Open Energy for All

Hybrid/AC-coupled Inverter

USER MANUAL

HYT-5.0HV-EUG1
HYT-6.0HV-EUG1
HYT-8.0HV-EUG1
HYT-10.0HV-EUG1
HYT-12.0HV-EUG1
HAT-5.0HV-EUG1
HAT-6.0HV-EUG1
HAT-8.0HV-EUG1
HAT-10.0HV-EUG1

CONTENTS

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 10 minutes before opening the inverter or touching live parts.
	Products shall not be disposed as household waste.
	CE mark.
	UKCA mark.

	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.
	No more than six (6) identical packages are to be stacked on each other.

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 on site 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 the inverter and wait for at least 10 minutes. Hazardous voltage will exist for up to 10 minutes after disconnection from the 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 10 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 the 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 the inverter cools down.

 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 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 10 minutes after disconnecting the power.
 CAUTION	• The inverter has a transformer-less 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 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℃ (194℉). • 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 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 the 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, refer to troubleshooting or contact your local distributor or qualified electricians.

1.3 EU Declaration of Conformity

Hoymiles Power Electronics Inc. hereby declares that the inverter described in this document is in compliance with the basic requirements and other relevant provisions of the following directives.

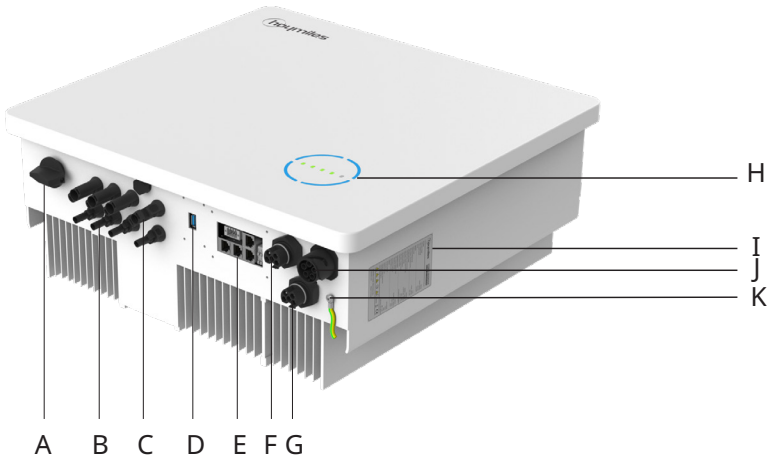
- Electromagnetic Compatibility Directive 2014/30/EU (EMC)
- Low Voltage Directive 2014/35/EU (LVD)
- Restriction of the use of certain hazardous substances Directive 2011/65/EU and its amendment directives (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment Directive 2012/19/EU (WEEE)

More detailed information can be found at https://www.hoymiles.com.

2. Product Introduction

2.1 Product Overview

The HYT-HV Series is a high-performance three-phase hybrid inverter with excellent reliability. The HAT-HV series is designed to retrofit PV systems. 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.



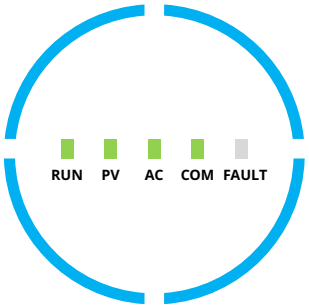
* The image shown here is for reference only. The actual product received may differ.

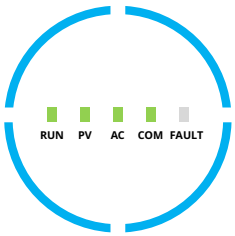
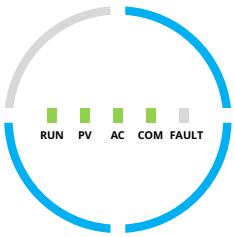
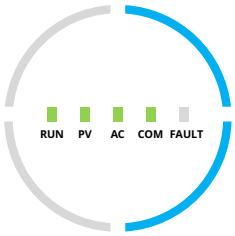
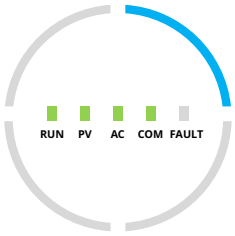
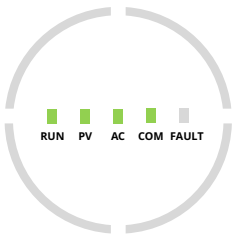
Object	Description
A	DC Switch(1)
B	PV Terminals(2)
C	Battery Terminals
D	Data Transfer Stick (DTS) Port
E	Communication Port
F	GRID Terminal
G	Generator (GEN) Terminal
H	LED Indicators
I	Label
J	Emergency Power Supply (EPS) Terminal
K	PE Terminal

(1) Only for HYT series inverters.

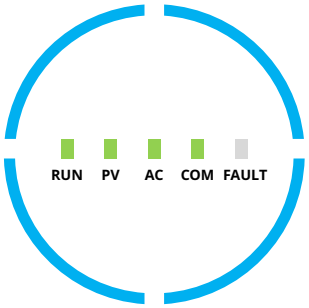
(2) Only for HYT series inverters.

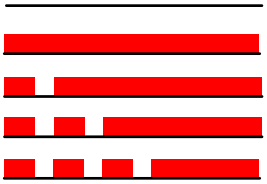
LED Indicators



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

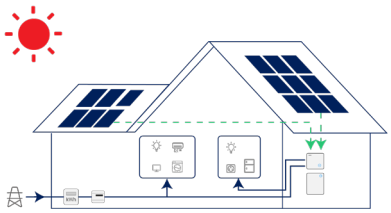
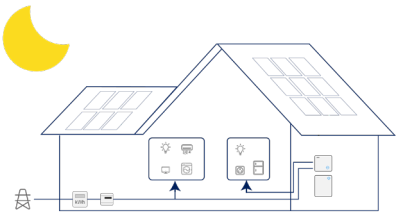
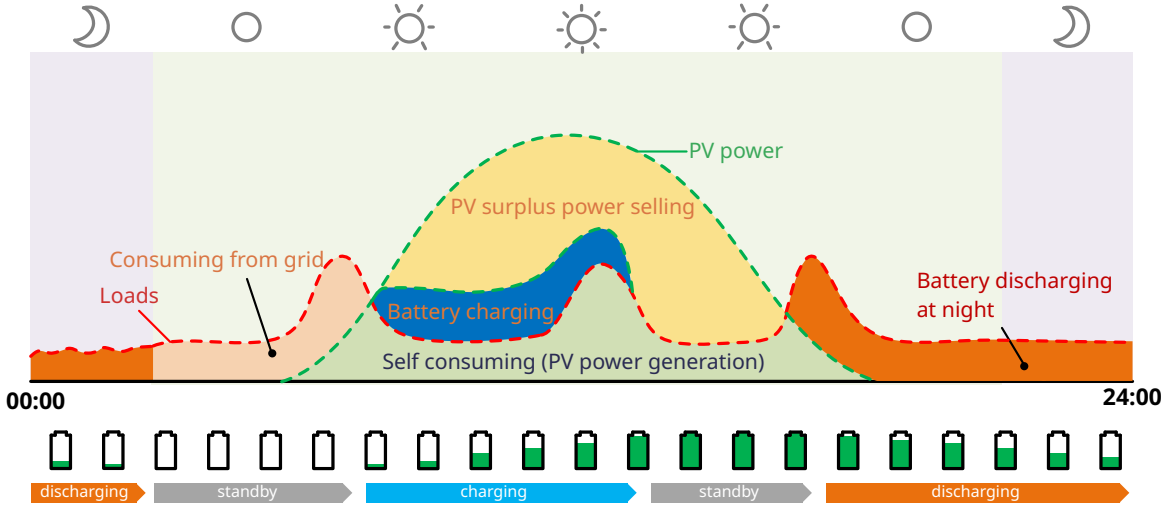
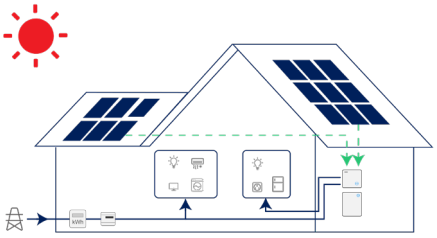
LED Indicators

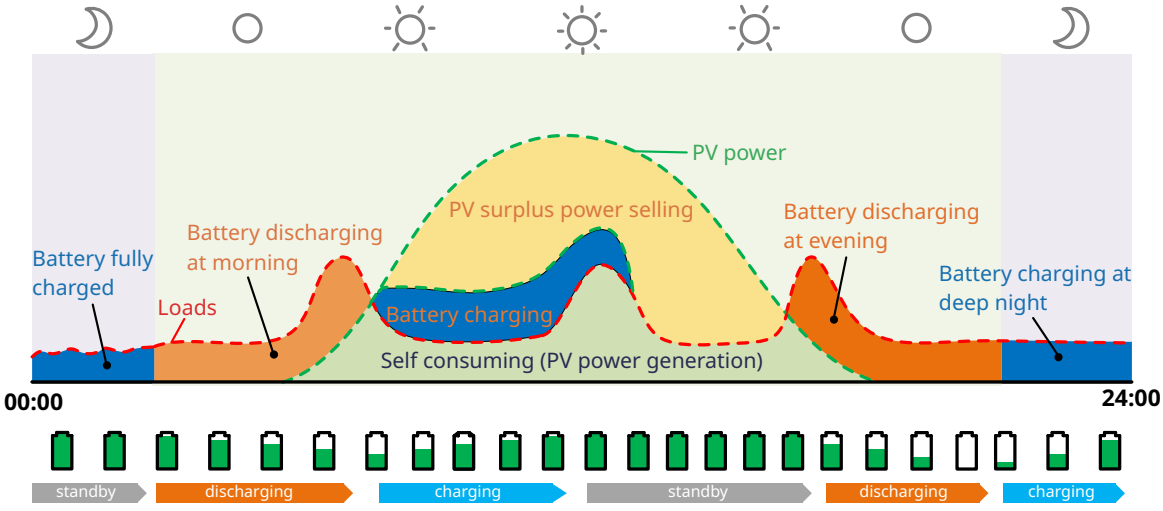


Indicator	Status	Explanation
RUN		Off – Inverter is shut down Blink 1 – Inverter is booting Blink 2 – Inverter is in bypass mode On – Inverter is turned on
PV (Only for HYT)		Off – PV voltage is low Blink 1 – PV power is low On – PV is generating power
AC		Off – Grid is disconnected and EPS is off, or 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

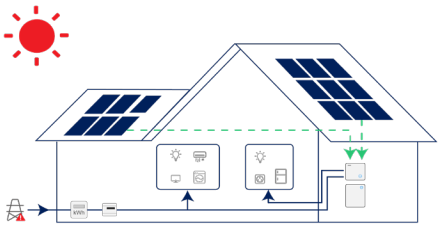
2.2 Operating Modes

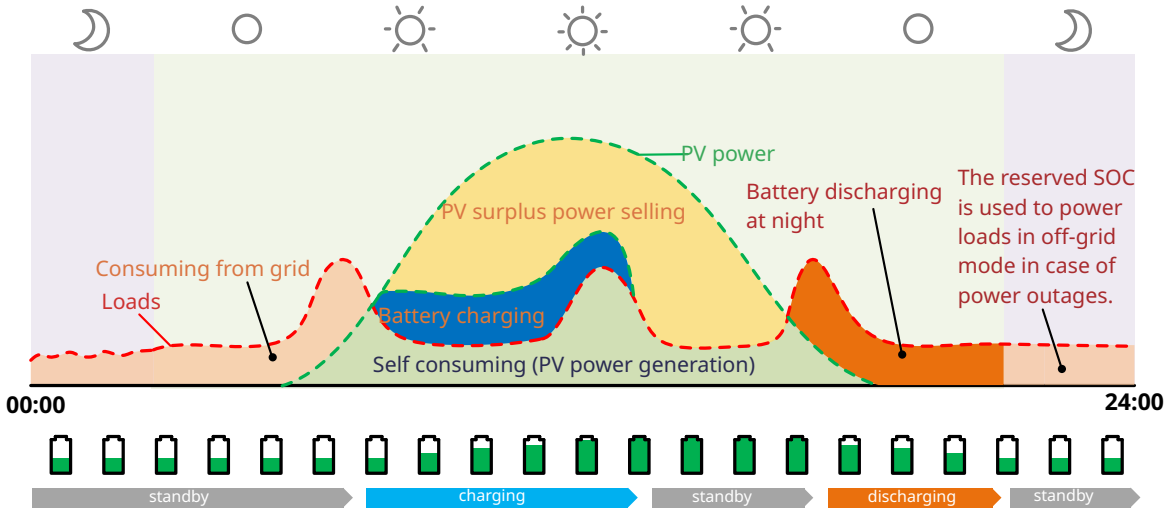
<table>
<tr><th colspan="3">Main Operation Modes</th></tr>
<tr><td colspan="3">The following operation modes are applicable for the HYT series inverter, and are also applicable for the HAT series inverter which is connected to the PV inverter.</td></tr>
<tr><td>Self-consumption Mode</td><td>In the daytime, solar energy is used to power the loads first, and surplus energy is stored in the battery. After the battery has been fully charged or reaches its maximum charge power, the excess solar energy is fed into the grid (or limited if necessary).

At night, the battery discharges for the loads first, and once the battery power is insufficient, the grid supplies power to the loads. In this mode, the battery cannot be recharged from 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>Economic Mode</td><td>In this mode, the time of battery charge and discharge needs to be set. Meanwhile, 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>



Power flow of economic 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.	



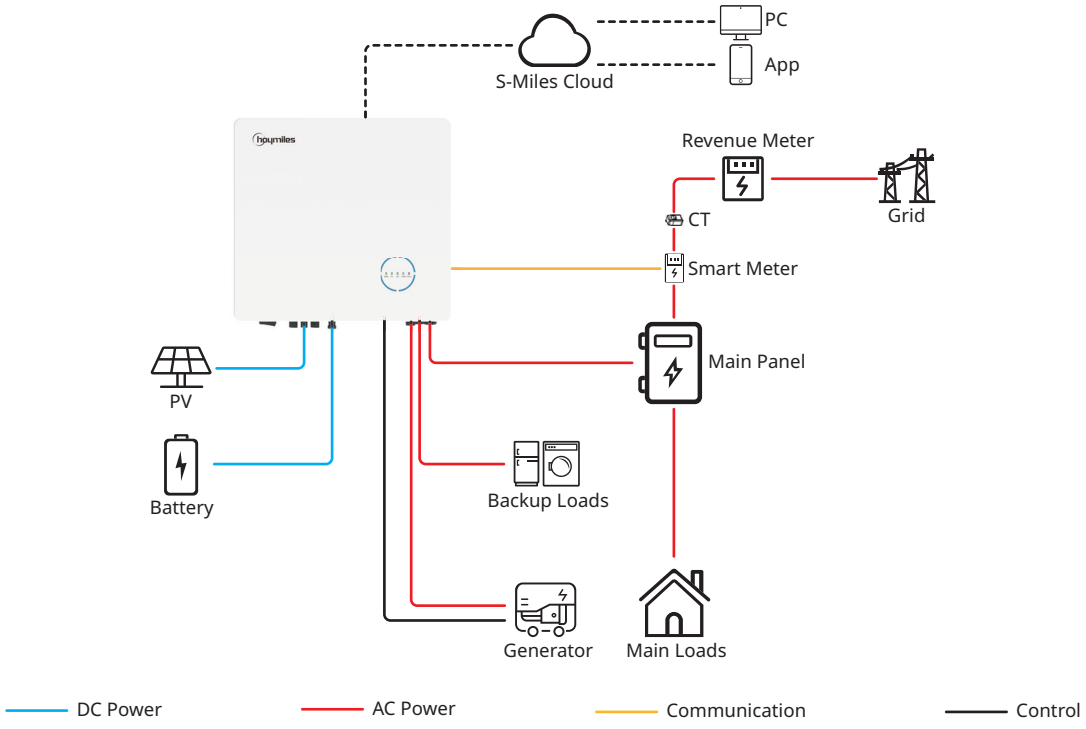
Power flow of backup mode

2.3 System Diagram

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 prior to installing any battery not included in the official published list.

