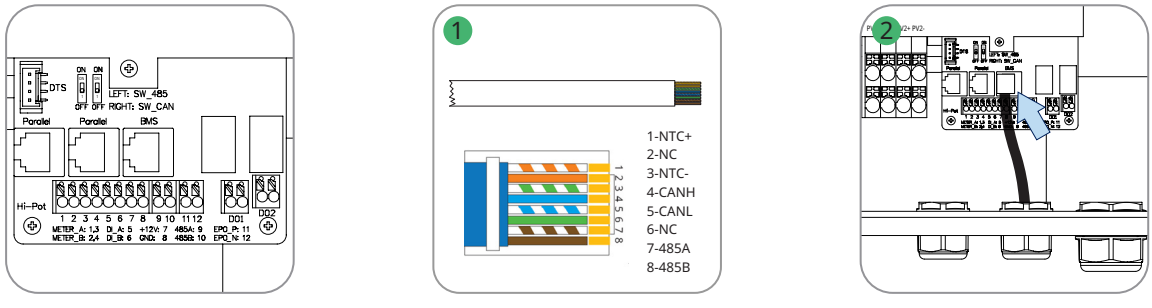
Note:

If an external Emergency Power Off switch is not needed, please do not remove the jumper wires.

3.4.7.5 BMS Connection

BMS is used to communicate with compatible Li-ion batteries. Note that the communication cable should be a standard CAT 5 Ethernet cable. If the lead-acid battery is used to work with this inverter, the battery temperature sensor in the packing list shall be used to monitor the battery temperature.

Procedure	
Step 1	• Strip the communication cable insulation with an ethernet wire stripper, and lead the corresponding signal cables out. Insert the signal cables into the RJ45 plug in the correct order, and crimp it with a network cable crimper.
Step 2	• Insert the RJ45 plug into the BMS port, and gently pull the cable backward to make sure that the plug is completely connected to the BMS port. The pin definition of BMS or battery temperature sensor is shown in the “3.4.7 Communication Cable Connection”.

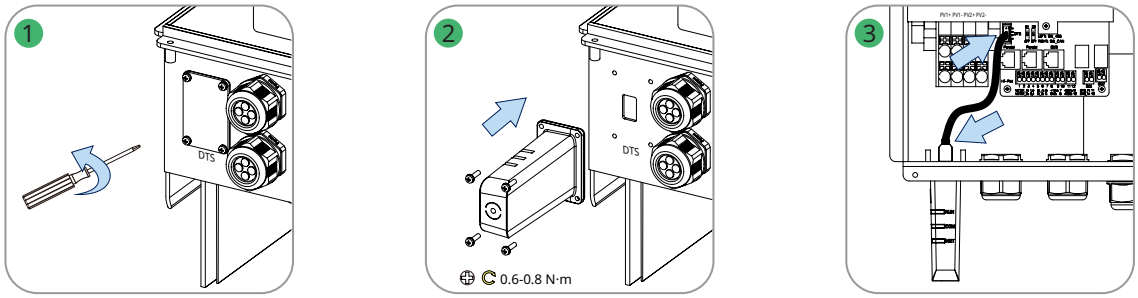


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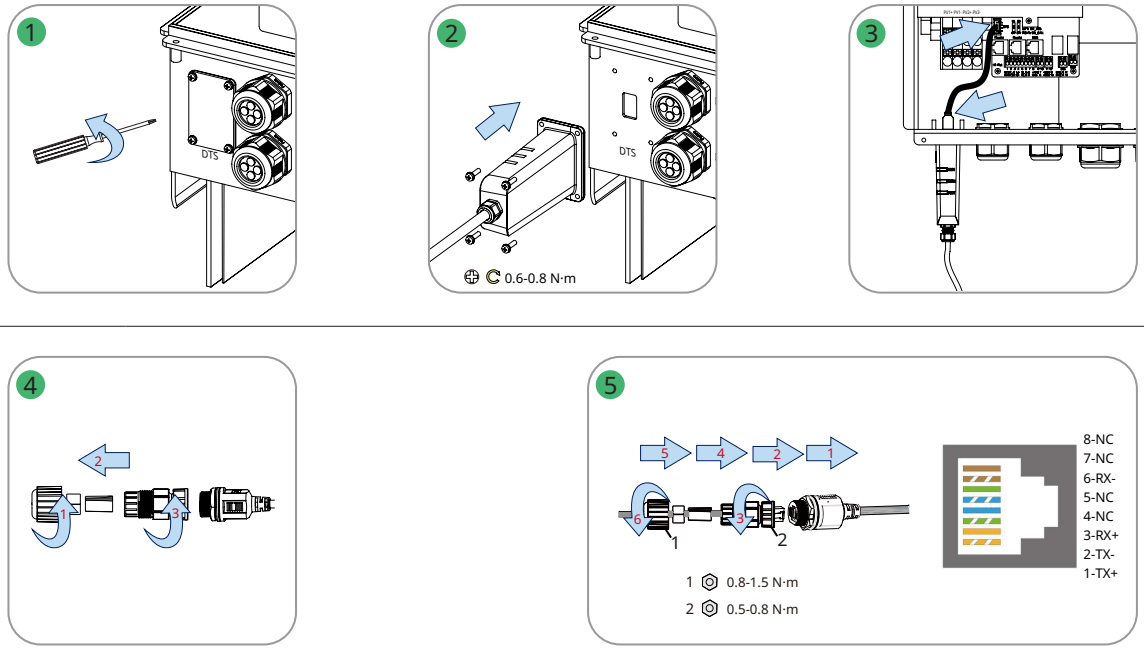
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3.4.8 DTS Connection

DTS-Wi-Fi-G1 Procedure	
Step 1	• Remove the DTS port cover plate.
Step 2	• Insert the DTS into the DTS port, and tighten the screws.
Step 3	• Respectively connect the ends of the DTS connecting line to the corresponding ports.



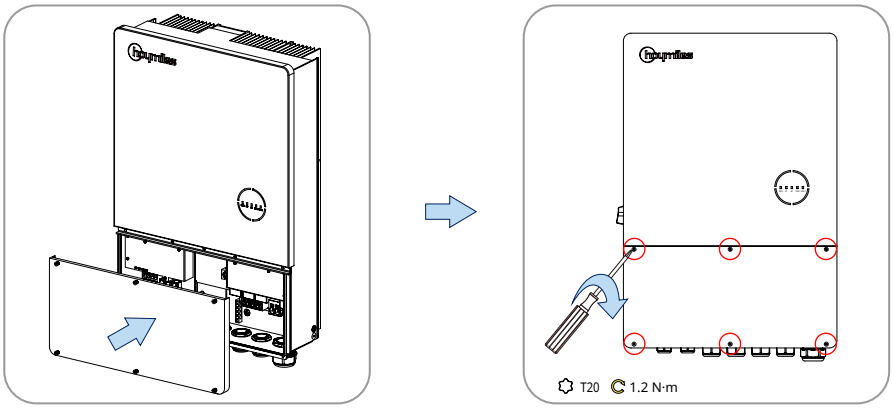
DTS-Ethernet-G1 Procedure	
Step 1&2	• Remove the DTS port cover plate. • Insert the DTS-Ethernet into the DTS port, and tighten the screws.
Step 3&4	• Respectively connect the ends of the DTS connecting line to the corresponding ports. • Unscrew the swivel nut from the connector.
Step 5	• Insert the RJ45 plug (pin definition is shown below) into the connector until there is an audible click sound. (Note that the RJ45 plug with cable sheath cannot be inserted.) • Thread the cable of an appropriate length through the connector. • Tighten the cable gland.



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Indicator	Status	Description
RUN	ON	DTS is powered on.
	OFF	DTS is not powered on.
COM	ON	Proper communication with the inverter.
	OFF	Improper communication with the inverter.
NET	ON	Proper communication with S-Miles Cloud.
	OFF	Improper communication with S-Miles Cloud.
	BLINK	Improper communication with S-Miles Cloud, but the network is connected.

3.4.9 Installing the Wiring Box Cover

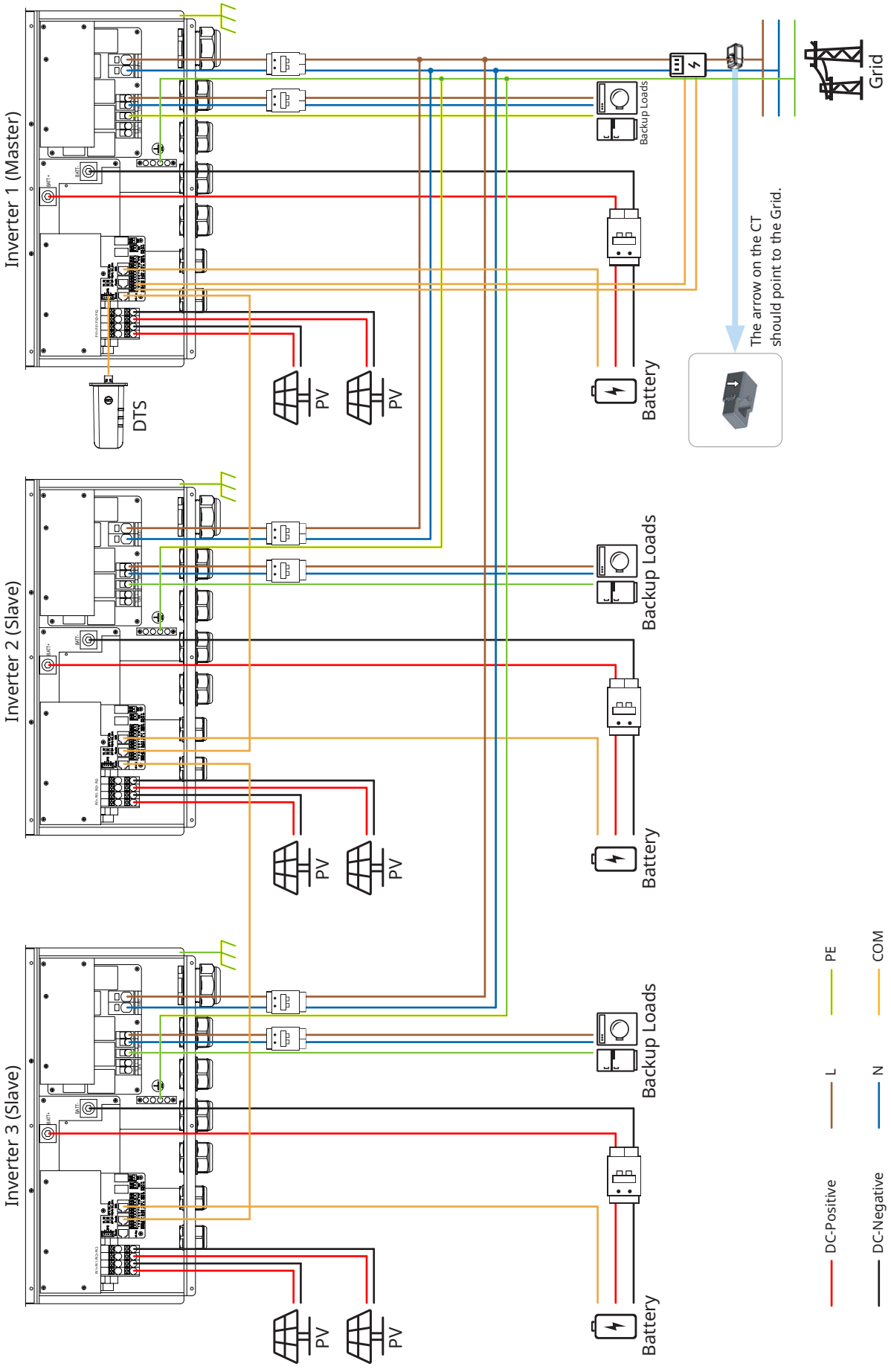
Procedure
• After the cables are firmly and correctly connected, install the wiring box cover with a T20 screwdriver.


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3.4.10 Parallel Connection

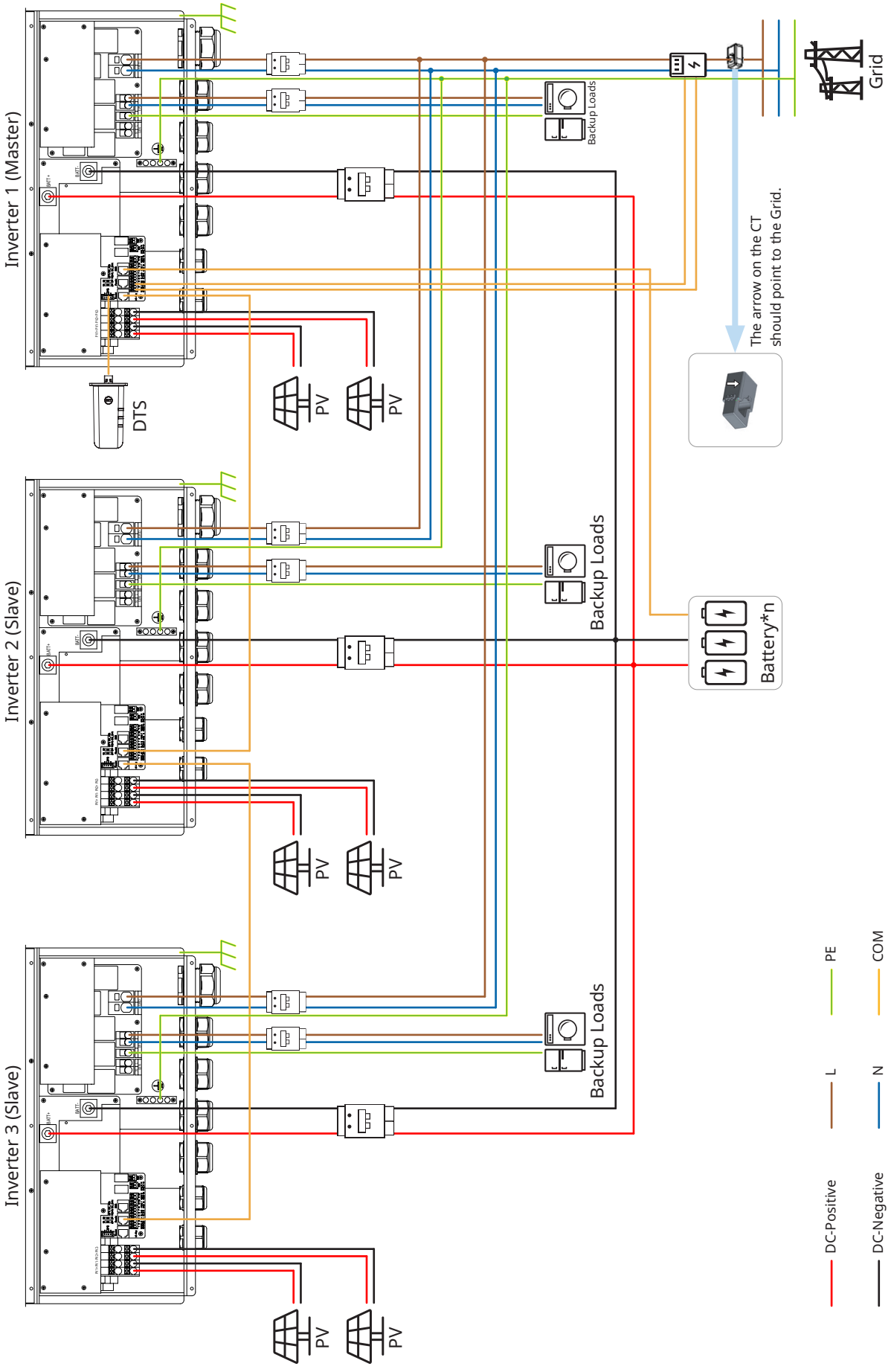
Diagram 1



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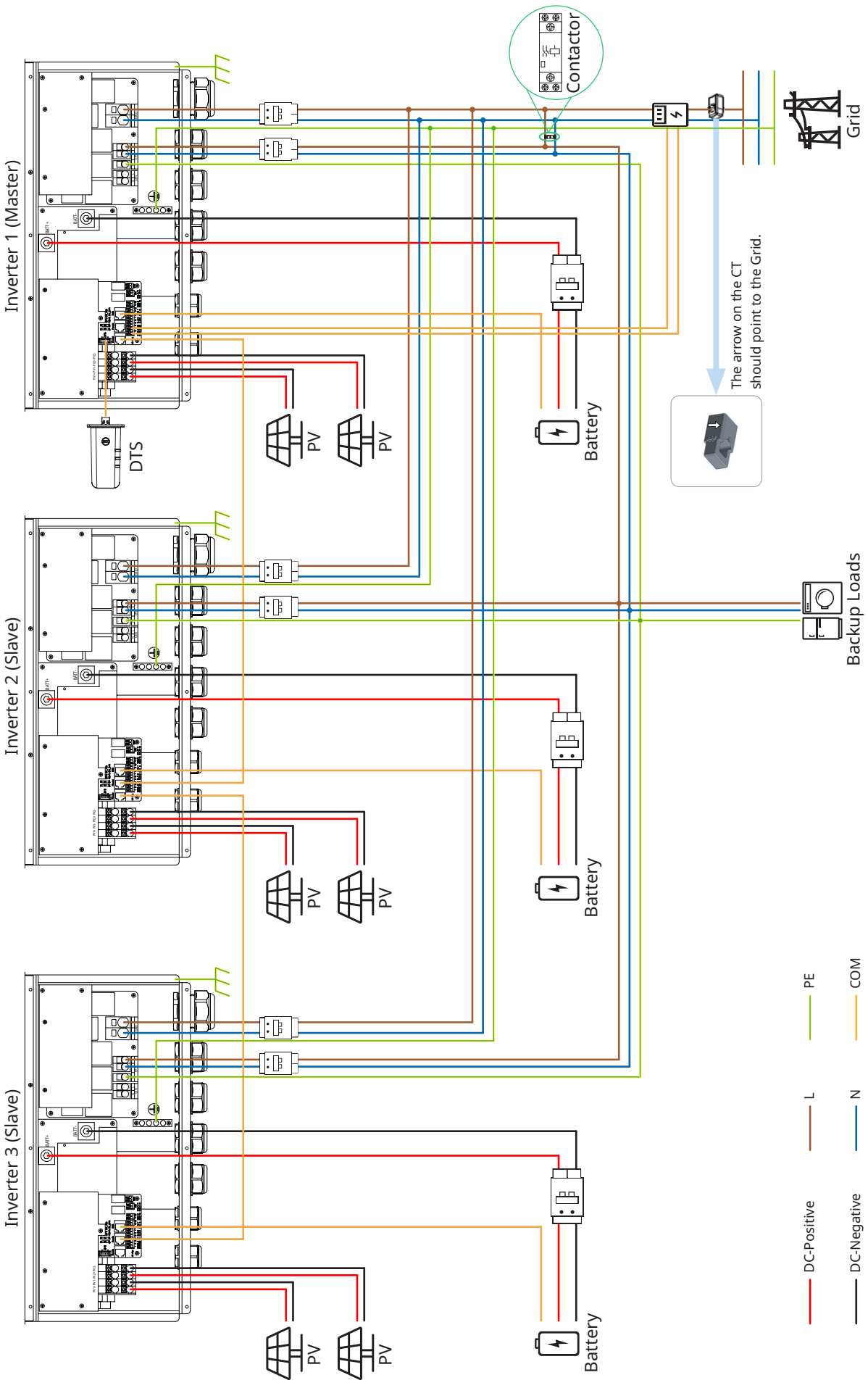
Diagram 2