2.3.1 HYT-(5.0-12.0)HV-EUG1

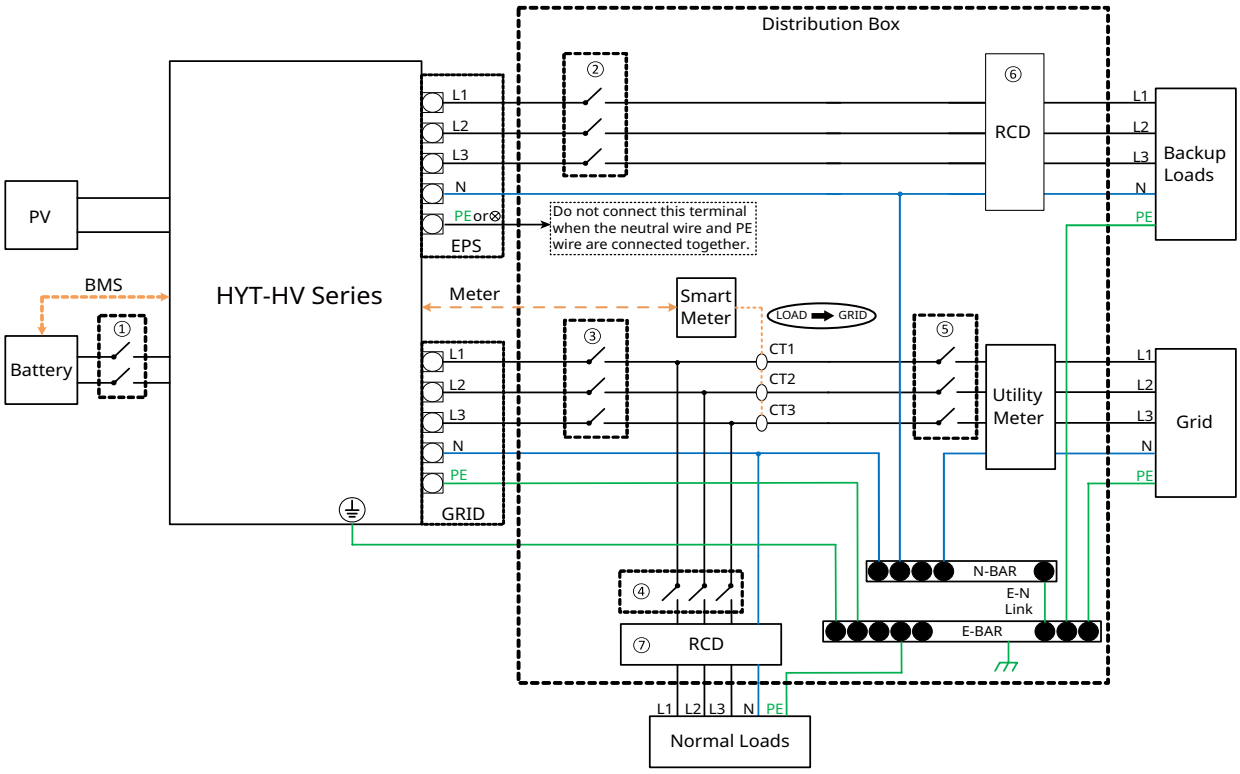
The HYT-HV series inverter can be connected to a battery and PV panels to form a PV Energy Storage System (ESS). In the event of a grid outage, it can be used as an emergency power supply (EPS) through the self-consumption of solar energy. It can form a hybrid system for a new installation or an AC-coupled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



2.3.1.1 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!



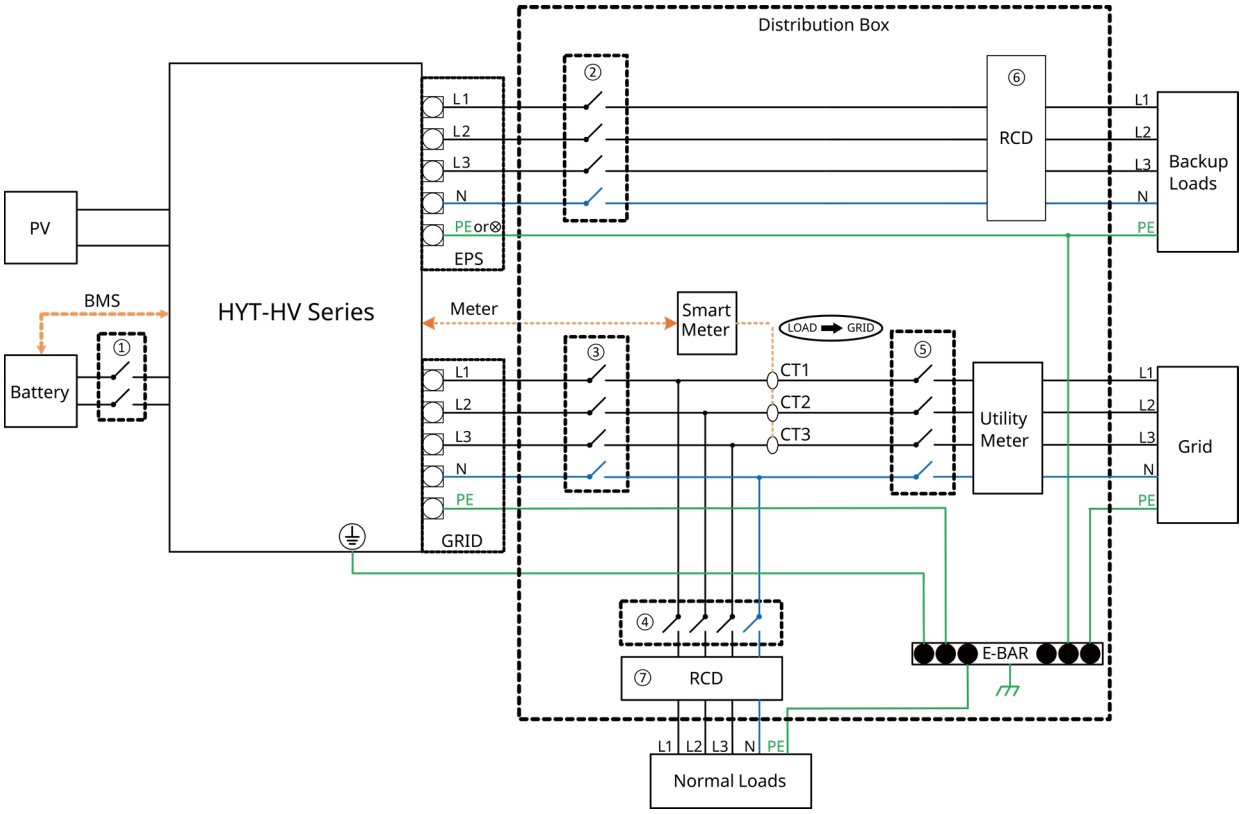
Model	①	②	③	④	⑤	⑥⑦
HYT-5.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	20 A/400 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HYT-6.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	25 A/400 V AC Breaker			
HYT-8.0HV-EUG1	40 A/600 V DC Breaker	20 A/400 V AC Breaker	32 A/400 V AC Breaker			
HYT-10.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	32 A/400 V AC Breaker			
HYT-12.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	32 A/400V AC Breaker			

Note:

- If the battery integrates a readily accessible internal DC breaker, no additional ① DC breaker is required.
- ⑥⑦ 30 mA RCD is recommended but not mandatory; please comply with local regulations.

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 back-up 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	⑥⑦
HYT-5.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	20 A/400 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HYT-6.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	25 A/400 V AC Breaker			
HYT-8.0HV-EUG1	40 A/600 V DC Breaker	20 A/400 V AC Breaker	32 A/400V AC Breaker			
HYT-10.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	32 A/400 V AC Breaker			
HYT-12.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	32 A/400 V AC Breaker			

Note:

- If the battery integrates a readily accessible internal DC breaker, no additional ① DC breaker is required.
- ⑥⑦ 30 mA RCD is recommended but not mandatory; please comply with local regulations.

2.3.1.2 Retrofit Diagram

The HYT-HV series inverter is compatible with any grid-connected PV inverter. With the addition of 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

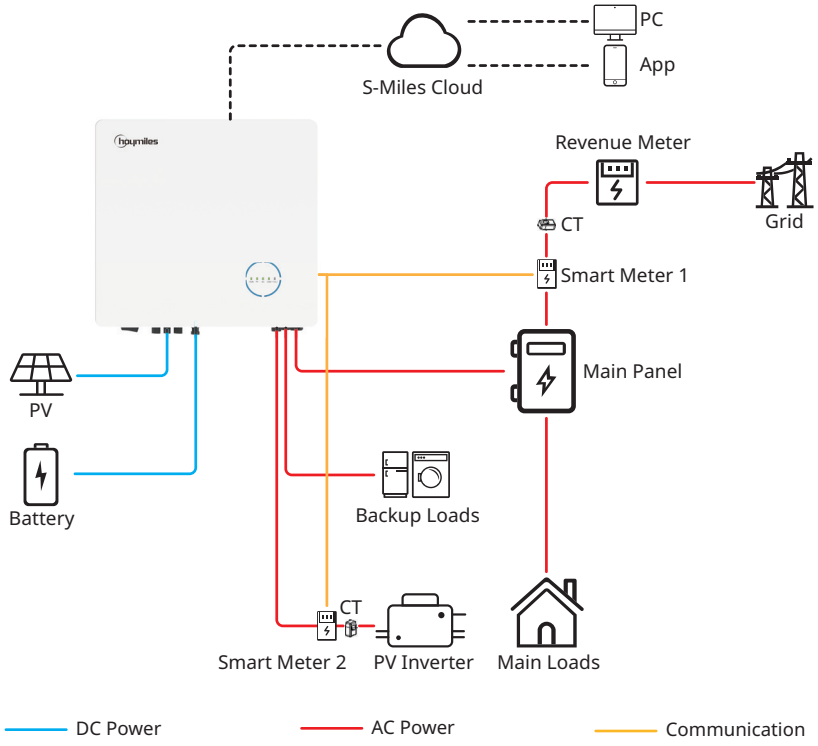


Diagram 2

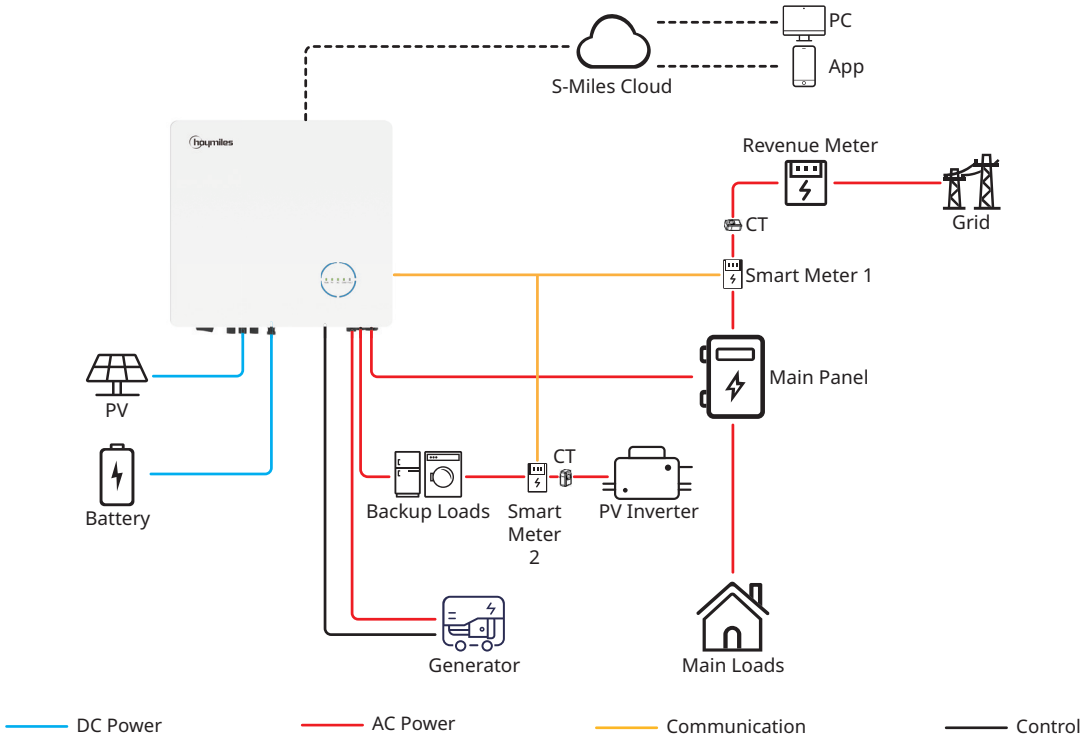
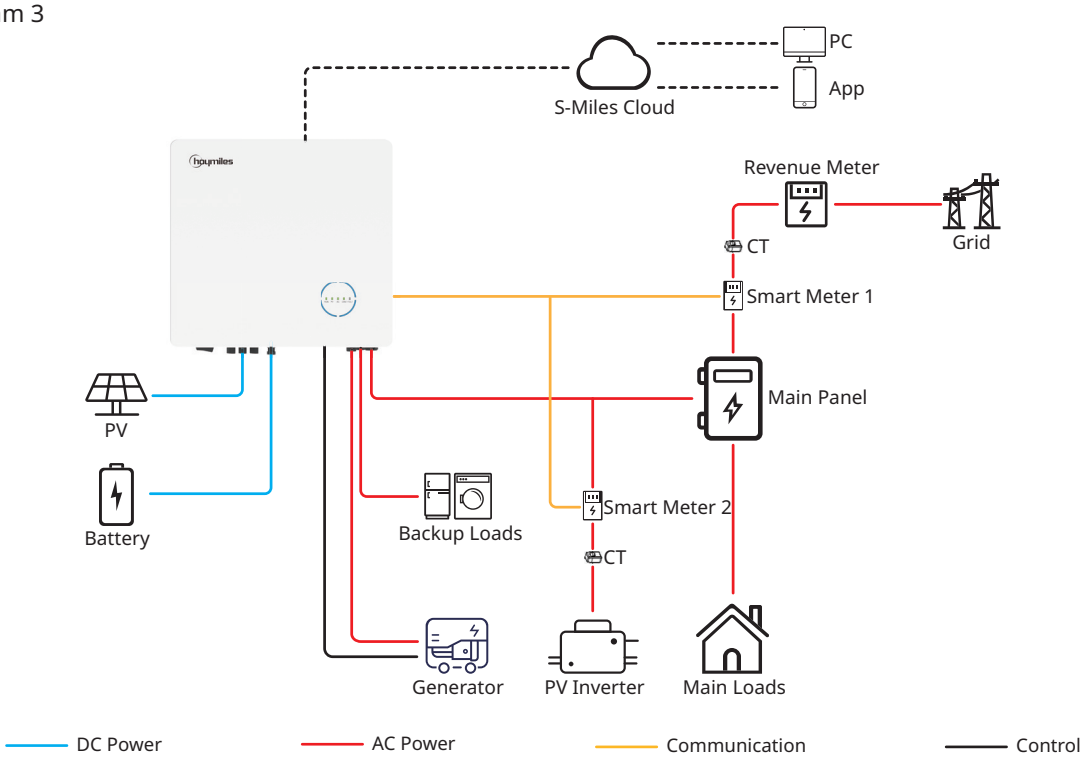


Diagram 3

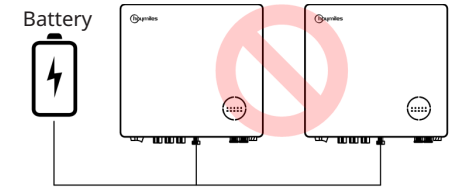


Note:

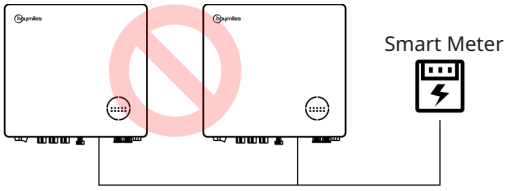
- If there is a strong desire to use this system in off-grid mode, it is recommended to connect the PV inverter to the GEN port (Diagram 1) or EPS port (Diagram 2); if not, it is recommended to connect the PV inverter to the grid port (Diagram 3).
- If the PV inverter is connected to the GEN port or EPS 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.

2.3.1.3 Unacceptable Diagram

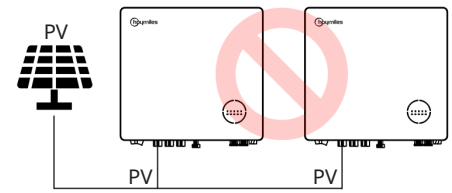
Avoid the following installation types to prevent damage to the system or the hybrid inverter.



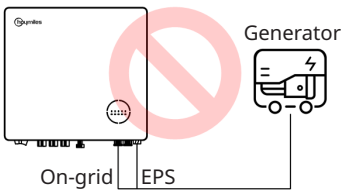
One battery cannot be connected to multiple inverters.



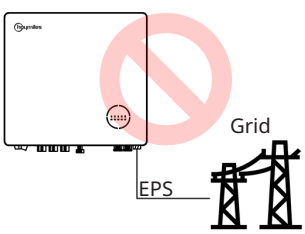
One meter cannot be connected to multiple inverters and different CTs cannot be connected to the same line cable.



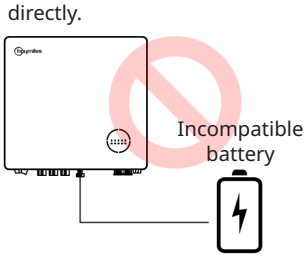
Single PV cannot be connected to multiple inverters.



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



EPS port cannot be connected to grid directly.