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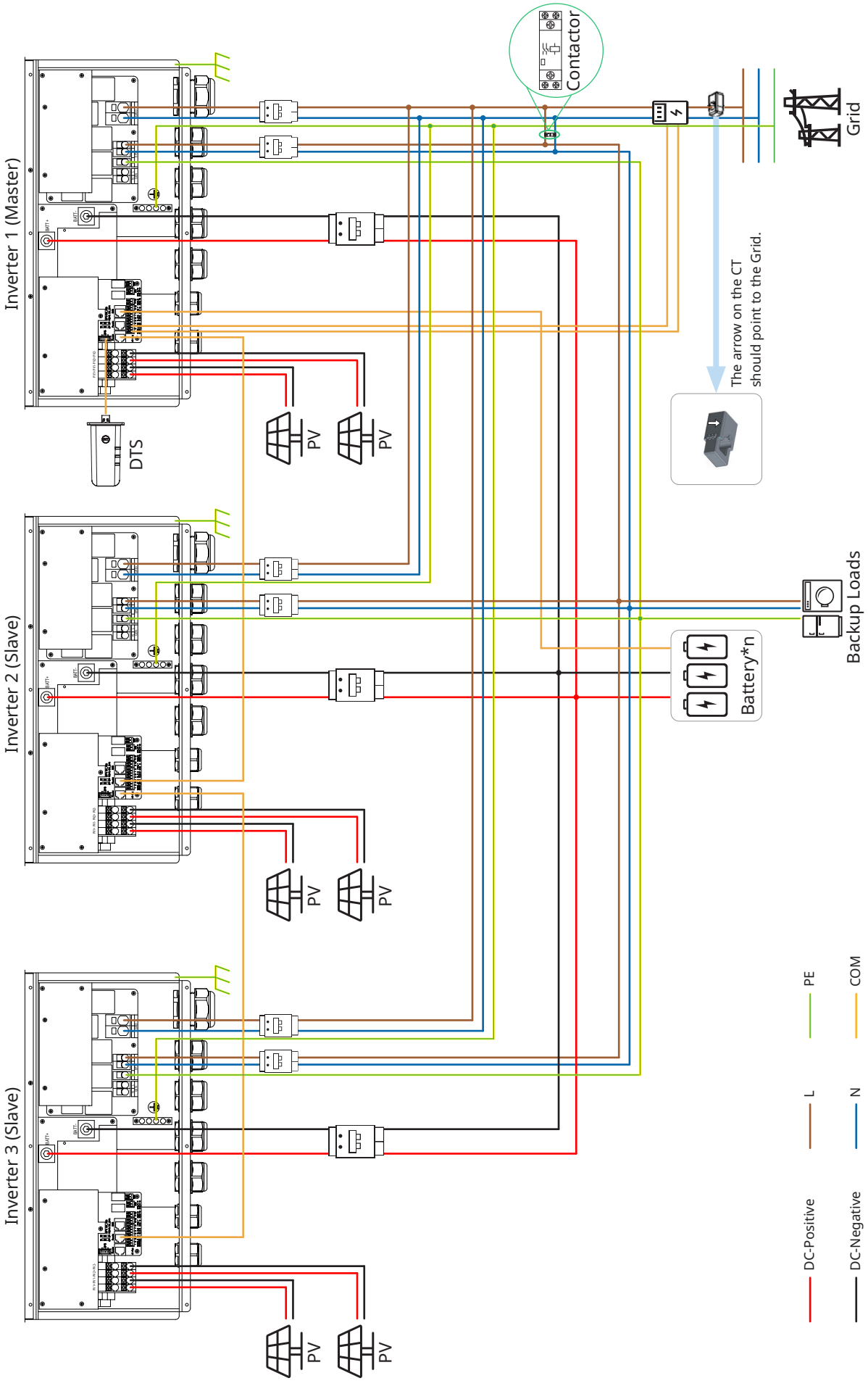
Diagram 3



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Diagram 4

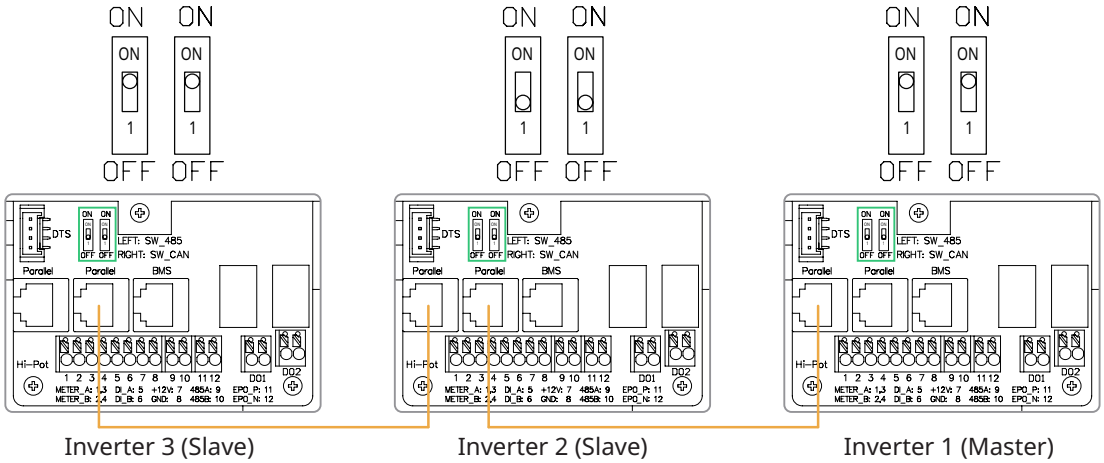


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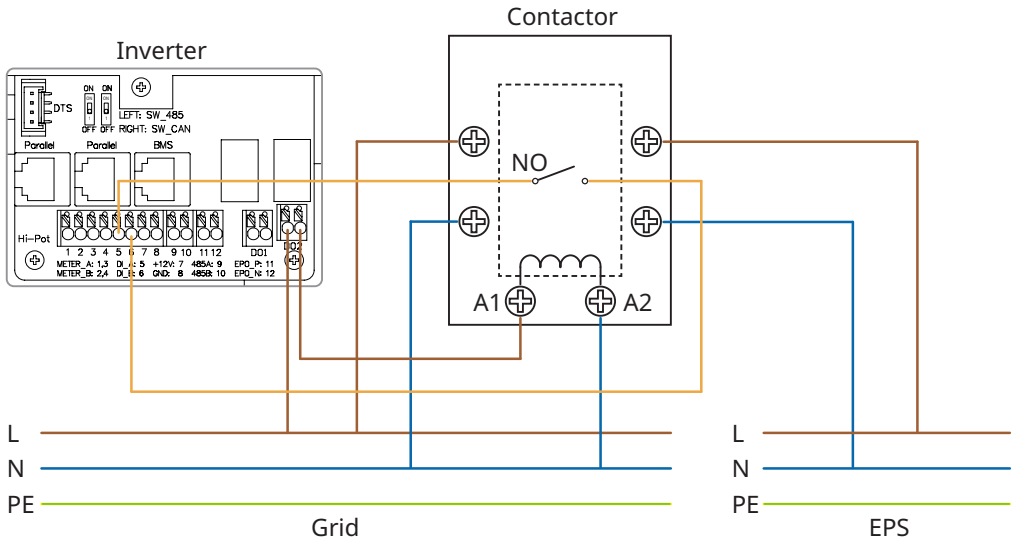
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Note:

- As shown in the figure, parallel operation is performed through the parallel interface. When inverters are used in parallel, the first and the last inverters are “ON”, and the others are “OFF”.



- Up to 10 inverters in parallel.
- The DTS must be connected to the Master.
- The ARM version must be V2.03.05 and above, the DSP-Power version must be V1.01.12 and above, and the DSP-Safety version must be V1.01.06 and above.
- This series of inverters works with or without battery.
- For detailes about parallel settings and battery settings, please refer to “3.5.3.2 System Commissioning of Wireless Access Point (AP) Connection”.
- This series of inverters with different powers can be connected in parallel.
- If the grid side current exceeds 100 A, the smart meter and CT (100 A) provided by Hoymiles will not be able to meet the current requirement. If you need other models with larger current to replace them, please contact Hoymiles sales.
- The PV inverter can be connected to the grid side. If power export management is required, the power of the PV inverter shall be less than the battery charge power. The zero-export function will be disabled after the battery is fully charged.
- For diagrams 3 and 4, the external bypass switch must be enabled using the S-Miles App. Detailed operation instructions are shown in “3.5.3.2 System Commissioning of Wireless Access Point (AP) Connection”
- For diagrams 3 and 4, please select a normally open contactor, connect it to the DI and DO2 ports of the inverter, and connect the auxiliary power supply of the contactor to the grid side. Meanwhile, select the appropriate contactor based on the actual loads. The contactor connection method is shown as follows.



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3.5 Operation

3.5.1 Commissioning

 NOTICE	Before the commissioning of the inverter, make sure: • The inverter DC switch and external circuit breaker are disconnected; • Check wiring according to "3.4 Electrical Connection"; • Check whether the grid voltage is within the permissible range through the multimeter before turning on the AC switch; • Unused terminals must be sealed using corresponding sealing plugs; • Nothing is left on the top of the inverter and battery; • Cables are routed in a safe place or protected against mechanical damage; • Warning signs and labels are intact.

System Power-on Procedure	
Step 1	If the inverter is connected to the battery, turn on the battery power switch and DC breaker.
Step 2	Turn on the AC breaker between the inverter and the grid.
Step 3	Rotate the DC switch to "ON" if the inverter is connected to the PV strings.
Step 4	Check whether the inverter is operating properly through the inverter indicators status.

3.5.2 Decommissioning

 NOTICE	After powering off the inverter, follow the steps below if needed: • Wait at least 5 minutes after the LED indicators turn off to release the internal energy; • Disconnect all cables; • Remove DTS and power meter; • Remove the inverter from the wall, and remove the bracket if necessary, and finally pack the inverter and accessories; Please strictly follow the procedure below. Otherwise, it will cause lethal voltages or unrecoverable damage to the inverter.

System Power-off Procedure	
Step 1	Stop the inverter from working via the Hoymiles App.
Step 2	Disconnect the AC breaker between the inverter and the grid.
Step 3	Rotate the DC switch to "OFF" if the inverter is connected to the PV strings.
Step 4	Turn off the DC breaker between the inverter and the battery.
Step 5	Check whether the inverter indicators are off.

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3.5.3 S-Miles Cloud App

The S-Miles Cloud App has been developed for Hoymiles inverter and offers the following features:

a. Network configuration;

b. Local installation assistant;

c. System monitoring.

Please download the S-Miles Cloud App from the Google Play Store or the Apple App Store. The QR code below can also be scanned to download the App. Please refer to the S-Miles Cloud User Manual from www.hoymiles.com/resources/download/ for details.

S-Miles Installer

S-Miles End-user

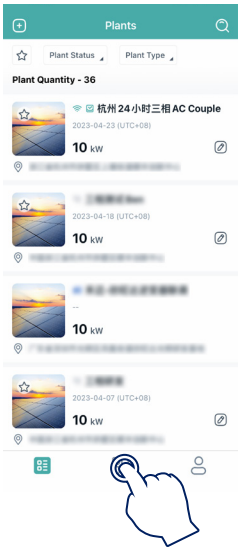
3.5.3.1 DTS Online Setting

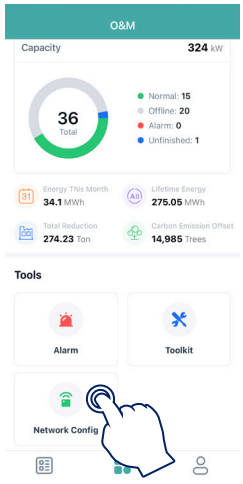
1. Search “Hoymiles” in the App Store (iOS) or the Play Store (Android), or scan the QR code to download the Hoymiles Installer App.

2. Open the app and log in with your installer account and password. For new Hoymiles installers, please apply for an installer account from your distributor in advance.

3. Use the App to connect to the DTS.

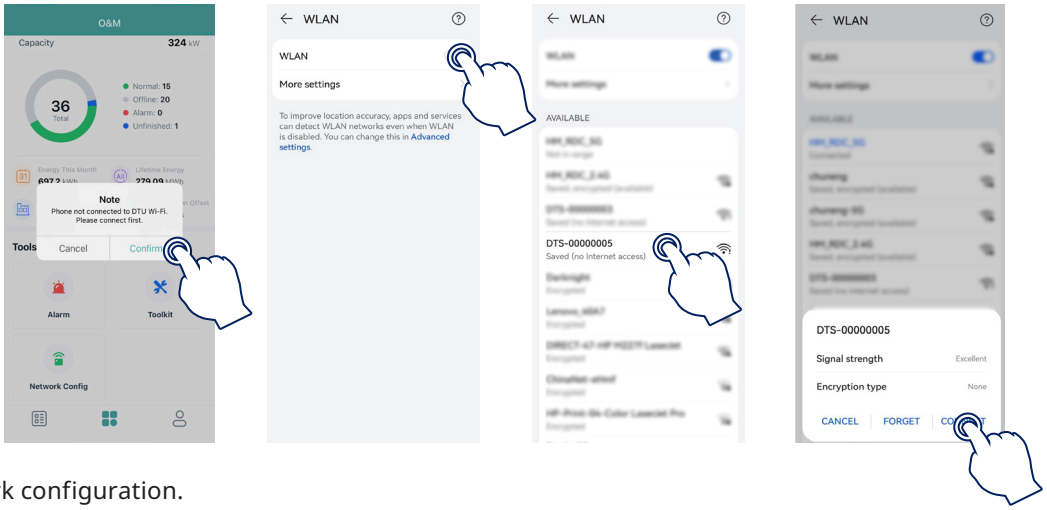
(a) Open the Installer App on smartphone/tablet and log in. Tap on “O&M” at the bottom of the page, and then tap on “Network Config”.





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(b) Select the DTS's wireless network and tap "Connect". (The network name consists of DTS and the last 8 digits of the product serial number, and the default password is ESS12345.)

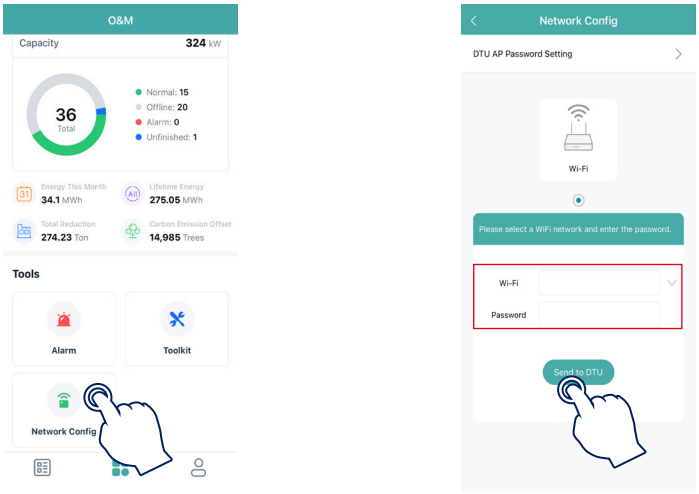


4. Network configuration.

(a) Upon successful connection, tap on "Network Config" again and access the Network Configuration page.

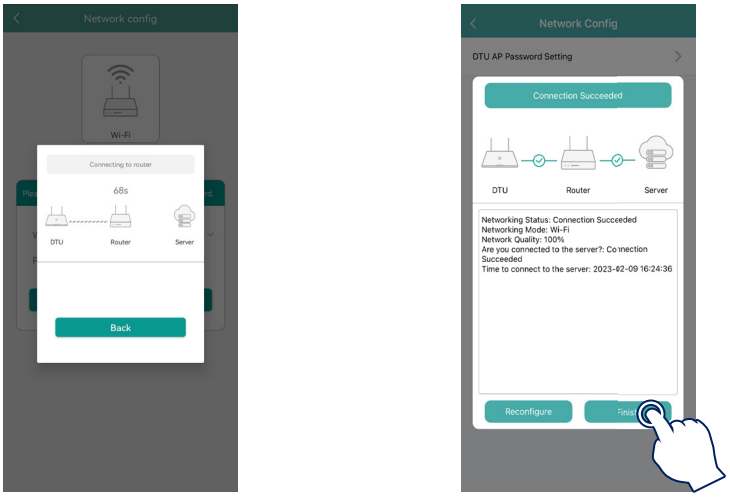
(b) Select the router Wi-Fi and enter the password.

(c) Tap on "Send to DTU".



5. Check the DTS indicator for a solid blue light, which signifies a successful connection.

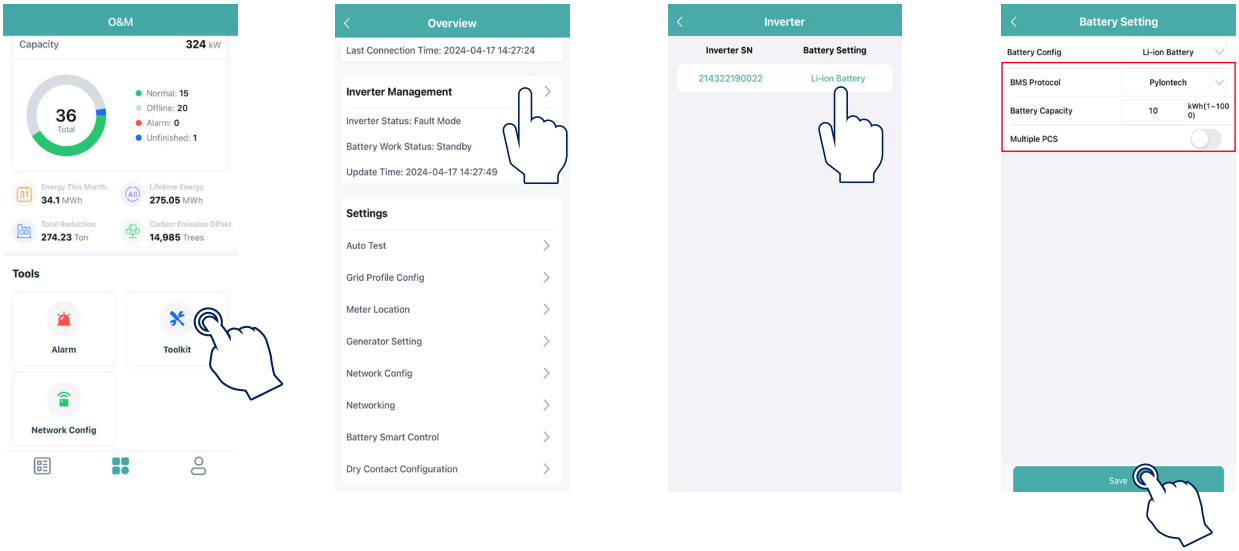
The network configuration takes about 1 minute, please be patient. If the network is not connected, please check the internet as instructed.