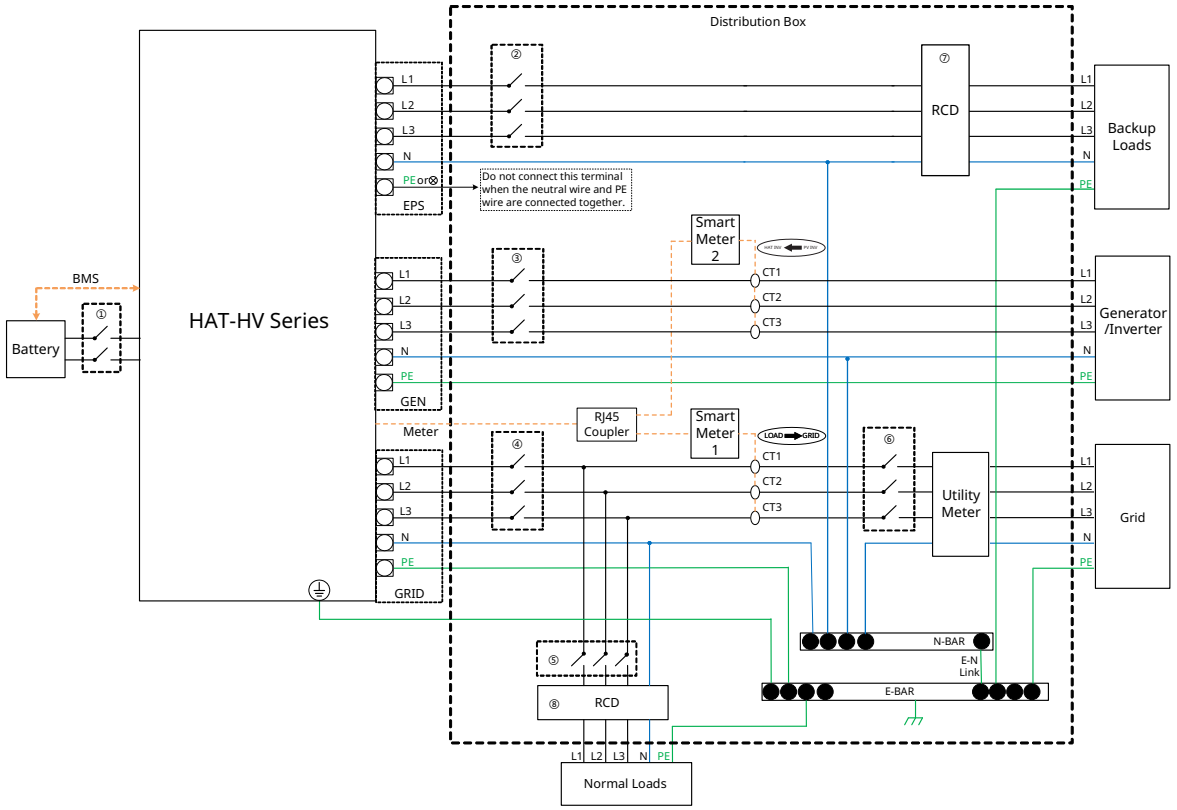
Incompatible battery cannot be connected to battery port.

2.3.2 HAT-(5.0-10.0)HV-EUG1

2.3.2.1 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!



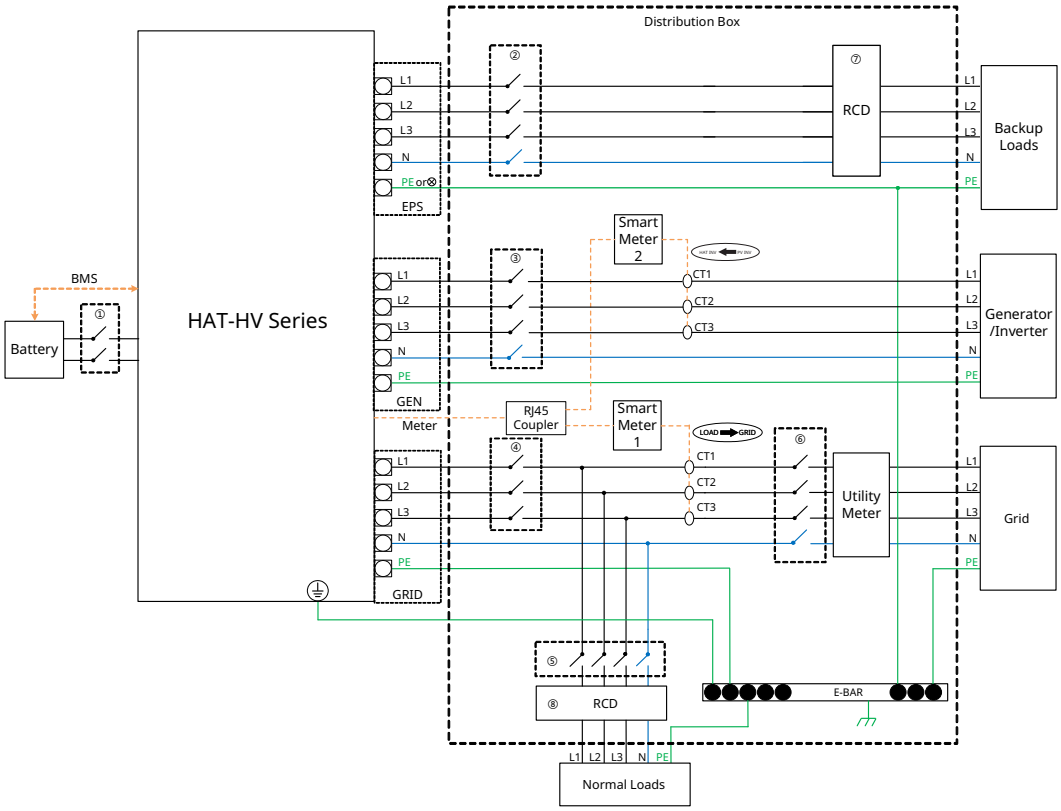
Model	①	②	③	④	⑤	⑥	⑦⑧
HAT-5.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	16 A/400 V AC Breaker	20 A/400 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HAT-6.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	16 A/400 V AC Breaker	25 A/400 V AC Breaker			
HAT-8.0HV-EUG1	40 A/600 V DC Breaker	20 A/400 V AC Breaker	20 A/400 V AC Breaker	32 A/400 V AC Breaker			
HAT-10.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	25 A/400 V AC Breaker	32 A/400 V AC Breaker			

Note:

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

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 back-up 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
HAT-5.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	16 A/400 V AC Breaker	20 A/400 V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HAT-6.0HV-EUG1	25 A/600 V DC Breaker	16 A/400 V AC Breaker	16 A/400 V AC Breaker	25 A/400 V AC Breaker			
HAT-8.0HV-EUG1	40 A/600 V DC Breaker	20 A/400 V AC Breaker	20 A/400 V AC Breaker	32 A/400 V AC Breaker			
HAT-10.0HV-EUG1	40 A/600 V DC Breaker	25 A/400 V AC Breaker	25 A/400 V AC Breaker	32 A/400 V AC Breaker			

Note:

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

2.3.2.2 Retrofit Diagram

The HAT-HV series inverter is compatible with any grid-connected PV inverter. With the addition of Hoymiles AC-coupled 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

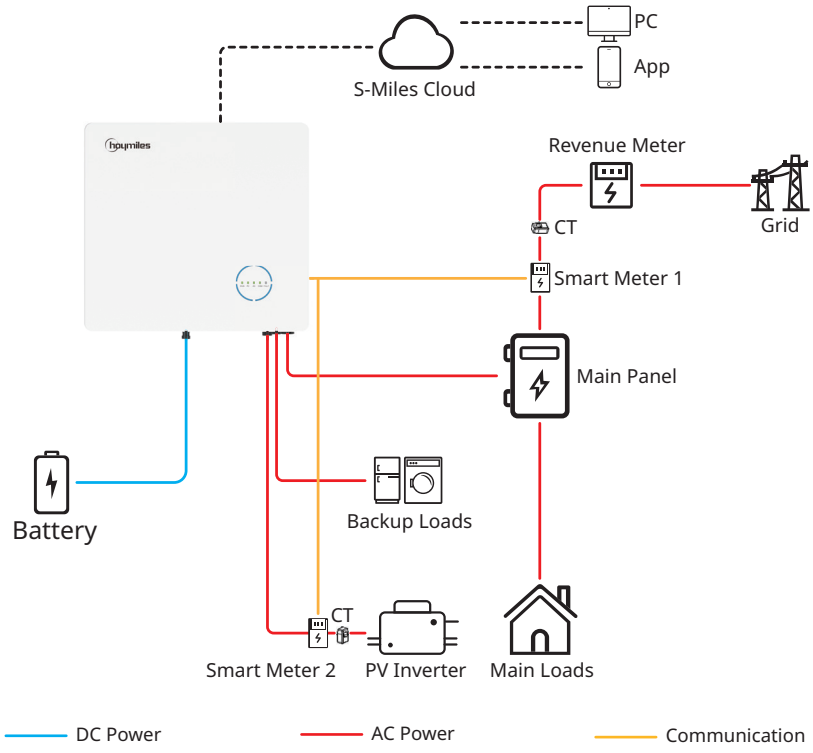


Diagram 2

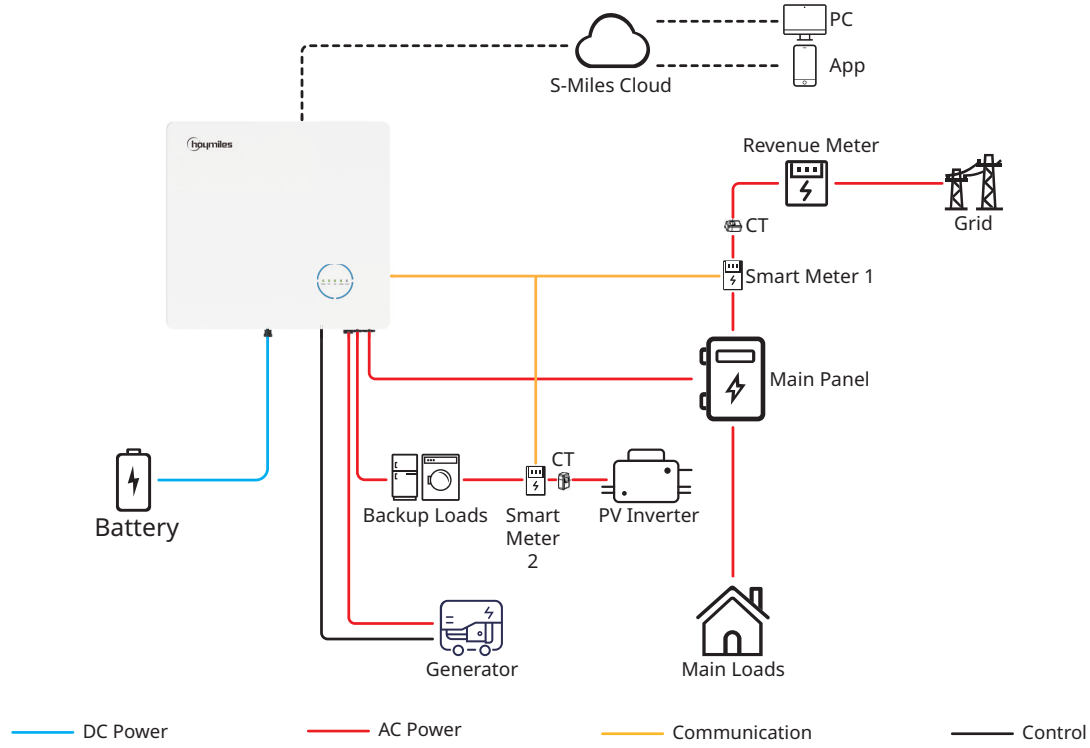
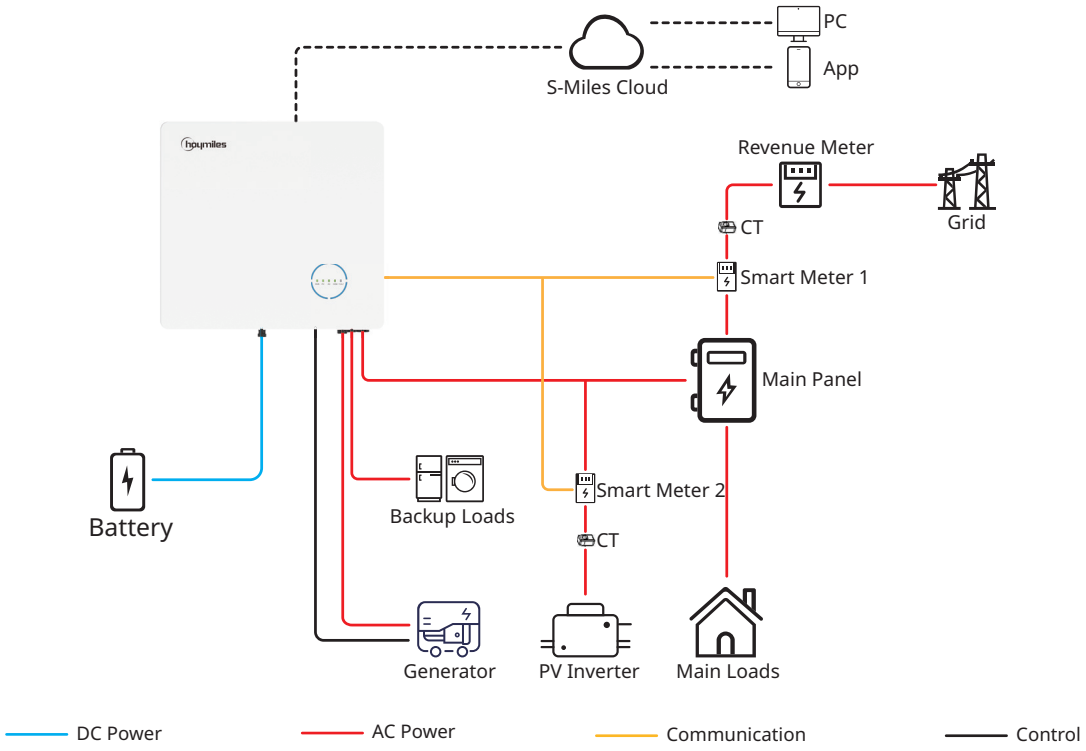


Diagram 3

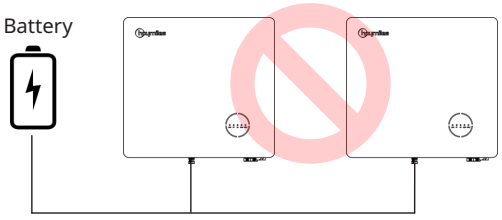


Note:

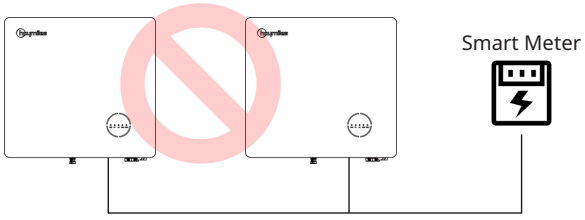
- If there is a strong desire to use this system in off-grid mode, it is recommended to connect the PV inverter to the GEN port (Diagram 1) or EPS port (Diagram 2); if not, it is recommended to connect the PV inverter to the grid port (Diagram 3).
- If the PV inverter is connected to the GEN port or EPS port, the power of the PV inverter shall be less than the rated output power of Hoymiles AC-coupled 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.

2.3.2.3 Unacceptable Diagram

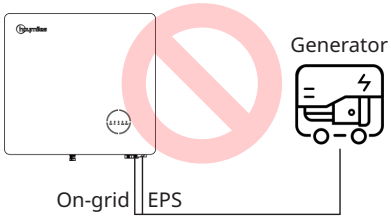
Avoid the following installation types to prevent damage to the system or the AC-coupled inverter.



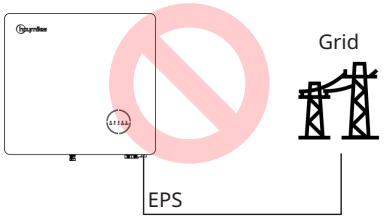
One battery cannot be connected to multiple inverters.



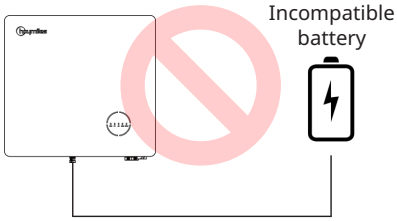
One meter cannot be connected to multiple inverters and different CTs cannot be connected to the same line cable.



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



EPS port cannot be connected to grid directly.



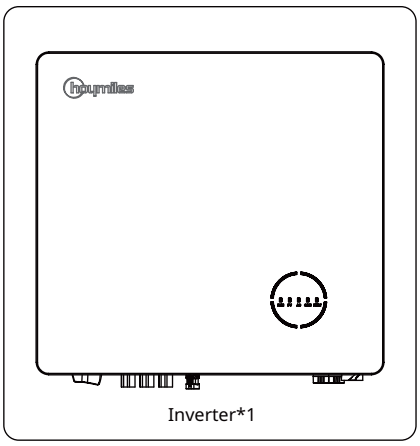
Incompatible battery cannot be connected to battery port.