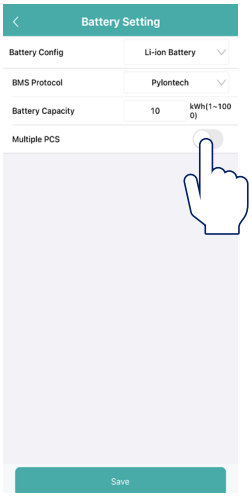
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3.5.3.2 System Commissioning of Wireless Access Point (AP) Connection

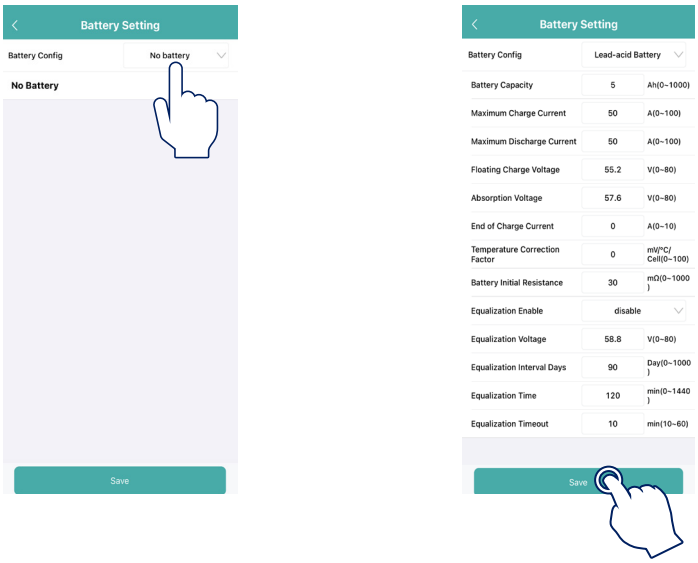
1. Connect the wireless network of DTU. Open the App, tap “Toolkit → Inverter Management → Battery Setting” to set battery type, BMS protocol, and battery capacity, and tap “Save”. (The default setting is “No battery”.)



(a) If Li-ion batteries are connected as shown in diagrams 2 and 4 in “3.4.10 Parallel Connection”, enable “Multiple PCS”.



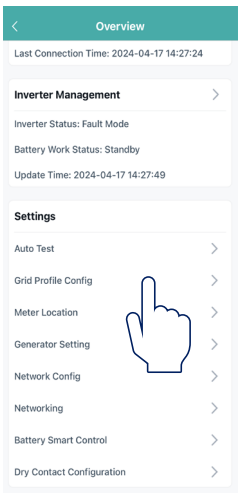
(b) If lead-acid batteries are connected, tap “Battery Config → Lead-acid Battery” to configure relevant parameters. Detailed parameters are shown as follows.

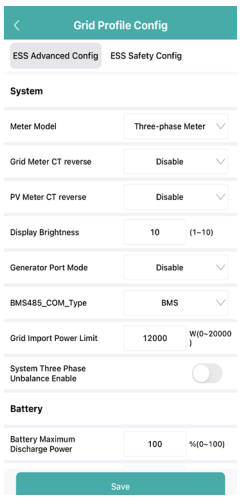


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Parameter	Description	Default Value
Battery Capacity	Enter the battery capacity.	5 Ah
Maximum Charge Current	Set the maximum charge current.	50 A
Maximum Discharge Current	Set the maximum discharge current.	50 A
Floating Charge Voltage	The battery will be charged at this voltage to supplement the self-discharge of the battery.	55.2 V
Absorption Voltage	Set the voltage of absorption charging stage.	57.6 V
End of Charge Current	Set the end of charge current.	0 A
Temperature Correction Factor	Set the temperature correction factor.	0 mV/°C/Cell
Battery Initial Resistance	Set the battery initial resistance.	30 mΩ
Equalization Enable	Regularly enable the equalization to improve battery life.	disable
Equalization Voltage	Set the equalization voltage.	58.8 V
Equalization Interval Days	The equalization will be regularly enabled according to this set value.	90 d
Equalization Time	The time the battery takes for equalization each time.	120 min
Equalization Timeout	Set the equalization timeout.	10 min

2. Tap “Grid Profile Config → ESS Advanced Config” to configure relevant parameters of the system, battery, emergency power supply (EPS), and generator, and tap “Save”.





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★ System

Parameter	Description	Default Value
Meter Model	For single-phase inverter, please choose “Single-phase Meter” or “Three-phase Meter”; For three-phase inverter, please choose “Three-phase Meter”; For inverter used in North America, please choose “Two-phase Meter”.	No Meter
Display Brightness	The brightness of the machine display lamp.	10
Generator Port Mode	After the generator port is connected to the PV inverter or generator, choose the corresponding option.	Disable
BMS485_COM_Type	Communication type includes BMS485 and DTU Com. If the RS485 port is connected to the battery, please choose BMS485; if the RS485 port is connected to the microinverter DTU, please choose DTU.COM.	BMS
Grid Import Power Limit	Limit the charging power of the grid to the battery. The power input limit must not exceed the inverter power.	The default value is set according to the inverter type.
System Three-phase Unbalance Enable	When the loads of the three-phase inverter are not balanced, enable the system three-phase unbalance function. It can compensate for each load.	Disable

★ Battery

Parameter	Description	Default Value
Battery Maximum Discharge Power	Set the maximum discharge power.	100%
Battery Maximum Charge Power	Set the maximum charge power.	100%
Battery Maximum SOC	Set the maximum battery capacity as recommended by the battery manufacturer.	90%
Battery Minimum SOC	Set the minimum battery capacity as recommended by the battery manufacturer.	10%
Battery Supplementary Power	When the battery emergency charging is enabled, or the battery capacity falls below the minimum battery SOC, the battery charge will be triggered.	200 W
Reserved SOC Supplementary Power	Set the percentage of reserved SOC supplementary power. (When the battery SOC falls below the reserved SOC, the battery will be charged at this percentage.)	10%

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Battery Grid Feed Power in Peak Time	Set the percentage of battery feed-in power in peak time.	100%
Bat Discharge Power in Partial Peak Time	Set the percentage of battery discharge power in partial peak time.	100%
MPPT Global Scan Enable	If the PV modules are shaded, enable this function.	Disable

★ Emergency Power Supply (EPS)

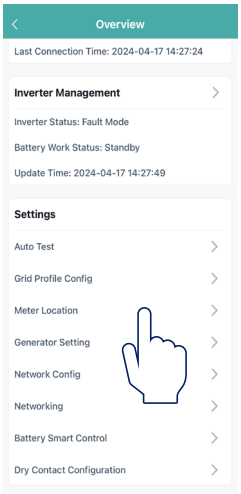
Parameter	Description	Default Value
EPS Mode	When the EPS port is connected, you can choose “EPS” or “UPS”. You can choose “UPS” when the load keeps power on, and the on-grid mode and off-grid mode will automatically switch to each other under UPS mode.	EPS
	EPS is characterized by the continuous power supply, which means that the loads are powered by bypass under normal power supply, and the DC power will be inverted to supply the loads during a power outage, maximizing energy utilization.	
	UPS is a kind of uninterrupted power supply which has stable voltage and frequency, and has an extremely high requirement for switching time. UPS not only operates during a power outage, but also can output high quality power supply to ensure normal operation of electric equipment when such abnormal situations of power supply as overvoltage, undervoltage, and surge occur.	
	When the inverter is used as a PV inverter, choose “Disable”.	
External Bypass Switch	For inverters with an external ATS (EPS) Box, when the external bypass switch is enabled, the inverter EPS port works in the off-grid mode and will not work in the on-grid mode.	Disable
PV Off-grid Mode Enable	In off-grid mode, PV can also operate without the battery. (Under this mode, the system is unstable, so this function is not recommended.)	Disable

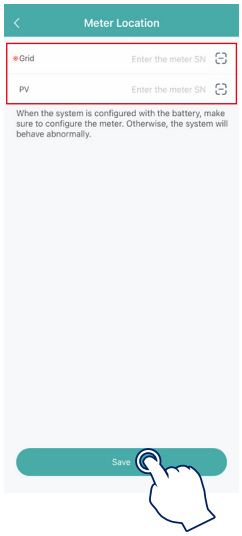
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★ Generator Setting

Parameter	Range	Default Value
Generator Position	None/GenSide	None
Generator Signal Type	Manual/DI/DO	Manual
Generator Minimum Run Time	5-60 min	10 min
Generator Maximum Run Time	6-10 hr	8 hr
Generator Protection Interval	5-60 min	10 min
Generator Synchronized Time	1-20 min	5 min
Generator Shutdown Delay	1-20 min	5 min
Generator Exercise Mode Interval	1-65 d	30 d
Generator Rated Max Power	0-20000 W	/
Generator High Voltage Limit	0-280 V	/
Generator Low Voltage Limit	0-180 V	/
Generator High Frequency Limit	0-70 Hz	/
Generator Low Frequency Limit	0-59 Hz	/

3. Tap “Meter Location” to configure the grid side meter. The serial number (SN) can be entered manually or identified through scanning the barcode. If the GEN port is connected to the PV inverter, the PV side meter also needs to be configured.

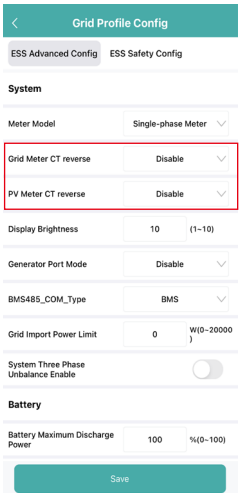


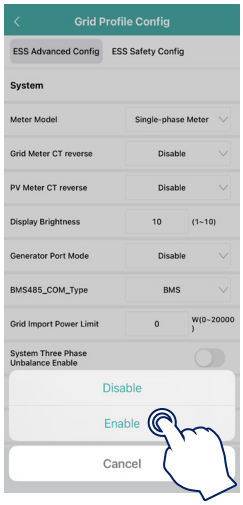


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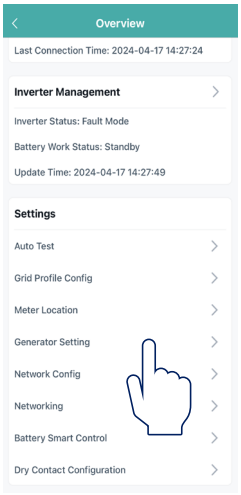
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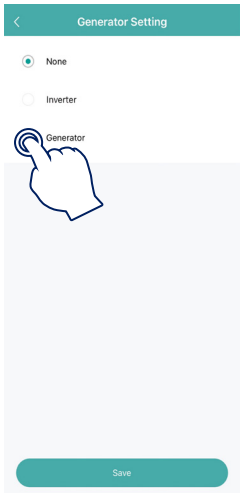
Check whether the direction of CT is correct. If the CT is reversely connected, tap “Grid Profile Config → Grid Meter CT reverse → Enable” or “PV Meter CT reverse → Enable” to get the correct sampling current, and tap “Save”.



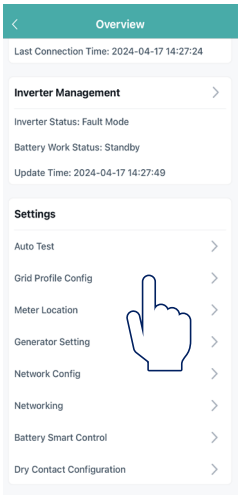


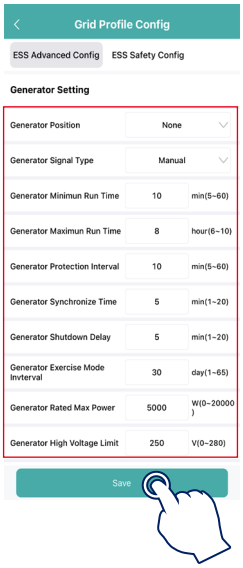
4. Tap “Generator Setting”, choose the corresponding option according to whether the device connected to the GEN port is “Inverter” or “Generator”, and tap “Save”. (The default option is “None”.)





(a) If the GEN port is connected to the generator, tap “Grid Profile Config → ESS Advanced Config”, slide your finger up to set generator parameters, and tap “Save”. For detailed parameters, please refer to NO.2 Generator Setting.

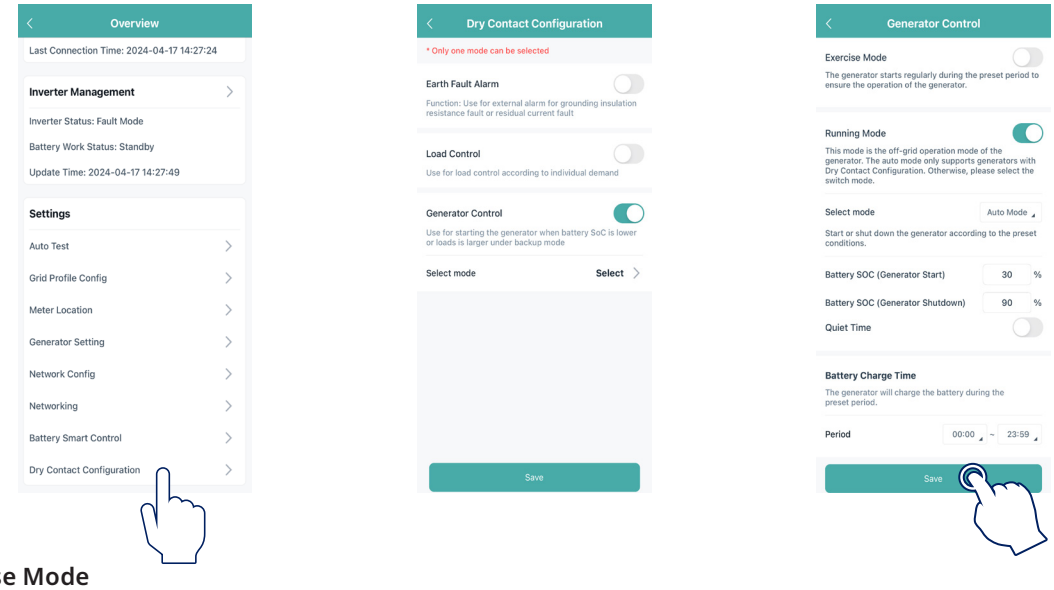




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After setting the generator parameters, tap “Dry Contact Configuration → Generator Control” to set its mode and corresponding parameters, and tap “Save”.



Exercise Mode

The generator starts regularly during the preset period to ensure the operation of the generator.

Running Mode

This mode is the off-grid operation mode of the generator, including switch mode and auto mode. The switch mode is used to turn on or turn off the generator manually; the auto mode is used to turn on or turn off the generator according to the battery capacity. The auto mode only supports generators controlled by Dry Contact. Otherwise, please select the switch mode.

Mode / Parameter	Auto Mode
Battery SOC (Generator Start)	When the battery capacity drops to the set value, the generator will turn on automatically.
Battery SOC (Generator Shutdown)	When the battery capacity reaches the set value, the generator will turn off automatically.
Quiet Time	During the quiet time, the generator is disabled.

Battery Charge Time

Description: The generator will charge the battery during the preset period.

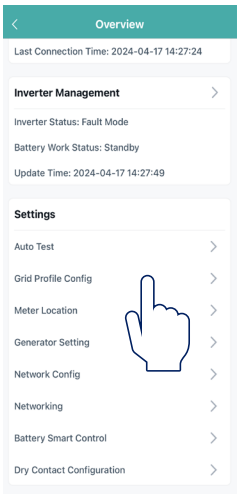
(b) If the GEN port is connected to the PV inverter, ensure that the PV side meter must be configured.

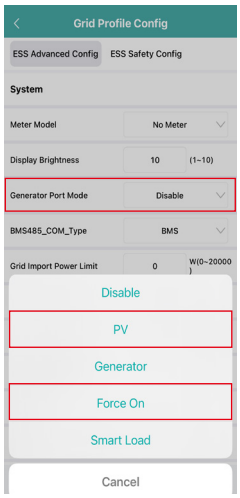
If the PV inverter cannot operate normally and has a meter communication fault, first tap “Grid Profile Config → Generator Port Mode → Force On” to enable the GEN port.

Secondly, check if the address, baud rate, data bits, and check digit are consistent with the master, if not, correct the wrong one. Note that the address of the PV side meter should be set to 001, and its corresponding data bits should be set to 8n1.

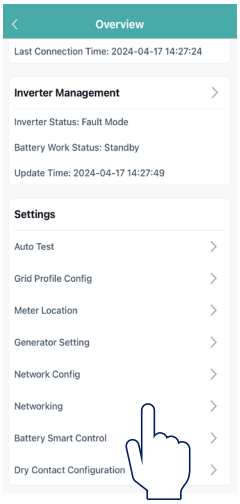
After the meter address is correctly set and the communication is normal, tap “Grid Profile Config → Generator Port Mode → PV”, and tap “Save”.

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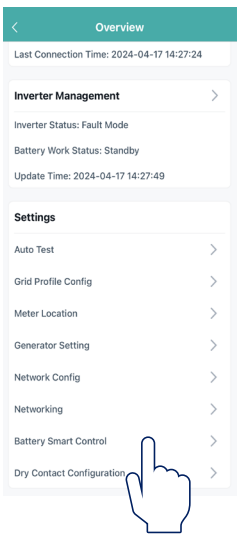


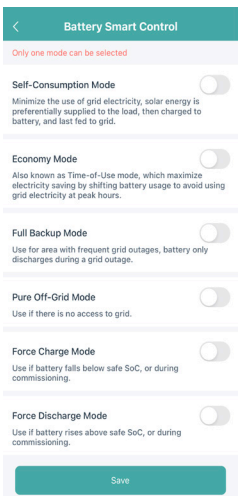
5. Tap “Networking” to access to the networking page, and tap “Networking” at the bottom left corner to perform parallel operation. The inverter connected to the DTS is the master, and the others are slaves. After the slaves are connected to the master through a communication cable, they can communicate with the DTS. Note that a single DTS can only communicate with up to 10 inverters. If you want to change the master, tap “unbind” to change the master or stop parallel operation.

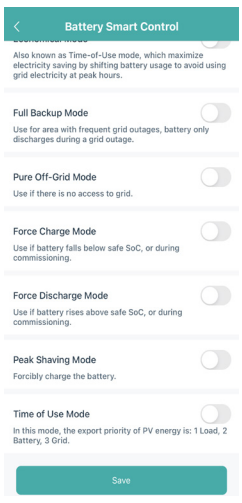




6. Tap “Battery Smart Control” to set the EMS mode, including Self-Consumption Mode, Economy Mode, Full Backup Mode, Pure Off-Grid Mode, Force Charge Mode, Force Discharge Mode, Peak Shaving Mode, and Time of Use Mode.







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★ Self-consumption Mode

In the daytime, solar energy supports the loads firstly, and surplus energy is stored in the battery. When the battery is fully charged or reaches the maximum charge power, the surplus energy is fed into grid (or limited if required). At night, the battery discharges for the loads firstly, and the grid will supply the loads once the battery power is not enough. In this mode, battery cannot be charged from grid at night.
The self-consumption mode can reduce the use of grid power. Solar energy is preferentially supplied to the load, charged to the battery, and fed into the grid last. Users can set the reserve capacity within a certain range (a small amount of power can be reserved due to infrequent power outages), and then tap “Save”.

★ Economy Mode

In this mode, battery charging and discharging periods need to be defined. Meanwhile, the battery can be forced to charge from the grid during the preset charging time. For instance, the battery could be charged or discharged according to valley or peak electricity prices. You can set reserve capacity within a certain range (a small amount of power can be reserved due to infrequent power outages), select the type of currency you need, and set different time periods to be more flexible to save costs of electricity. Tap “Edit” to set the time period for peak, low and partial peak grid prices in different seasons or dates, but you can just add up to four time periods, and then tap “Save”.

★ Full Backup Mode

Full backup mode can be selected when the grid frequently breaks down. The battery will be forced to charge to a set capacity so that it has enough power to support the electricity consumption in daily life when the inverter is in off-grid mode. You can also set the reserve capacity within the certain range and tap “Save”.

★ Pure Off-grid Mode

When the system is not connected to the grid, You can choose the pure off-grid mode and tap “Save”.