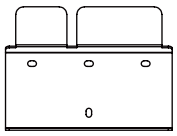
3. Installation Instruction

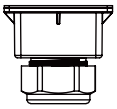
3.1 Packing List

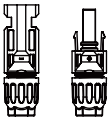
Please ensure that none of the components listed below are missing or damaged upon receipt of the hybrid inverter or AC-coupled inverter.

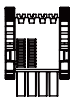
HYT-(5.0-12.0)HV-EUG1


Inverter*1

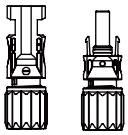

Bracket*1

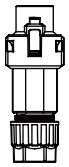

Communication Box*1


PV Connector(+)*2 or 3
PV Connector(-)*2 or 3


Double Row Plug*1

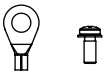
Document*1


Battery Connector(+)*1
Battery Connector(-)*1


Grid Connector*1
Generator Connector*1


EPS Connector*1


M6 Expansion Screw*4
Sleeve*4


Ground Terminal*1
M4 Setscrew*1

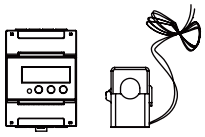

M3 Setscrew*6

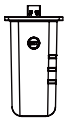

Communication
Terminal*12


AC Terminal*15

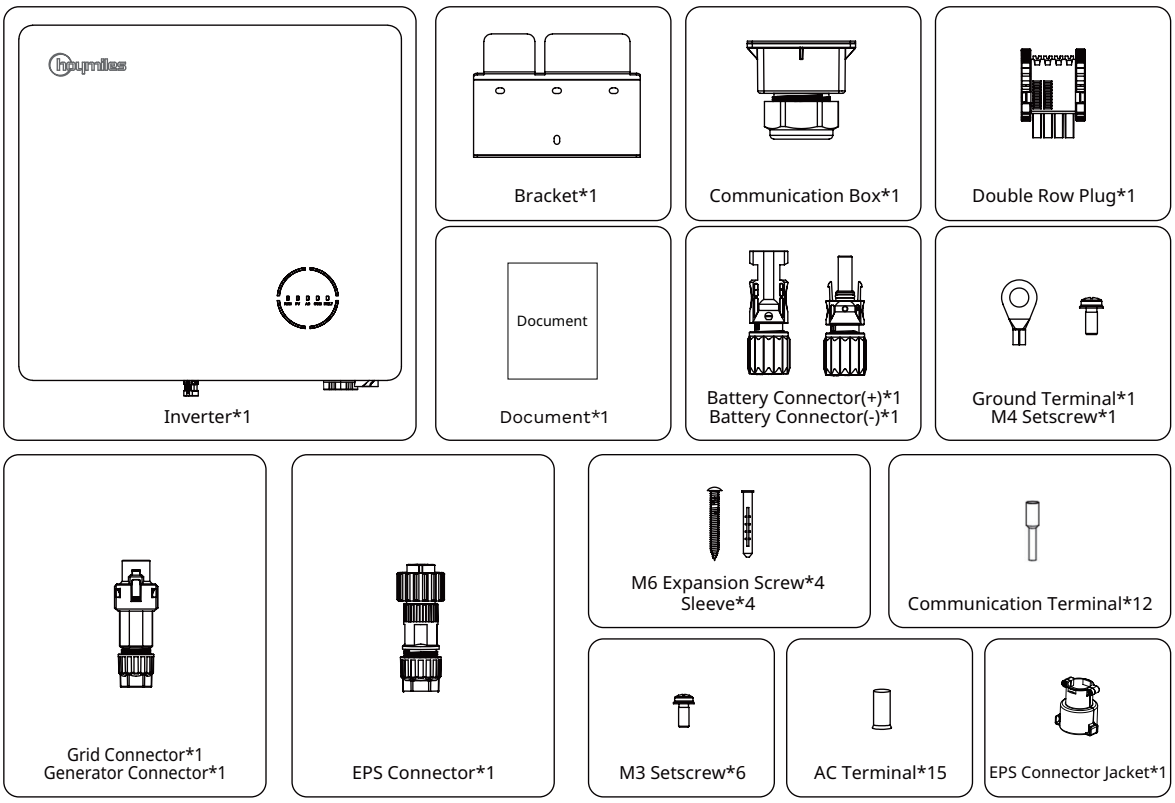

EPS Connector Jacket*1

Accessories packing list

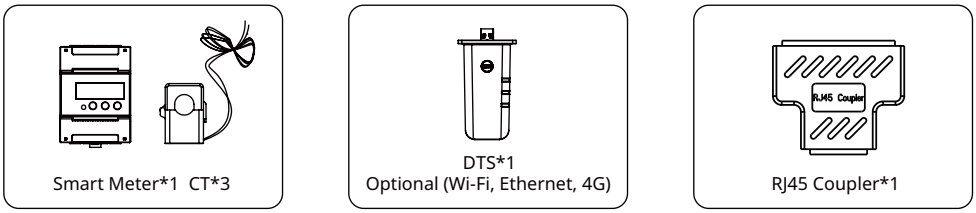

Smart Meter*1 CT*3


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

HAT-(5.0-10.0)HV-EUG1

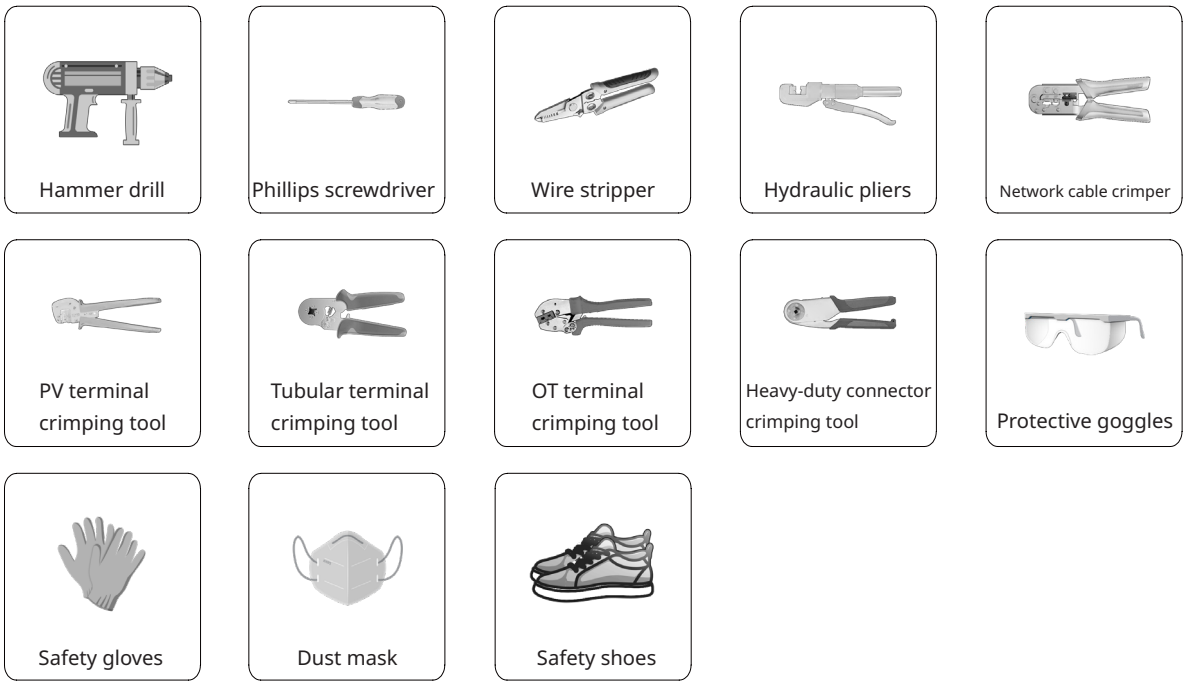


Accessories packing list



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.



3.3 Mounting

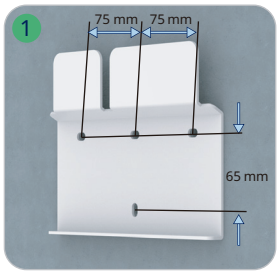
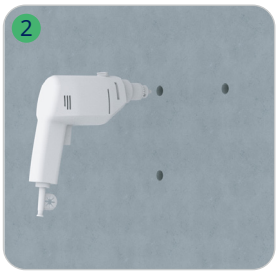
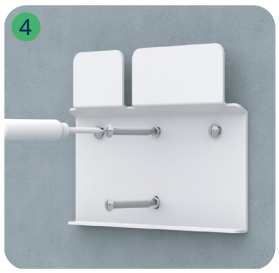
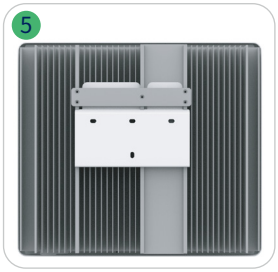
3.3.1 Selecting the Mounting Location

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 which 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 clearly visible after installation. 9. The inverter should be installed far from flammable materials.

3.3.2 Mounting Inverter

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

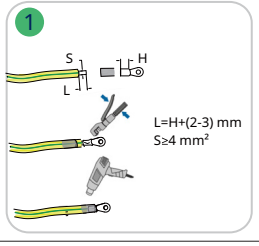
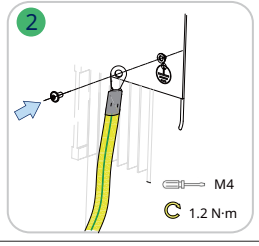
Procedure		
Step 1	Position the bracket against the wall and mark the 4 drilling hole locations.	 
Step 2	Drill holes with a driller, and make sure the holes are deep enough (at least 60 mm).	
Step 3	Place sleeves in the holes, and then tighten them.	 
Step 4	Fix the wall bracket with expansion screws.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

3.4 Electrical Wiring Connection

WARNING	• Prior to 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.
NOTICE	• For installation video, Please visit www.youtube.com/@Hoymiles/videos.

3.4.1 Grounding Connection

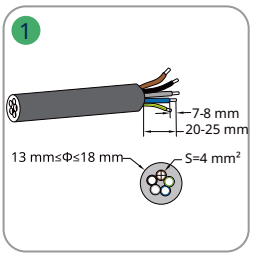
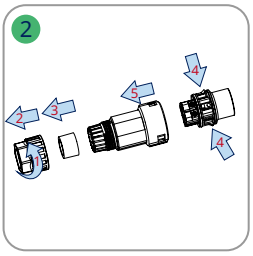
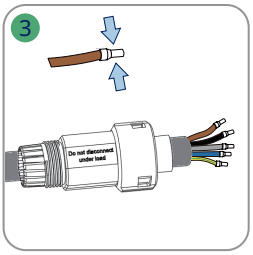
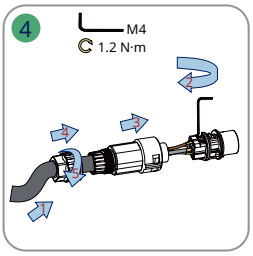
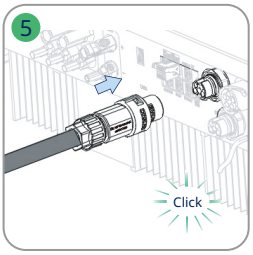
All non-current carrying metal parts and device enclosures in the PV power system should be grounded. There is an additional grounding terminal located at the bottom right of the inverter, being connected to a nearby grounding point.

Procedure		
Step 1	Prepare the cable and OT/DT terminal.	 
Step 2	Use the screw from the accessory box. Then fasten the cable with a screwdriver.	

3.4.2 AC Wiring Connection

3.4.2.1 Grid Connection

WARNING	Before connecting the grid, please make sure all requirements listed below are followed. • Use the grid connector from the accessory box. Damage to the device due to the use of an incompatible connector shall not be covered by the warranty. • An independent three or four-pole 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. • Do not connect the AC circuit breaker until all inverter electrical connections are completed.

Procedure		
Step 1	• Remove the cable jacket by 20-25 mm, and strip the wire insulation by 7-8 mm. • The conductor cross-sectional area: 4 mm².	
Step 2	• Unscrew the grid connector counterclockwise. • Disassemble the parts in sequence.	
Step 3	• Insert the cable conductor core into the terminals and crimp them tightly. Make sure the cable jacket is not locked within the connector. • Thread the AC cable of appropriate length through the waperproof terminal.	
Step 4	• Fix all cables to the corresponding terminals with a torque of 1.2 N•m using the screwdriver according to the markings on the connector. Make sure the L1/L2/L3/N/PE cables are correctly assembled. • Assemble the parts in sequence. • Tighten the waterproof terminal clockwise.	
Step 5	• Connect the grid connector to the inverter. There should be a “click” sound, if it is plugged in correctly.	

3.4.2.2 GEN Connection

The GEN port can be connected to the PV inverter or generator, and the GEN port wiring method is the same as that described in "3.4.2.1 Grid Connection".
The GEN port limits of connecting the PV inverter and generator are described as follows:

Inverter Model	HYT/HAT-5.0HV-EUG1	HYT/HAT-6.0HV-EUG1	HYT/HAT-8.0HV-EUG1	HYT/HAT-10.0HV-EUG1	HYT-12.0HV-EUG1
Nominal Input Voltage of GEN Port (V)	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE	400/380, 3L/N/PE
Max. Input Current of GEN Port (A)	8.3	10	13.3	16.7	16.7
Recommended AC Breaker	16 A/400 V	16 A/400 V	20 A/400 V	25 A/400 V	25 A/400 V
Recommended Cable (mm^2)	4	4	4	4	4

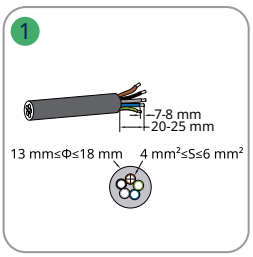
Note:

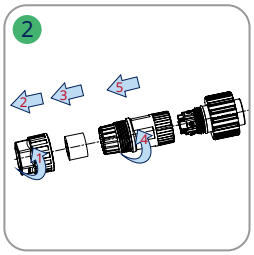
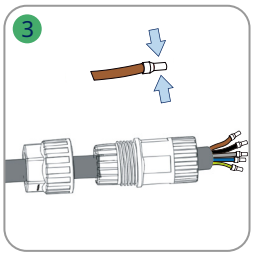
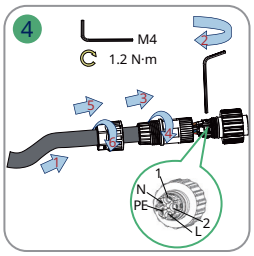
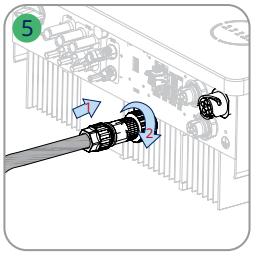
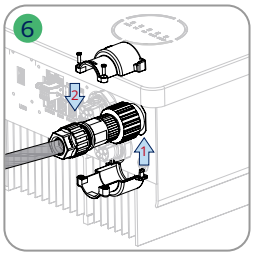
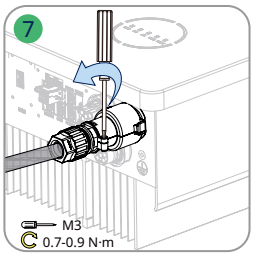
- Select the appropriate AC breaker in accordance with local laws and regulations.
- The grid-connected PV inverter connected must have overfrequency protection function.
- The single-phase microinverter can be connected to the HAT series inverter.

3.4.2.3 EPS Connection

HYT/HAT-HV series has on-grid and off-grid functions. The inverter will transmit power through the GRID port when the grid is on, and it will transmit power through the EPS port when the grid is off.
A standard PV installation typically consists of connecting the inverter to both panels and batteries. When the system is not connected to the batteries, the manufacturer strongly advises that the backup function shall not be used. The manufacturer will not honor the standard warranty and will not be liable for any consequences arising from users not following this instruction.

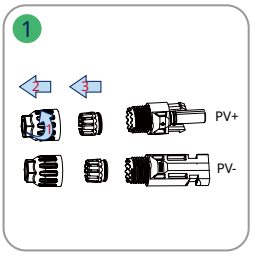
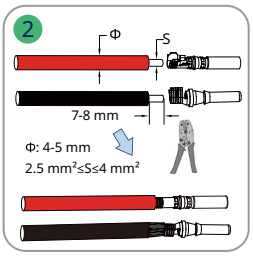
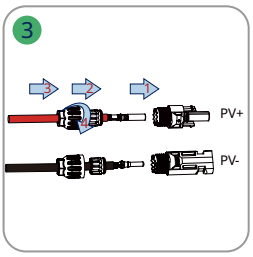
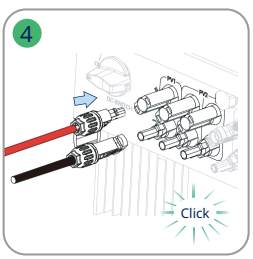
WARNING	Before connecting the EPS, please make sure all requirements listed below are followed. • Use the EPS connector from the accessory box. Damage to the device due to the use of an incompatible connector shall not be covered by the warranty. • An independent three or four-pole circuit breaker must 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 the EPS load power rating is within the EPS output rating, otherwise, the inverter will shut down with an "overload" warning.