★ Force Charge Mode

The force charge mode can be used during the commissioning of inverter or when the battery capacity falls below the value of safety SOC. You can set the reserve capacity within the certain range. If the battery capacity is lower than the setting, the battery will be forcibly charged. And You can set the charging power of battery if needed. Finally, save the values you have changed.

★ Force Discharge Mode

The force discharge mode can be used during the commissioning of inverter or when the battery capacity rises above the value of safety SOC. You can set the reserve capacity within the certain range. If the battery capacity is higher than the setting, the battery will be forcibly discharged. And you can set the discharge power of battery if needed. Finally, save the values you have changed.

★ Peak Shaving Mode

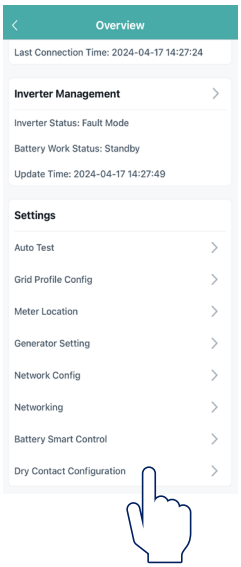
In this mode, the Peak Meter Power (the maximum power that the inverter obtains from the grid) can be set; only when PV and battery can fully supply the loads, can the Peak Meter Power be limited. Set the Peak Capacity to ensure the normal operation of this mode. When the battery SOC is less than the Peak Capacity, the grid can supply the loads or charge the battery with an output power not higher than the Peak Meter Power; when the battery SOC is less than the Reserve Capacity, the battery will not be discharged.

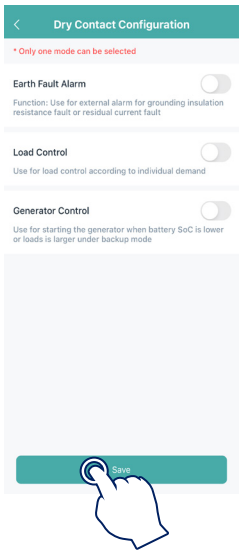
★ Time of Use Mode

Time of Use Mode allows users to customize the charge and discharge time of the battery within eight periods. During the pre-set charge time, the battery will be charged from the grid at the pre-set charging power until it reaches the pre-set stop charge SOC; during the pre-set discharge time, the battery will supply power to the load and the grid at the pre-set power until the battery discharges to the pre-set stop discharge SOC. The energy storage system allows users to freely set the charge and discharge time according to the local peak and valley electricity price to maximize the benefits. For the rest of the time, the system will run in self-consumption mode by default.

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7. Tap “Dry Contact Configuration” to edit dry contact configuration. Note that only one mode can be selected at a time.





★ Earth Fault Alarm

This function is used for external alarm caused by grounding insulation resistance fault or residual current fault. Disable the external alarm when the load is connected. This function is to produce alarm, not to cause tripping.

★ Load Control

Load control can be used according to individual demand. This setting is to control whether the load is working or not. There are six modes available as follows.

(1) **Switch Mode:** Manually turn on or turn off the dry contact.

(2) **Time Mode:** Set the time period for the dry contact to work. The dry contact is closed during this set time and disconnected at other times.

(3) **Intelligent Mode:** Because the energy generated by PV fluctuates a lot, this mode is to make the dry contact avoid being turned on and off frequently. The dry contact will only be turned on when the residual energy generated by the PV exceeds the power set by the load within the set time period. You can set the minimum run time and the nominal power of the dry contact.

(4) **Backup Load Smart Control:** The unnecessary dry contact will be turned off in off-grid situation when the battery capacity is lower than the set SOC value. You can set the value of protection SOC if needed.

(5) **EV Charger Smart Control:** In this mode, whether to start the EV charger can be determined based on the total input current. When the input current is less than the value of the entrance breaker size minus the EV Charger size, the EV Charger is allowed to work; when the input current is larger than the entrance breaker size, shut down the EV Charger to protect the entrance breaker.

(6) **Heat Pump Control:** The heat pump control function allows users to add up to four runtimes. According to the set power and battery SOC, it can control the start and stop as well as the power of the SG Ready heat pump, maximizing the PV energy utilization.

Parameter	Description
Start Power	When the average feed-in power is greater than or equal to the start power, the heat pump will be started.
Shutdown Power	When the running time is greater than or equal to the minimum single runtime and the average grid input power is greater than or equal to the shutdown power, the heat pump will be shut down.

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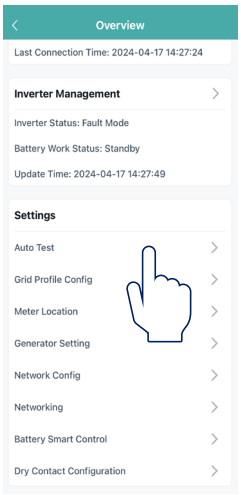
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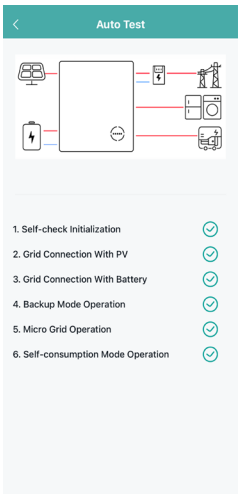
Battery Start SOC	There is an ON/OFF option. The default option is OFF. ON: when the average feed-in power is greater than or equal to the start power or the battery SOC is greater than or equal to the battery start SOC, the heat pump will be started.
Battery Shutdown SOC	When the running time is greater than or equal to the minimum single runtime and the battery SOC is less than the battery shutdown SOC, the heat pump will be shut down.
Min. Single Runtime	The minimum single runtime of the heat pump.
Max. Single-day Runtime	There is an ON/OFF option. The default option is OFF. ON: the heat pump will be shut down when the running time of the day reaches the maximum single-day runtime; it will be started again when the starting condition is reached the next day.

★ Generator Control

For detailed settings, please refer to 4 (a).

8. Make sure that all cables including DC cables, AC cables, and communication cables are properly connected, and all AC and DC switches are turned on, and then tap “Auto Test”. If there is any problem, solve the problem, and tap “Auto Test” again to confirm that the problem is completely solved. If there is no problem, this interface will display green checkmarks on the right of these items.

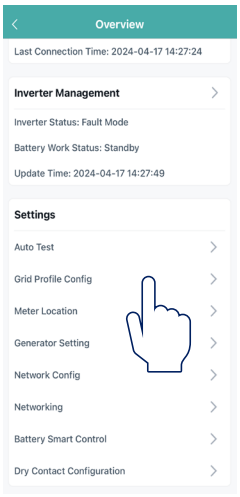


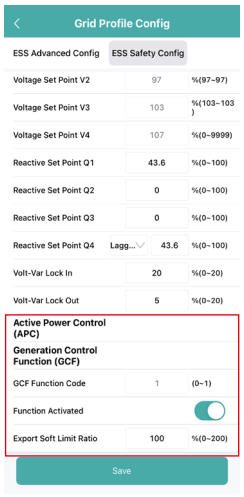


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3.5.3.3 Export Management Setting

Tap “Grid Profile Config → ESS Safety Config”, slide your fingers up, and set the parameters of export management. The Generation Control Function (GCF) is enabled by default, the default value of the export soft limit ratio is 100%.





(a) If no input device is connected to the grid side, and you do not need to limit the feed-in power, disable this function or skip this setting.

(b) If an input device, such as a microinverter, is connected to the grid side, and you do not need to limit the feed-in power, disable this function.

(c) If you need to limit the feed-in power, set the export soft limit ratio as required.

Scenario 1: Export Soft Limit Ratio is 0

The feed-in power of an Energy Storage System (ESS) is 0. If an input device, such as a microinverter, is connected to the grid side, its output power cannot be controlled; it will output power according to its logic.

Scenario 2: Export Soft Limit Ratio is 50%

The maximum allowable feed-in power is 50% of the rated power of ESS. If an input device, such as a microinverter, is connected to the grid side, it can operate at full power, and the energy storage inverter will adjust the output of ESS in real time according to the set export soft limit ratio.

Scenario 3: Export Soft Limit Ratio is 100%

The maximum allowable feed-in power is 100% of the rated power of ESS. If an input device, such as a microinverter, is connected to the grid side, it can operate with its full power, and the energy storage inverter will adjust the output of ESS in real time according to the set export soft limit ratio.

Scenario 4: Export Soft Limit Ratio is 150%

The maximum allowable feed-in power is 150% of the rated power of ESS. If an input device, such as a microinverter, is connected to the grid side, it can operate with its full power, and the energy storage inverter will adjust the output of ESS in real time according to the set export soft limit ratio.

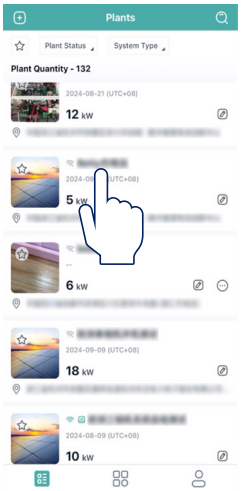
Note:

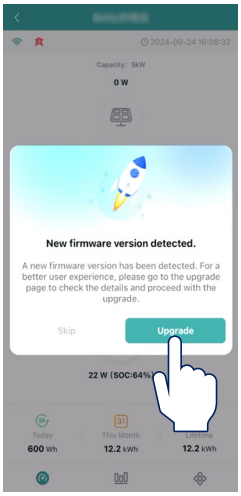
- ESS refers to a single energy storage inverter or parallel system
- The energy storage inverter cannot control the output power of other input devices connected to the grid side. It means that the feed-in power cannot be limited to 0 if other input devices are connected to the grid side.
- If no input device is connected to the grid side, the Export Soft Limit Ratio can be set to 0-100%.