Procedure		
Step 1	• Remove the cable jacket by 20-25 mm, and strip the wire insulation by 7-8 mm. • The conductor cross-section area: 4-6 mm^2.	

Step 2	• Unscrew the EPS connector counterclockwise. • Disassemble the parts in sequence.	
Step 3	• Insert the cable conductor core into the terminals and crimp them tightly. Make sure the cable jacket is not locked within the connector. • Thread the AC cable of appropriate length through the waterproof terminal.	
Step 4	• Fix all cables to the corresponding terminals with a torque of 1.2 N•m using the screwdriver according to the markings on the connector. Make sure the L1/L2/L3/N/PE cables are correctly assembled. (The correspondence between the terminals and cables is 2-L1, L-L2, and 1-L3.) • Assemble the parts in sequence. • Tighten the waterproof terminal clockwise.	
Step 5	• Connect the EPS connector to the inverter and tighten it.	
Step 6&7	• Install the EPS connector jacket to ensure that the EPS connector cannot be disassembled without tools.	 

3.4.3 PV Wiring Connection (only for HYT series inverters)

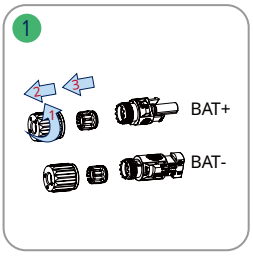
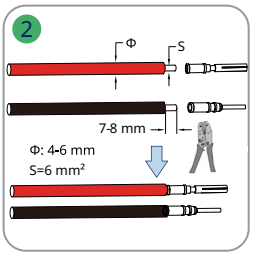
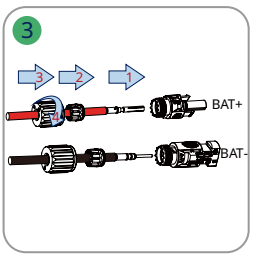
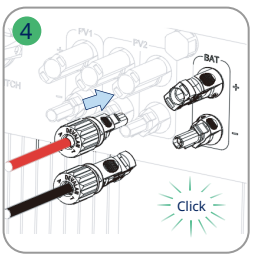
WARNING	Before connecting the PV, please make sure all requirements listed below are followed. • The voltage, current, and power ratings of the panels to be connected are within the allowable range of the inverter. Ensure the polarity is correct, and please refer to the technical parameters in Chapter 5 for voltage and current limits. • Since the inverter is a transformer-less structure, please do not ground the outputs of PV panels. • If the inverter is integrated with a PV switch, please make sure it is in the "OFF" position. Otherwise please use an external PV switch to cut off the PV connection during wiring and when necessary.
NOTICE	• Use the PV connectors in the accessory box for PV connections. Damage to the device due to the use of an incompatible terminal shall not be covered by the warranty. • Please make sure the connectors are correct, not the battery connectors, as they look similar.

Procedure		
Step 1	• Unscrew the PV connector counterclockwise. • Remove the insulator. • Remove the inner cable gland.	
Step 2	• Strip the insulation from each DC cable by 7-8 mm. • The conductor cross-sectional area: 2.5-4 mm². • Assemble cable ends with crimp contacts by PV terminal crimping tool.	
Step 3	• Lead the cable through the cable gland. • Insert the crimp contact into the insulator until it snaps into place. • Gently pull the cable backward to ensure a firm connection. • Tighten the cable gland and the insulator.	
Step 4	• Check the cable connection of the PV string for polarity correctness and ensure that the open-circuit voltage in any case does not exceed the inverter input limit of 1,000 V. • Connect the PV connectors to the inverter. There should be a "click" sound if they are plugged in correctly.	

3.4.4 Battery Wiring Connection

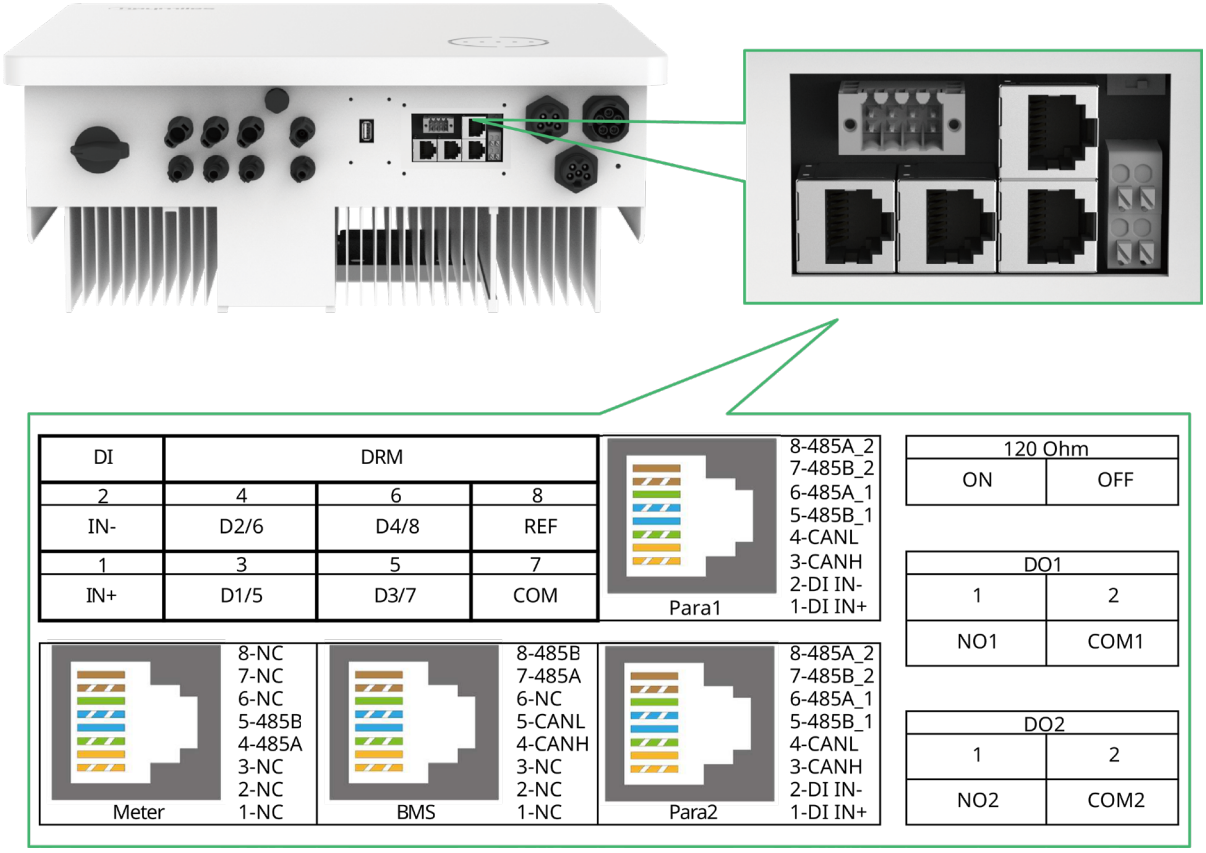
This section mainly describes the cable connections on the inverter side. Refer to the instructions supplied by the battery manufacturer for the connections on the battery side.
For batteries without a built-in DC breaker, make sure that an external DC breaker is connected.
If you need to use this hybrid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

WARNING	• A two-pole DC breaker with over current 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.
NOTICE	• Use the battery connectors in the accessory box for battery connections.

Procedure		
Step 1	• Unscrew the battery connector counterclockwise. • Remove the insulator. • Remove the inner cable gland.	
Step 2	• Strip the insulation from each DC cable by 7-8 mm. • The conductor cross-sectional area: 6 mm². • Assemble cable ends with crimp contacts by hydraulic pliers.	
Step 3	• Check the cable connection of the battery for polarity correctness and ensure that the open-circuit voltage in any case does not exceed the input limit of 600 V.	
Step 4	• Connect the battery connectors to the inverter. There should be a “click” sound if they are plugged in correctly.	

3.4.5 Communication Wiring Connection

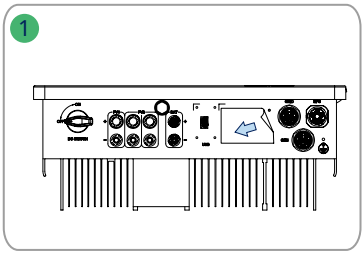
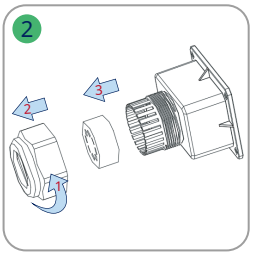
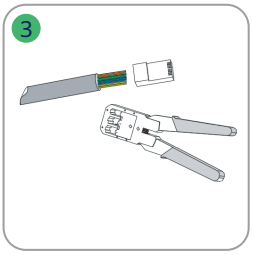
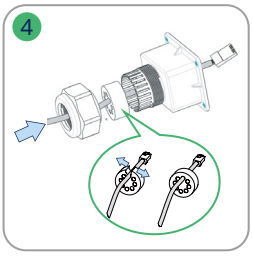
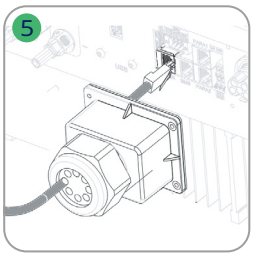
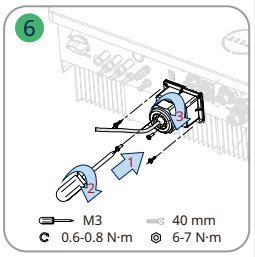
Detailed pin functions of each port on the communication interface are as follows.



Label	Description
Meter (485A, 485B)	For the smart meter.
BMS (CANH, CANL, 485A, 485B)	For Li-ion batteries, communication is via CAN or RS485.
DRM (D1/5, D2/6, D3/7, D4/8, COM, REF)	For external Demand Response Enabling Device.
DI (IN+, IN-)	Dry contact input of external bypass contactor.
Parallel (DI IN+, DI IN-, CANH, CANL, 485B_1, 485A_1, 485B_2, 485A_2)	For parallel operation.
120 Ohm (ON, OFF)	120 Ohm termination resistor for parallel operation.
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.

3.4.5.1 BMS Connection

NOTICE	• Connection of communication box is mandatory whether it is wired or not.

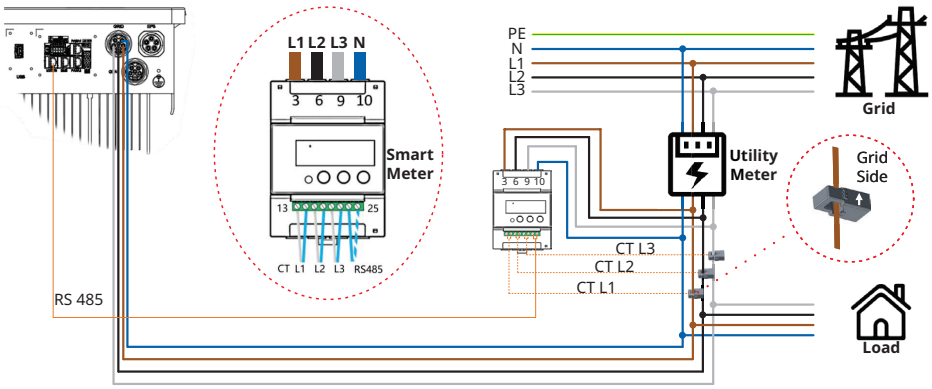
Procedure		
Step 1	• Peel the stickers off from the communication port.	
Step 2	• Unscrew the communication box counterclockwise. • Disassemble the parts in sequence.	
Step 3	• Strip the insulation layer of the communication cable with an ethernet wire stripper, and lead the corresponding signal cables out. Insert the stripped communication cable into the RJ45 plug in the correct order, and crimp it with a network cable crimper. • The pin definitions of BMS or battery sensor are shown in "3.4.5 Communication Wiring Connection".	
Step 4	• Thread the cable of an appropriate length through the communication box. • Clip the ethernet cable into the rubber ring.	
Step 5&6	• Insert the RJ45 plug into the BMS port until it clicks into place. • Tighten the cable gland. • Install the communication box with screws. • Connect the other end of the BMS cable to the battery, following the battery's manual instructions.	 

3.4.5.2 Smart Meter and CT Connection

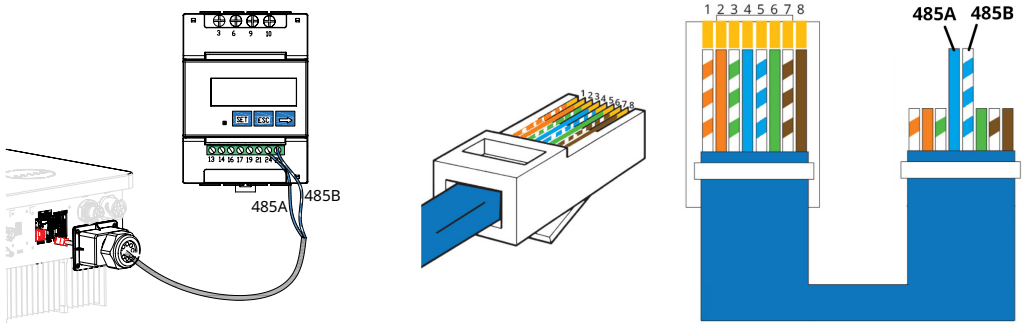
The smart meter and CT in the accessory box are necessary for system installation and are used to provide the operating condition of the inverter via RS485 communication.

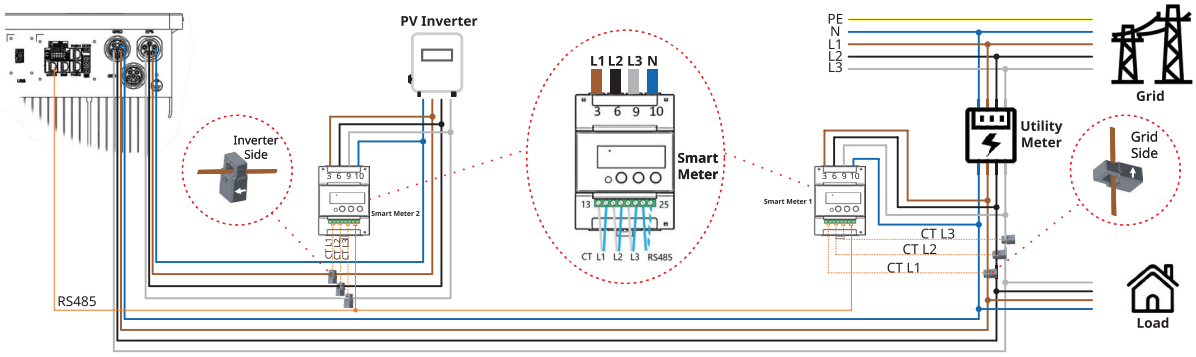
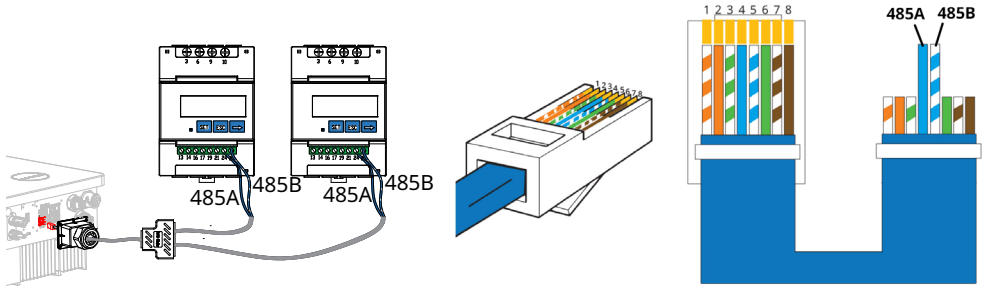
WARNING	Before connecting the smart meter and CT, ensure that the AC cable is totally isolated from the AC power source.
NOTICE	• One smart meter can be used with only one inverter. • Three CTs must be used for one smart meter and must be connected on the same phase with the smart meter power cable. • There is a symbol (arrow) or label on the surface of CTs that indicates the correct mechanical orientation of the CT on the conductor under measurement. Please identify the arrow or label before installing the CT. • Two smart meters are required for the installation of an AC-coupled system. 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 1, and the address of the grid side meter is set to 2.

Procedure (for HYT series inverters)	
Step 1	• Place the smart meter in or near the grid distribution box, right after the utility meter. • Connect grid L1/L2/L3/N to meter's terminals 3/6/9/10. • Clamp three CTs to L1/L2/L3 and connect wirings to 13/14, 16/17, and 19/21 respectively. The arrow on the surface of CT should point to the grid.



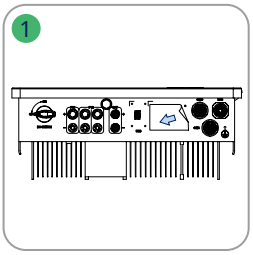
Step 2	• Connect the communication cable between the inverter and the smart meter.

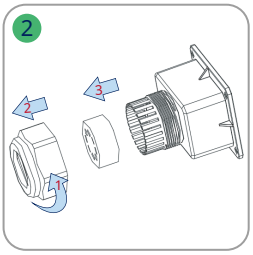
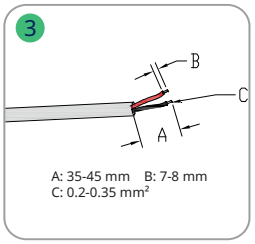
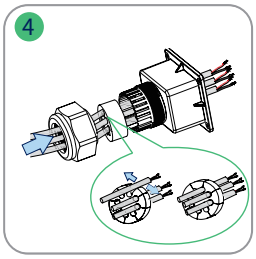
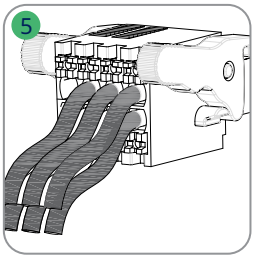
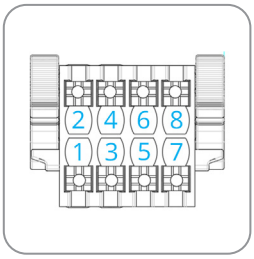
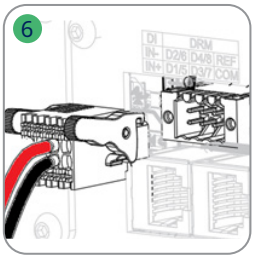
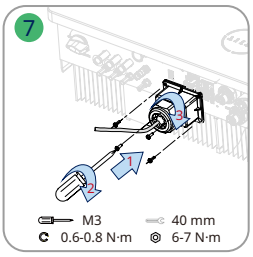


Procedure (for HAT series inverters)	
Step 1	• Place the smart meter 1 and 2 in or near the grid distribution box, right after the utility meter. • Smart meter 1 is connected to the grid side, and the arrow on the surface of CT should point to the grid. • If the PV inverter is connected to the EPS port, GEN port, or GRID port, smart meter 2 should be connected to the corresponding EPS side, GEN side, or GRID side, and the arrow on the surface of CT should point to the opposite direction of PV inverter. (The diagram below takes the EPS port as an example.) The connection method is the same as that described above.
	
Step 2	• Connect the communication cable between the inverter and the smart meter.
	

3.4.5.3 DRM Connection

DRM is designed to support several demand response modes by certain control signals, which is used for Australia and New Zealand. Detailed connection of DRM is shown below.

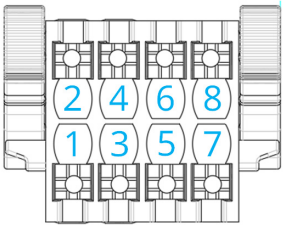
Procedure		
Step 1	• Peel the stickers off from the communication port.	

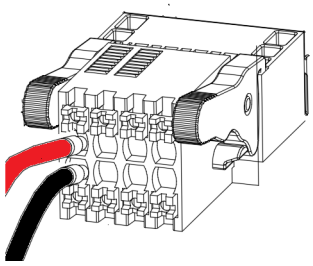
<table>
<tr><td>Step 2</td><td>• Unscrew the communication box counterclockwise.
• Disassemble the parts in sequence.</td><td>  </td></tr>
<tr><td>Step 3</td><td>• Strip the insulation layer of the communication cable, and lead the corresponding signal cables out. Press the terminal.</td><td>  </td></tr>
<tr><td>Step 4</td><td>• Thread the cable of an appropriate length through the communication box.
• Clip the cable into the rubber ring.</td><td>  </td></tr>
<tr><td>Step 5</td><td>• Plug the wires into the terminal block firmly according to the following tables.</td><td>   </td></tr>
<tr><td>Step 5</td><td>• For DRED, wiring from the No.3 to No.8 holes. The function of each connection position is shown below.<table><tr><td>NO.</td><td>4</td><td>6</td><td>8</td></tr><tr><td>Function</td><td>DRM2/6</td><td>DRM4/8</td><td>REFGEN</td></tr><tr><td>NO.</td><td>3</td><td>5</td><td>7</td></tr><tr><td>Function</td><td>DRM1/5</td><td>DRM3/7</td><td>COM/DRM0</td></tr></table></td><td>• For Remote Shutdown, wiring the No.7 and No.8 holes. The function of each connection position is shown below.<table><tr><td>NO.</td><td>8</td></tr><tr><td>Function</td><td>REFGEN</td></tr><tr><td>NO.</td><td>7</td></tr><tr><td>Function</td><td>COM/DRM0</td></tr></table></td></tr>
<tr><td>Step 6</td><td>• Pull the wires outward to check whether they are fully inserted and cannot be pulled out easily.
• Insert the terminal block into the connector until the terminal block clicks into place.</td><td>  </td></tr>
<tr><td>Step 7</td><td>• Tighten the cable gland.</td><td>  </td></tr>
</table>

3.4.5.4 DI Connection

There is an integrated DI (IN+, IN-) as the dry contact input to the bypass contactor of the inverter. The connection method is the same as that described in "3.4.5.3 DRM Connection". Wiring the No.1 and No.2 holes if used, and the function of each connection position is shown below.

NO.	2
Function	IN-
NO.	1
Function	IN+

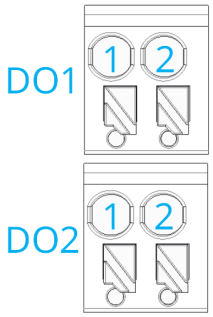


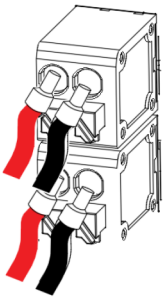


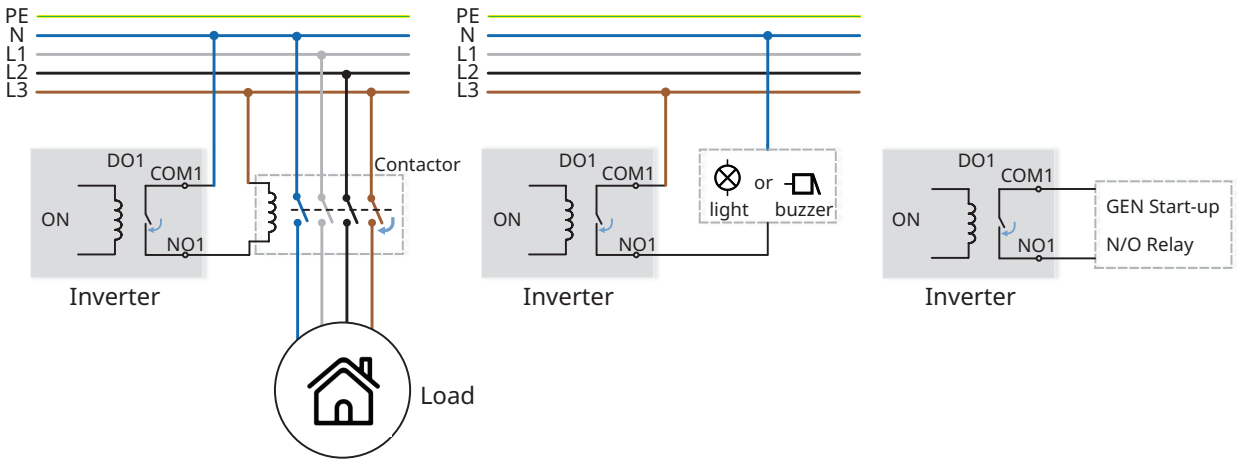
3.4.5.5 DO Connection

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 used, and for more information, please contact Hoymiles technical support team. The connection method is the same as that described in "3.4.5.3 DRM Connection". The function of each connection position is shown below.

NO.	DO1 - 1	DO1 - 2
Function	NO1	COM1
NO.	DO2 - 1	DO2 - 2
Function	NO2	COM2



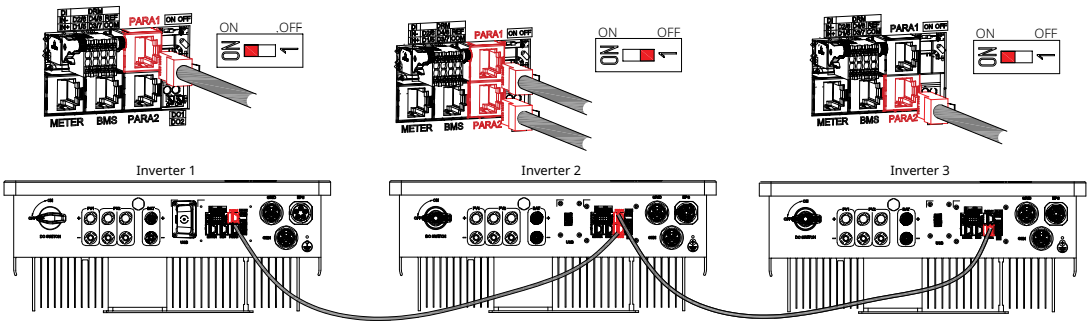


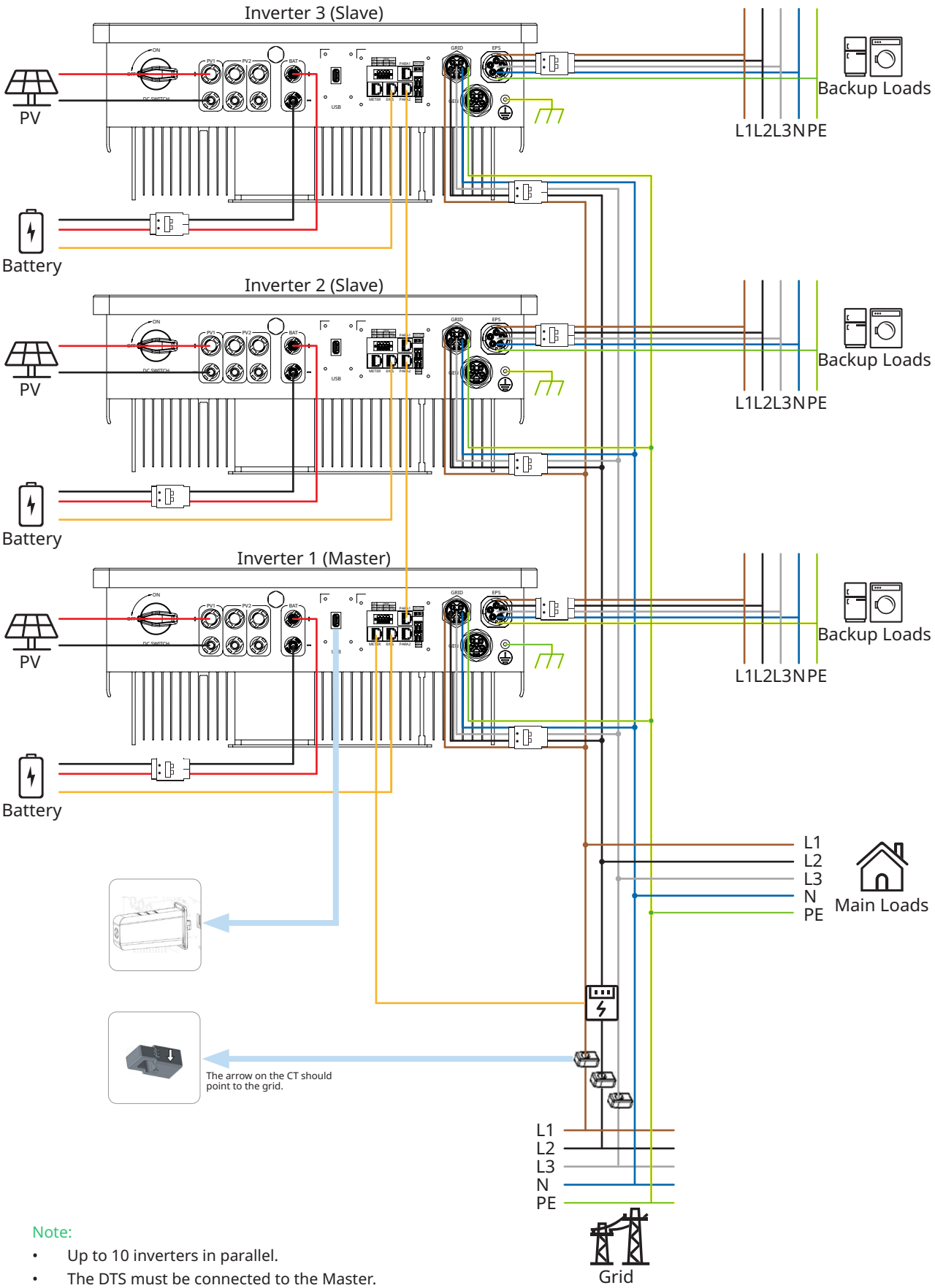


DO1-Load Control DO1-Earth Fault Alarm DO1-Generator Control

3.4.5.6 Parallel Connection

As shown in the figure, parallel operation is performed through the PARA1/PARA2 interface. When inverters are used in parallel, the first and the last inverters are "ON", and the others are "OFF".

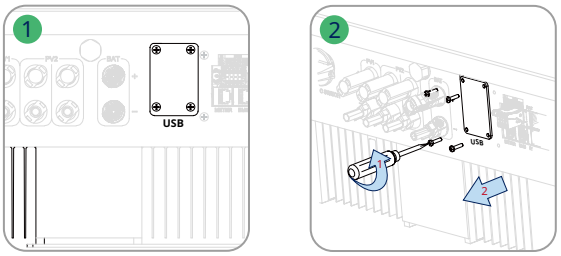
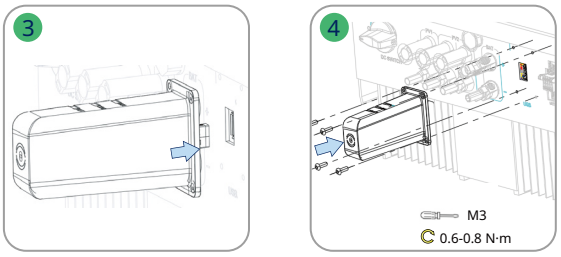
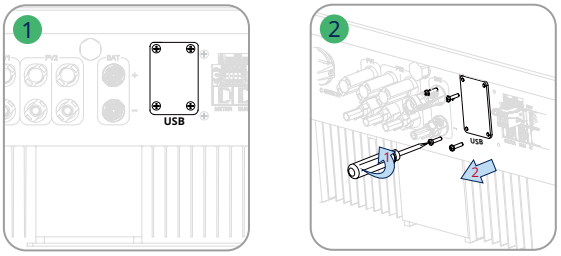
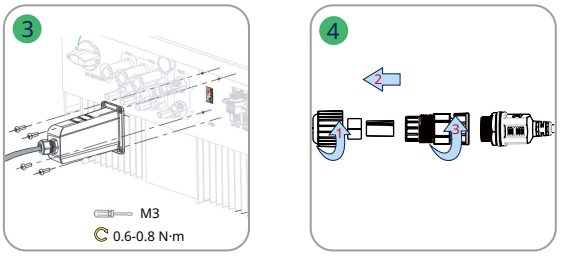
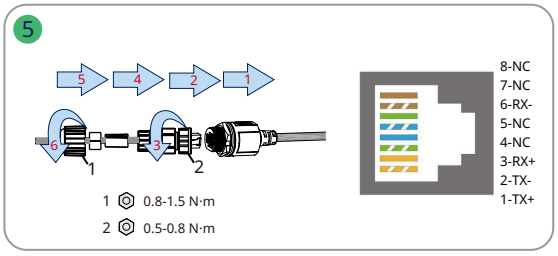




Note:

- Up to 10 inverters in parallel.
- The DTS must be connected to the Master.
- Each inverter must be connected to an independent battery which can be set separately.
- This series of inverters with different powers can be connected in parallel.
- PV is only for HYT-(5.0-12.0)HV-EUG1 inverters.
- 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.

3.4.6 DTS Connection

<table>
<tr><td colspan="3">DTS-WIFI-G1 and DTS-4G-G1 Procedure</td></tr>
<tr><td>Step 1&2</td><td>• Remove the DTS port cover plate.</td><td> 
</td></tr>
<tr><td>Step 3&4</td><td>• Insert the DTS into the USB port.
• Fasten the screws.</td><td> 
</td></tr>
<tr><td colspan="3">DTS-Ethernet-G1 Procedure</td></tr>
<tr><td>Step 1&2</td><td>• Remove the DTS port cover plate.</td><td> 
</td></tr>
<tr><td>Step 3&4</td><td>• Insert the DTS-Ethernet into the USB port, and fasten the screws.
• Unscrew the swivel nut from the connector.</td><td> 
</td></tr>
<tr><td>Step 5</td><td>• Insert the RJ45 plug (pin definition is shown in the right figure) into the connector until there is an audible click sound.
• Thread the cable of an appropriate length through the connector.
• Tighten the cable gland.</td><td> 
</td></tr>
</table>

Note: The RJ45 plug with cable sheath cannot be inserted.