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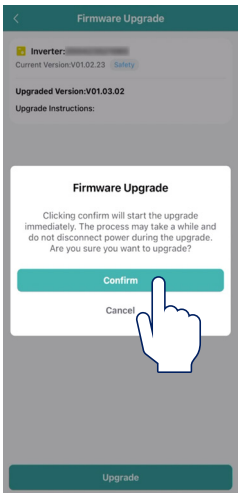
3.5.3.4 Firmware Upgrade

Open the app and tap the plant. There will be a pop-up window if there is a new firmware version. If you want to upgrade the firmware, tap “Upgrade”; if you do not want to upgrade immediately, tap “Skip”. Note that during the firmware upgrade, do not power off the inverter.

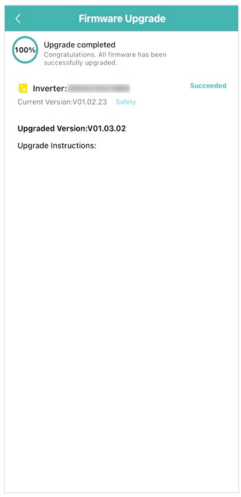












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4. Troubleshooting

When the system is in alarm, please log into the S-Miles Cloud App to review. The possible causes and their troubleshooting are detailed in the following table.

Display	Possible Cause	Handling Suggestions
Grid Overvoltage	The grid voltage is higher than the permissible range.	Generally, the inverter will reconnect to the grid after the grid recovers. If the alarm occurs frequently: 1. Make sure the ESS safety configuration of the inverter is set correctly. 2. Make sure that the grid voltage in your area is stable and within the normal range. 3. Check whether the cross-sectional area of the AC cable meets the requirement. 4. If the alarm persists, contact Hoymiles technical support team.
Grid Undervoltage	The grid voltage is lower than the permissible range.	Generally, the inverter will reconnect to the grid after the grid recovers. If the alarm occurs frequently: 1. Make sure the ESS safety configuration of the inverter is set correctly. 2. Make sure that the grid voltage in your area is stable and within the normal range. 3. Check whether the AC cable is firmly in place. 4. If the alarm persists, contact Hoymiles technical support team.
Grid Overfrequency	The grid frequency is higher than the permissible range.	Generally, the inverter will reconnect to the grid after the grid recovers. If the alarm occurs frequently: 1. Make sure the ESS safety configuration of the inverter is set correctly. 2. Make sure that the grid frequency in your area is stable and within the normal range. 3. If the alarm persists, contact Hoymiles technical support team.
Grid Underfrequency	The grid frequency is lower than the permissible range.	
No Grid	The inverter detects that there is no grid connected.	Generally, the inverter will reconnect to the grid after the grid recovers. If the alarm occurs frequently: 1. Check whether the grid supply is reliable. 2. Check whether the AC cable is firmly in place. 3. Check whether the AC cable is correctly connected. 4. Check whether the AC circuit breaker is disconnected. 5. If the alarm persists, contact Hoymiles technical support team.
Residual Current Fault	The residual leakage current is too high.	1. The alarm can be caused by high ambient humidity, and the inverter will reconnect to the grid after the environment is improved. 2. If the environment is normal, check whether the AC and DC cables are well insulated. 3. If the alarm persists, contact Hoymiles technical support team.
PV Reverse Connection	The inverter detects that the PV strings are reversely connected.	1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. If the alarm persists, contact Hoymiles technical support team.
PV Undervoltage	The PV voltage is lower than the permissible range.	1. Check whether the DC cable is firmly in place. 2. Check whether there is a PV module shaded. If so, remove the shade and ensure the PV module is clean. 3. Check whether the PV module is in abnormal aging. 4. If the alarm persists, contact Hoymiles technical support team.
PV Overvoltage	The PV voltage is higher than the permissible range.	1. Check the specification and numbers of corresponding string PV modules. 2. If the alarm persists, contact Hoymiles technical support team.

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Display	Possible Cause	Handling Suggestions
Over Temperature	The temperature inside the inverter is higher than the permissible range.	1. Make sure that the installation complies with the instructions from the User Manual. 2. Check whether the alarm “Fan Fault” occurs. If so, replace the faulty fan. 3. If the alarm persists, contact Hoymiles technical support team.
Isolation Fault	The insulation impedance of the PV string to the ground is too low.	1. Use a multimeter to determine if the resistance between the earth and the inverter frame is close to zero. If not, please ensure that the connection is good. 2. If the humidity is too high, an isolation fault may occur. Attempt to restart the inverter. If the fault persists, check it again when the weather turns fine. 3. Check the resistance to ground from the PV module/ cable. Take corrective measures in case of leading to a short circuit or damaged insulation layer. 4. If the alarm persists, contact Hoymiles technical support team.
Arc Fault	The inverter detects that there is an arc fault.	1. Disconnect the DC switch and check whether the DC cables are damaged and whether the wiring terminals are loose or in poor contact. If so, take corresponding corrective measures. 2. After taking corresponding measures, reconnect the DC switch. 3. If the alarm persists, contact Hoymiles technical support team.
EPS Load Overpower	The EPS load power is higher than the permissible range.	1. Reduce the power of EPS loads, or remove some EPS loads. The inverter will restart automatically. 2. If the alarm persists, contact Hoymiles technical support team.
Meter Reverse Connection	The inverter detects that the Meter or CT is reversely connected.	1. Make sure that the installation complies with the instructions from the User Manual. 2. If the alarm persists, contact Hoymiles technical support team.
Meter Communication Fault	The inverter detects that there is a meter communication fault.	1. Check whether the Meter communication cable and terminal are abnormal. 2. Reconnect the Meter communication cable. 3. If the alarm persists, contact Hoymiles technical support team.
Battery Reverse Connection	The inverter detects that the battery wirings are reversely connected.	1. Check the battery for polarity correctness, and correct it if necessary. 2. If the alarm persists, contact Hoymiles technical support team.
Battery Voltage Fault	The battery voltage is higher than the permissible range.	1. Check if the battery input voltage is within the normal range. 2. If the alarm persists, contact Hoymiles technical support team.
BMS Communication Fault	The inverter detects that there is a BMS communication fault.	1. Check whether the BMS communication cable and terminal are abnormal. 2. Reconnect the BMS communication cable. 3. If the alarm persists, contact Hoymiles technical support team.

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Display	Possible Cause	Handling Suggestions
BMS Battery Alarm	The inverter detects that there is a battery fault from BMS.	Try to restart the battery. If the fault persists, contact the battery manufacturer.
BMS Battery Fault	The inverter detects that there is a battery fault from BMS.	Try to restart the battery. If the fault persists, contact the battery manufacturer.
Relay Fault	The inverter detects that there is a relay self-check fault.	Try to restart the inverter. If the fault persists, contact Hoymiles technical support team.

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5. Technical Datasheet

Model	HYS-8.0LV-EUG2	HYS-10.0LV-EUG2	HYS-12.0LV-EUG2
Battery			
Battery type		Li-ion/Lead-acid(1)	
Battery voltage range (V)		40-60	
Max. charge/discharge current (A)	160/160	200/200	240/240
Max. charge/discharge power (W)	8000/8000	10000/10000	12000/12000
Charging strategy for Li-ion battery		Self-adaption to BMS	
Charging curve		3 Stages/Equalization	
External temperature sensor		Optional	
Communication		CAN	
PV Input			
Recommended max. PV power (W)	10400	13000	15600
Max. input voltage (V)		550	
Rated voltage (V)		360	
Start-up voltage (V)		150	
MPPT voltage range (V)		125-500	
Max. input current (A)	32/32	32/32	32/32
Max. short circuit current (A)	40/40	40/40	40/40
MPPT number/Max. input strings number	2/4	2/4	2/4
AC Input and Output (On-grid)			
Rated output power (W)	8000	10000	12000
Max. output apparent power (VA)	8800	11000	13200
Max. input power (W)	23000	23000	23000
Grid form		L/N/PE	
Rated AC output voltage/Range (V)		220/230, 154-276	
Rated grid frequency (Hz)		50/60	
Max. output current (A)	38.3	47.8	57.4
Max. input current (A)	100	100	100
Power factor		>0.99 (0.8 leading ... 0.8 lagging)	
THDi (@rated output)		<3%	
AC Output (Off-grid)			
Rated output power (W)	8000	10000	12000
Max. output apparent power (VA)	16000, 10s	20000, 10s	23000, 10s
Back-up switch time (ms)		<10	
Grid form		L/N/PE	
Rated output voltage (V)		220/230	
Rated output frequency (Hz)		50/60	
Max. continuous output current (A)	34.8	43.5	52.2
THDv (@linear load)		<3%	
Efficiency			
MPPT efficiency	99.9%	99.9%	99.9%
Max. efficiency	97.6%	97.6%	97.6%
EU efficiency	97.0%	97.0%	97.0%
Max. battery discharge to AC efficiency	95.0%	95.0%	95.0%
Protection			
Anti-islanding protection		Integrated	
PV string input reverse polarity protection		Integrated	
Insulation resistor detection		Integrated	
Residual current monitoring unit		Integrated	
AC over current protection		Integrated	
AC short current protection		Integrated	
AC overvoltage and undervoltage protection		Integrated	
Surge protection		DC Type II/AC Type III	
General			
Dimensions (W × H × D [mm])		502 × 740 × 202	
Weight (kg)		41	
Mounting		Wall mounting	
Operating temperature (°C)		-25 to +65 (>45, derating)	
Relative humidity		0-95%, no condensing	
Cooling		Smart cooling	
Topology (Solar/Battery)		Transformerless/High-frequency isolation	
Altitude (m)		≤2000	
Protection degree		IP65	
Noise (dB)		<40	
User interface		LED, APP	
Digital input/output		1 × DI, 2 × DO	
Max. parallel		10	
Communication		RS485, Optional: Wi-Fi/Ethernet/4G(2)	
Certifications and Standards			
Grid connection standard		EN 50549, NRS 097-2-1	
Safety/EMC standard		IEC 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4	

(1) Lead-acid batteries will be supported soon.
(2) The DTS-Ethernet and DTS-4G solutions will be coming soon.

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S-Miles Installer

S-Miles End-user

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