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.

3.5 Operation

3.5.1 Commissioning

	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 Wiring 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 the 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	(Only for HYT series inverters) 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

	After powering off the inverter, follow the steps below if needed: • Wait at least 10 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, 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	(Only for HYT series inverters) 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.

3.5.3 S-Miles Cloud App

The S-Miles Cloud App has been developed for the 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

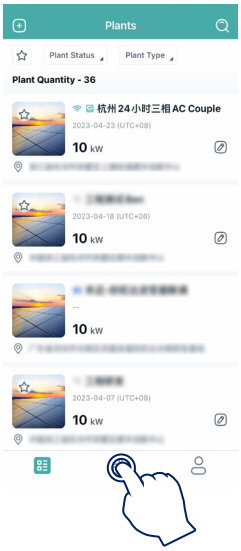
3.5.3.1 DTS Online Setting

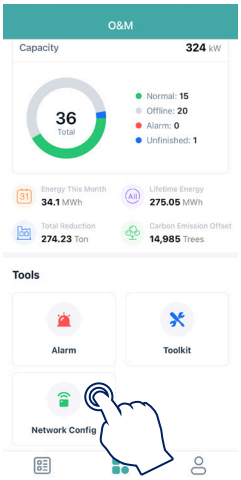
1. Search “Hoymiles” in the App Store (iOS) or the Play Store (Android), or scan the QR code to download the Hoymiles Installer App.

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.

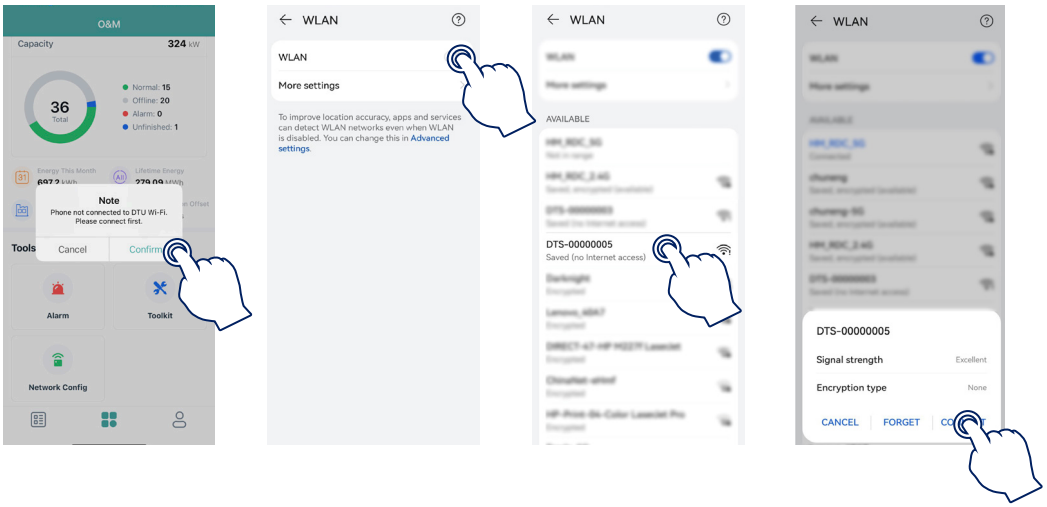
3. Use the App to connect to the DTS.

(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”.





(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.)

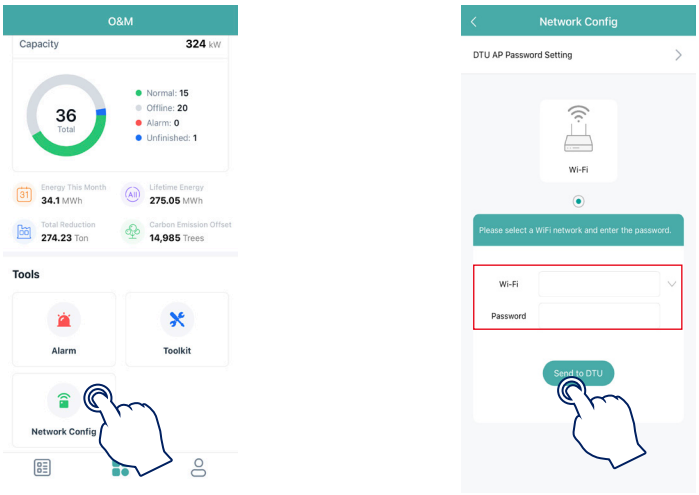


4. Network configuration.

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

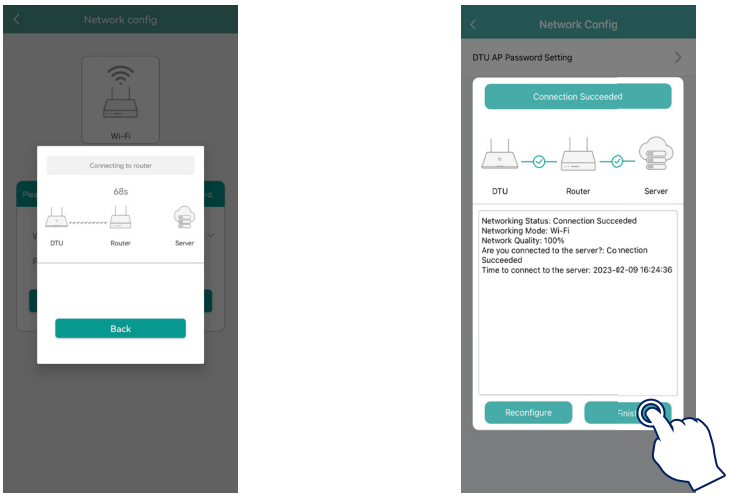
(b) Select the router Wi-Fi and enter the password.

(c) Tap on "Send to DTU".



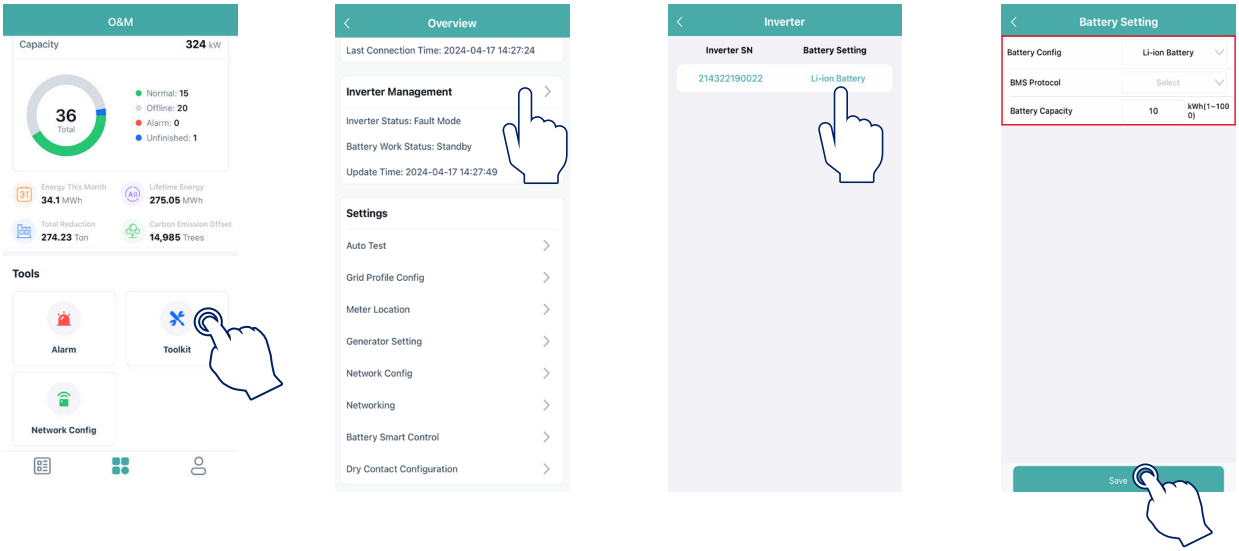
5. Check the DTS indicator for a solid blue light, which signifies a successful connection.

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

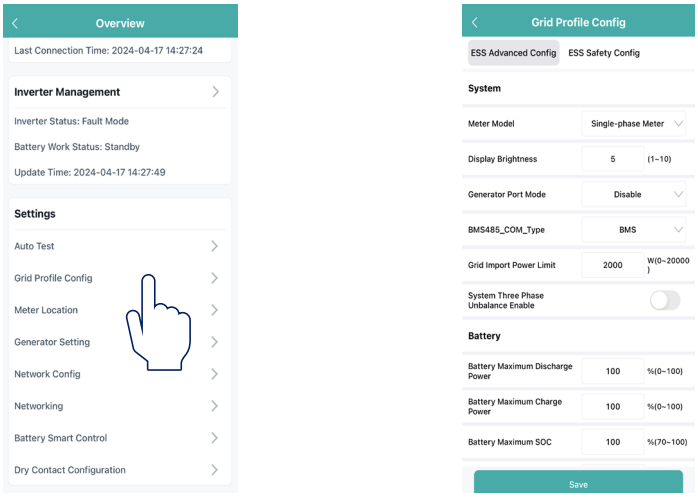


3.5.3.2 System Commissioning of Wireless Access Point (AP) Connection

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”.)



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”.



★ 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%
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)

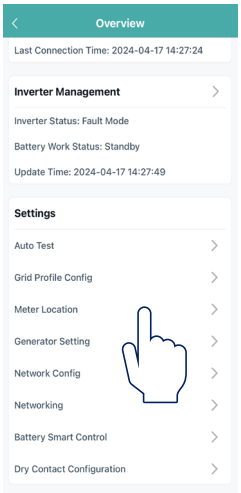
Parameter	Description	Default Value
EPS Mode	When the EPS port is connected, you can choose “EPS” or “UPS”. You can choose “UPS” when the load keeps power on, and the on-grid mode and off-grid mode will automatically switch to each other under UPS mode.	EPS
	EPS is characterized by the continuous power 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

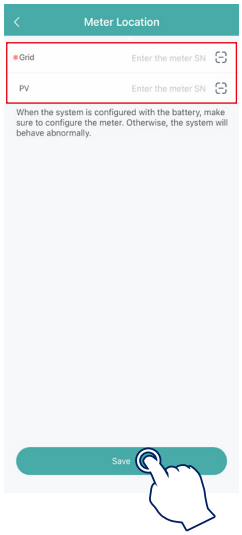
★ Generator Setting

Parameter	Range	Default Value
Generator Position	None/GenSide/GridSide	None
Generator Signal Type	Manual/DI/DO	Manual
Generator Minimum Run Time	0-60 min	10 min
Generator Maximum Run Time	0-10 hr	8 hr
Generator Protection Interval	0-60 min	10 min

Generator Synchronized Time	0-20 min	5 min
Generator Shutdown Delay	0-20 min	5 min
Generator Exercise Mode Interval	0-60 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	0-65 Hz	/
Generator Low Frequency Limit	0-59 Hz	/

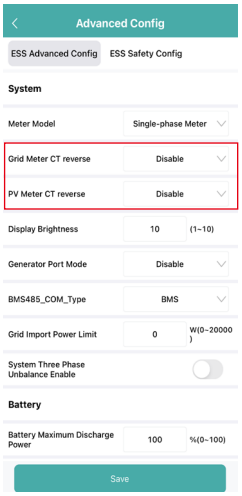
3. Tap “Meter Location” to configure the grid side meter. The serial number (SN) can be entered manually or identified through scanning the QR code. If the GEN port is connected to the PV inverter, the PV side meter also needs to be configured.

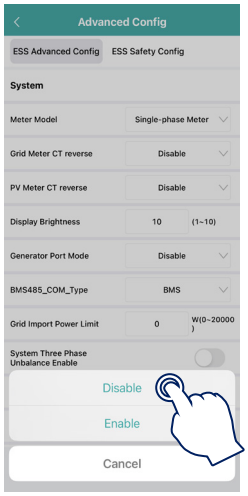




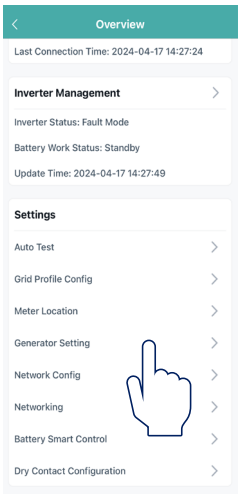
Note:

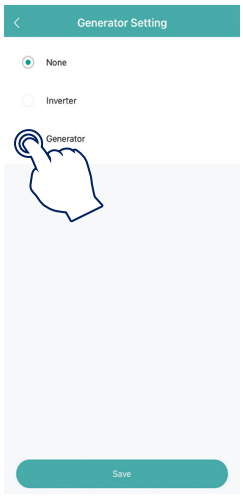
Check whether the direction of CT is correct. If the CT is reversely connected, choose the plant, tap “Advanced Config → Grid Meter CT reverse → Enable” or “PV Meter CT reverse → Enable” to get the correct sampling current, and tap “Save”.



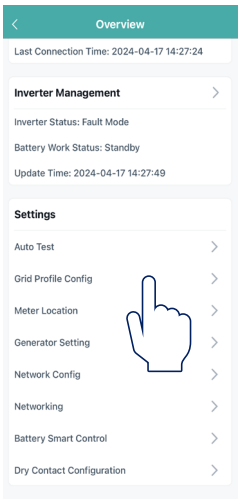


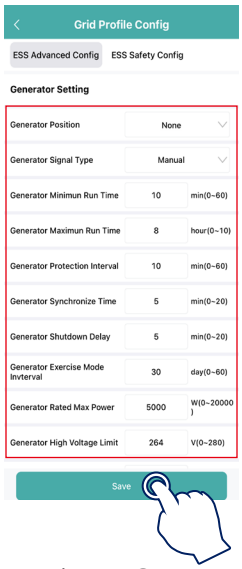
4. Tap “Generator Setting”, choose the corresponding option according to whether the device connected to the GEN port is “Inverter” or “Generator”, and tap “Save”. (The default option is “None”.)



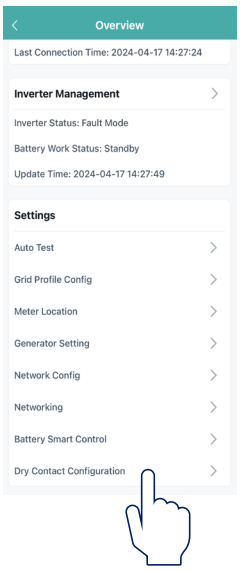


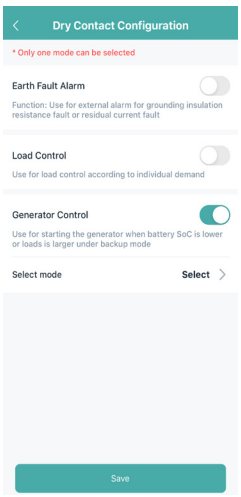
(a) If the GEN port is connected to the generator, tap “Grid Profile Config → ESS Advanced Config”, slide your finger up to set generator parameters, and tap “Save”. For detailed parameters, please refer to NO.2 Generator Setting.

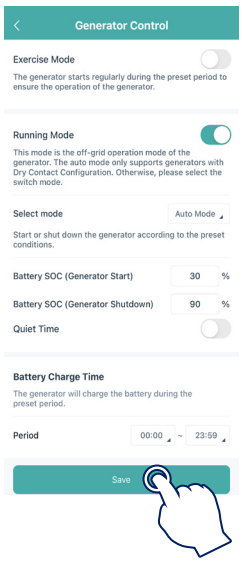




After setting the generator parameters, tap “Dry Contact Configuration → Generator Control” to set its mode and corresponding parameters, and tap “Save”.







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

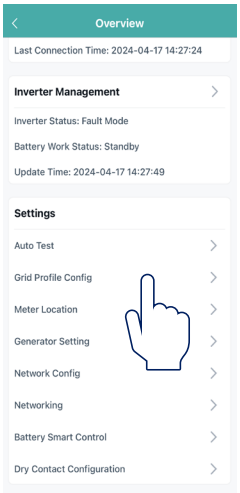
Description: The generator will charge the battery during the preset period.

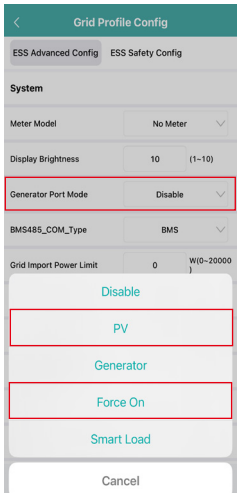
(b) If the GEN port is connected to the PV inverter, ensure that the PV side meter must be configured.

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.

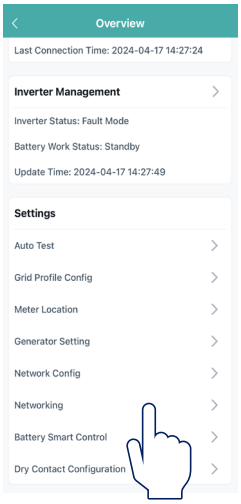
Secondly, check if the address, baud rate, data bits, and check digit are consistent with the master, if not, correct the wrong one. Note that the address of the PV side meter should be set to 001, and its corresponding data bits should be set to n1-9600.

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

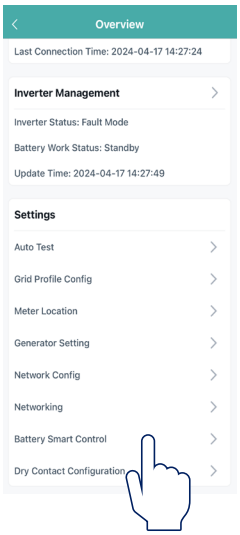


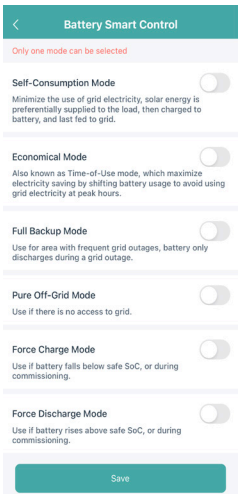


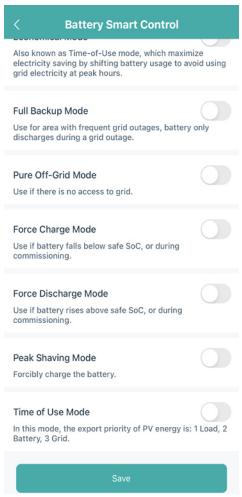
5. Tap “Networking” to access to the networking page, and tap “Networking” at the bottom left corner to perform parallel operation. The inverter connected to the DTS is the master, and the others are slaves. After the slaves are connected to the master through a communication cable, they can communicate 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, Economical Mode, Full Backup Mode, Pure Off-Grid Mode, Force Charge Mode, Force Discharge Mode, Peak Shaving Mode, and Time of Use Mode.







★ 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”.

★ Economical 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.

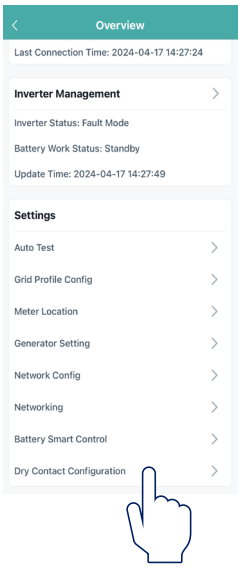
★ Peak Shaving Mode

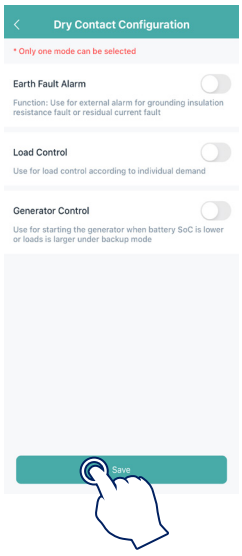
In this mode, the Peak Meter Power (the maximum power that the inverter obtains from the grid) can be set; only when PV and battery can fully supply the loads, can the Peak Meter Power be limited. Set the Peak Capacity to ensure the normal operation of this mode. When the battery SOC is less than the 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.

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 five 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.

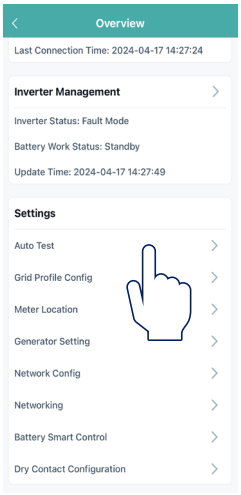
(4) **Backup Load Smart Control:** The unnecessary dry contact will be turned off in off-grid situation when the battery capacity is lower than the set SOC value. You can set the value of protection SOC if needed.

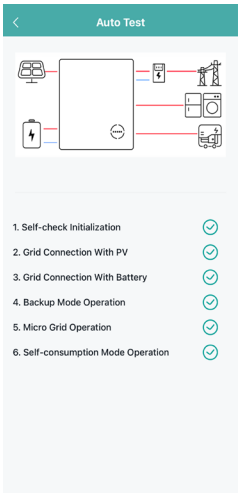
(5) **EV Charger Smart Control:** In this mode, whether to start the EV charger can be determined based on the total input current. When the input current is less than the value of the entrance breaker size minus the EV Charger size, the EV Charger is allowed to work; when the input current is larger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

★ 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.





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.
RCD 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.

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.
ISO 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 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.

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 Self-check 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.

5. Technical Datasheet

5.1 HYT-(5.0-12.0)HV-EUG1

Model	HYT-5.0HV-EUG1	HYT-6.0HV-EUG1	HYT-8.0HV-EUG1	HYT-10.0HV-EUG1	HYT-12.0HV-EUG1
Battery					
Battery type	Li-ion				
Battery voltage range (V)	170-600				
Max. charge/discharge current (A)	20/20	20/20	30/30	30/30	30/30
Max. charge/discharge power (W)	5000/5000	6000/6000	8000/8000	10000/10000	10000/10000
Charging strategy for Li-ion battery	Self-adaption to BMS				
Communication	CAN, RS485				
PV Input					
Recommended max. PV power (W)	7500	9000	12000	15000	15000
Max. input voltage (V)	1000				
Rated voltage (V)	720				
Start-up voltage (V)	250				
MPPT voltage range (V)	200-950				
Max. input current (A)	14/14	14/14	14/14	14/28	14/28
Max. short circuit current (A)	17/17	17/17	17/17	17/34	17/34
MPPT number/Max. input strings number	2/2	2/2	2/2	2/3	2/3
AC Input and Output (On-grid)					
Rated output power (W)	5000	6000	8000	10000	12000
Max. output apparent power (VA)	5500	6600	8800	11000	12000
Max. input power (W)	10000	12000	16000	16000	16000
Grid form	3L/N/PE				
Rated AC output voltage/Range (V)	380/400, 266-480				
Rated grid frequency (Hz)	50/60				
Max. output current (A)	8.3	10.0	13.3	16.7	17.4
Max. input current (A)	15.2	18.2	24.2	24.2	24.2
Power factor	>0.99 (0.8 leading ... 0.8 lagging)				
THDi (@rated output)	<3%				
AC Output (Off-grid)					
Rated output power (W)	5000	6000	8000	10000	12000
Max. output apparent power (VA)	10000, 10s	12000, 10s	16000, 10s	16000, 10s	16000, 10s
Back-up switch time (ms)	<10				
Grid form	3L/N/PE				
Rated output voltage (V)	380/400				
Rated output frequency (Hz)	50/60				
Max. continuous output current (A)	8.3	10.0	13.3	16.7	17.4
THDv (@linear load)	<3%				
Efficiency					
MPPT efficiency	99.9%	99.9%	99.9%	99.9%	99.9%
Max. efficiency	98.0%	98.0%	98.0%	98.0%	98.0%
EU efficiency	97.0%	97.1%	97.2%	97.4%	97.5%
Max. battery discharge to AC efficiency	97.5%	97.5%	97.5%	97.5%	97.5%
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 × 486 × 202				
Weight (kg)	26.5				
Mounting	Wall mounting				
Operating temperature (℃)	-25 to +65 (>45, derating)				
Relative humidity	0-95%, no condensing				
Cooling	Natural convection				
Topology (Solar/Battery)	Transformerless/Transformerless				
Altitude (m)	≤2000				
Protection degree	IP65				
Noise (dB)	<40				
User interface	LED, App				
Digital input/output	DRM, 1 × DI, 2 × DO				
Communication	RS485, optional: Wi-Fi/Ethernet/4G(1)				
Certifications and Standards					
Grid connection standard	EN 50549, VDE-AR-N 4105, AS/NZS 4777.2, VFR: 2019, TOR Erzeuger Type A, RD647, NTS (SENP), CEI 0-21 2019:04				
Safety/EMC standard	IEC 62109-1/-2, EN 61000-6-1/-3				

(1) The DTS-4G solution will be coming soon.

5.2 HAT-(5.0-10.0)HV-EUG1

Model	HAT-5.0HV-EUG1	HAT-6.0HV-EUG1	HAT-8.0HV-EUG1	HAT-10.0HV-EUG1
Battery				
Battery type	Li-ion			
Battery voltage range (V)	170-600			
Max. charge/discharge current (A)	20/20	20/20	30/30	30/30
Max. charge/discharge power (W)	5000/5000	6000/6000	8000/8000	10000/10000
Charging strategy for Li-ion battery	Self-adaption to BMS			
Communication	CAN, RS485			
AC Input and Output (On-grid)				
Rated output power (W)	5000	6000	8000	10000
Max. output apparent power (VA)	5500	6600	8800	11000
Max. input power (W)	10000	12000	16000	16000
Grid form	3L/N/PE			
Rated AC output voltage/Range (V)	380/400, 266-480			
Rated grid frequency (Hz)	50/60			
Max. output current (A)	8.3	10.0	13.3	16.7
Max. input current (A)	15.2	18.2	24.2	24.2
Power factor	>0.99 (0.8 leading ... 0.8 lagging)			
THDi (@rated output)	<3%			
AC Output (Off-grid)				
Rated output power (W)	5000	6000	8000	10000
Max. output apparent power (VA)	10000, 10s	12000, 10s	16000, 10s	16000, 10s
Back-up switch time (ms)	<10			
Grid form	3L/N/PE			
Rated output voltage (V)	380/400			
Rated output frequency (Hz)	50/60			
Max. continuous output current (A)	8.3	10.0	13.3	16.7
THDv (@linear load)	<3%			
Efficiency				
Max. efficiency	97.5%	97.5%	97.5%	97.5%
Protection				
Anti-islanding protection	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 × 486 × 202			
Weight (kg)	23			
Mounting	Wall mounting			
Operating temperature (°C)	-25 to +65 (>45, derating)			
Relative humidity	0-95%, no condensing			
Cooling	Natural convection			
Topology (Battery)	Transformerless			
Altitude (m)	≤2000			
Protection degree	IP65			
Noise (dB)	<40			
User interface	LED, App			
Digital input/output	DRM, 1 × DI, 2 × DO			
Communication	RS485, optional: Wi-Fi/Ethernet/4G(1)			
Certifications and Standards				
Grid connection standard	EN 50549, VDE-AR-N 4105, AS/NZS 4777.2, VFR: 2019, TOR Erzeuger Type A			
Safety/EMC standard	IEC 62109-1/-2, IEC 62477-1, EN 61000-6-1/-3			

(1) The DTS-4G solution will be coming soon.

Appendix A

HYT-(5.0-12.0)HV-EUG1 Grid Code:

National/Regional Grid Code	Description	HYT-5.0HV-G1	HYT-6.0HV-G1	HYT-8.0HV-G1	HYT-10.0HV-G1	HYT-12.0HV-G1
VDE-AR-N-4105	Germany HV power grid	Supported	Supported	Supported	Supported	Supported
UTE C 15-715-1(A)	France mainland power grid	Supported	Supported	Supported	Supported	Supported
UTE C 15-715-1(B)	France island power grid	Supported	Supported	Supported	Supported	Supported
UTE C 15-715-1(C)	France island power grid	Supported	Supported	Supported	Supported	Supported
CEI0-21	Italy power grid	Supported	Supported	Supported	Supported	Supported
C10/11	Belgium power grid	Supported	Supported	Supported	Supported	Supported
Austria	Austrian power grid	Supported	Supported	Supported	Supported	Supported
G98	UK G98 power grid	Supported	Supported	Supported	Supported	Supported
G99 TRPEA-HV	UK G99_ TRPEA_ HV power grid	Supported	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ A_HV400	Australia power grid	Supported	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ B_HV400	Australia power grid	Supported	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ C_HV400	Australia power grid	Supported	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ A_HV_NZ_400	New Zealand power grid	Supported	Supported	Supported	Supported	Supported
RD1699/166	Spain HV power grid	Supported	Supported	Supported	Supported	Supported
EN50549-poland	Poland power grid	Supported	Supported	Supported	Supported	Supported
IEC 62116	Hungary power grid	Supported	Supported	Supported	Supported	Supported
IEC 61683	Pakistan power grid	Supported	Supported	Supported	Supported	Supported
NRS 097-2-1	South Africa power grid	Supported	Supported	Supported	Supported	Supported

National/Regional Grid Code	Description	HYT-5.0HV-G1	HYT-6.0HV-G1	HYT-8.0HV-G1	HYT-10.0HV-G1	HYT-12.0HV-G1
TAI-PEA	Thailand power grid	Supported	Supported	Supported	Supported	Supported
TAI-MEA	Thailand power grid	Supported	Supported	Supported	Supported	Supported
ABNTNBR16149	Brazil power grid	Supported	Supported	Supported	Supported	Supported
IEC61727	IEC61727 HV(50Hz)	Supported	Supported	Supported	Supported	Supported
IEC61727-60Hz	IEC61727 HV(60Hz)	Supported	Supported	Supported	Supported	Supported
EN50549 -1-Portugal deviation	Portugal power grid	Supported	Supported	Supported	Supported	Supported
EN50549-1-Hungary deviation	Hungary power grid	Supported	Supported	Supported	Supported	Supported
No. 25/2016/TT-BCT 2016	Vietnam power grid	Supported	Supported	Supported	Supported	Supported
DEWA:2016	United Arab Emirates power grid	Supported	Supported	Supported	Supported	Supported
TNB+IEC60068	--	Supported	Supported	Supported	Supported	Supported
AS 4777.2	Israel power grid	Supported	Supported	Supported	Supported	Supported
NOM	Mexico power grid	Supported	Supported	Supported	Supported	Supported
Ordinance 140	Brazil power grid	Supported	Supported	Supported	Supported	Supported
TOR Erzeuger Type A	Austria power grid	Supported	Supported	Supported	Supported	Supported
VFR: 2019	France power grid	Supported	Supported	Supported	Supported	Supported

HAT-(5.0-10.0)HV-EUG1 Grid Code:

National/Regional Grid Code	Description	HAT-5.0HV-EUG1	HAT-6.0HV-EUG1	HAT-8.0HV-EUG1	HAT-10.0HV-EUG1
VDE-AR-N-4105	Germany HV power grid	Supported	Supported	Supported	Supported
UTE C 15-715-1(A)	France mainland power grid	Supported	Supported	Supported	Supported
UTE C 15-715-1(B)	France island power grid	Supported	Supported	Supported	Supported
UTE C 15-715-1(C)	France island power grid	Supported	Supported	Supported	Supported
CEI0-21	Italy power grid	Supported	Supported	Supported	Supported
C10/11	Belgium power grid	Supported	Supported	Supported	Supported
Austria	Austrian power grid	Supported	Supported	Supported	Supported
G98	UK G98 power grid	Supported	Supported	Supported	Supported
G99 TRPEA-HV	UK G99_ TRPEA_ HV power grid	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ A_HV400	Australia power grid	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ B_HV400	Australia power grid	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ C_HV400	Australia power grid	Supported	Supported	Supported	Supported
AUSTRALIA-AS4777_ NZ_HV400	New Zealand power grid	Supported	Supported	Supported	Supported
RD1699/166	Spain HV power grid	Supported	Supported	Supported	Supported
EN50549-poland	Poland power grid	Supported	Supported	Supported	Supported
IEC 61683	Pakistan power grid	Supported	Supported	Supported	Supported

National/Regional Grid Code	Description	HAT-5.0HV-EUG1	HAT-6.0HV-EUG1	HAT-8.0HV-EUG1	HAT-10.0HV-EUG1
TAI-PEA	Thailand power grid	Supported	Supported	Supported	Supported
TAI-MEA	Thailand power grid	Supported	Supported	Supported	Supported
ABNTNBR16149	Brazil power grid	Supported	Supported	Supported	Supported
IEC61727	IEC61727 HV(50Hz)	Supported	Supported	Supported	Supported
IEC61727-60Hz	IEC61727 HV(60Hz)	Supported	Supported	Supported	Supported
EN50549 -1-Portugal deviation	Portugal power grid	Supported	Supported	Supported	Supported
EN50549-1-Hungary deviation	Hungary power grid	Supported	Supported	Supported	Supported
No. 25/2016/TT-BCT 2016	Vietnam power grid	Supported	Supported	Supported	Supported
DEWA:2016	United Arab Emirates power grid	Supported	Supported	Supported	Supported
TNB+IEC60068	--	Supported	Supported	Supported	Supported
AS 4777.2	Israel power grid	Supported	Supported	Supported	Supported
NOM	Mexico power grid	Supported	Supported	Supported	Supported
VFR: 2019	France power grid	Supported	Supported	Supported	Supported

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