



USER MANUAL

HYS-3.0LV-EUG1
HYS-3.6LV-EUG1
HYS-4.6LV-EUG1
HYS-5.0LV-EUG1
HYS-6.0LV-EUG1

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1. Safety Introduction

1.1 Explanation of Symbols

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

Symbol	Usage
	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk that, if not avoided, can result in death or serious injury.
	Indicates a hazard with a low level of risk that, if not avoided, can result in minor or moderate injury.
	Indicates a situation that, if not avoided, can result in property damage. NOTICE is used to address practices not related to personal injury.
	Caution! Failure to observe any warnings contained in this manual may result in injury.
	Danger to life due to high voltages! Only qualified personnel can open and maintain the inverter.
	Burn danger due to hot surface that may exceed 60°C.
	Refer to the operating instructions.
	Wait for at least 10 minutes before opening the inverter or touching live parts.
	Products shall not be disposed as household waste.
	CE mark.

	<p>This side up! This package must always be transported, handled and stored in such a way that the arrows always point upwards.</p>
	<p>Fragile - The package/product should be handled carefully and should never be tipped over or slung.</p>
	<p>Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.</p>
	<p>No more than six (6) identical packages are to be stacked on each other.</p>

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 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 Hoymile.

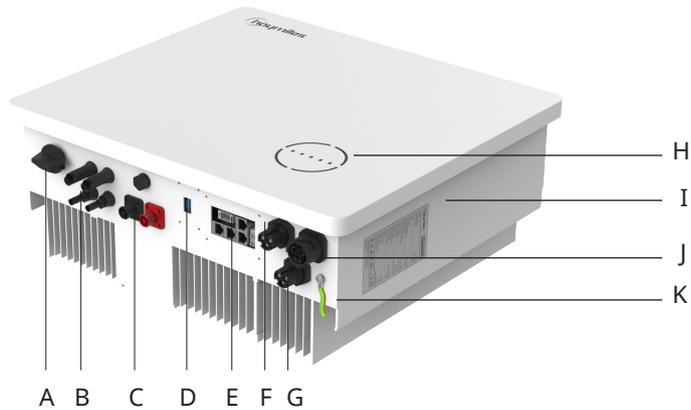
Symbol	Usage
	<p>Danger to life from electric shock</p> <ul style="list-style-type: none"> • Before performing any work on the inverter, disconnect all DC and AC power from inverter and wait for at least 10 minutes. Hazardous voltage will present for up to 10 minutes after disconnection from power supply. • Never insert or remove the AC or DC connections when the inverter is running. • Any live parts connected to battery port cannot be touched before removing all the power from inverter for 10 minutes because there is still danger to life even battery voltage is lower than 60V. • Do not touch DC conductors or any non-isolated cable ends. • The mounting location must be inaccessible to children. • Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both at the same time.
	<p>Risk of burns from hot surfaces</p> <ul style="list-style-type: none"> • The surface of the inverter might exceed 60°C , touching the surface may result in burns. • Do not touch hot surfaces before it cools down.

 <p>WARNING</p>	<ul style="list-style-type: none"> • 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 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, explosive materials to avoid fire disaster. • 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 has been disconnected. • When accessing the internal circuit of inverter, wait for at least 10 minutes.
 <p>CAUTION</p>	<ul style="list-style-type: none"> • The inverter has a transformerless design on 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 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.
 <p>NOTICE</p>	<ul style="list-style-type: none"> • 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 user-serviceable parts. See Warranty for instructions on obtaining service. • If an error occurs, contact your local distributor or qualified electricians.

2. Introduction

2.1 Product Overview

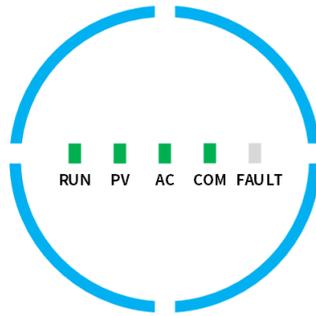
The HYS-LV Series is a high-performance single-phase hybrid inverter with excellent reliability. The intelligent EMS function supports self-consumption, economic, and backup modes for multi-scenario applications. Monitoring management through S-Miles Cloud allows users to remotely diagnose and track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



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

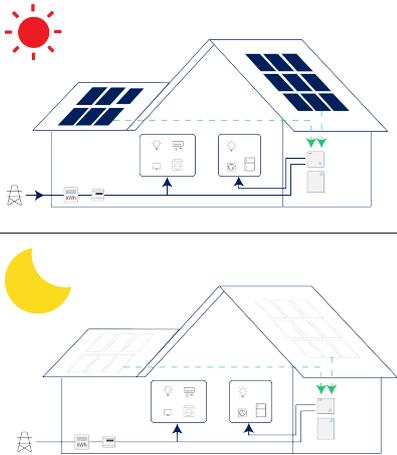
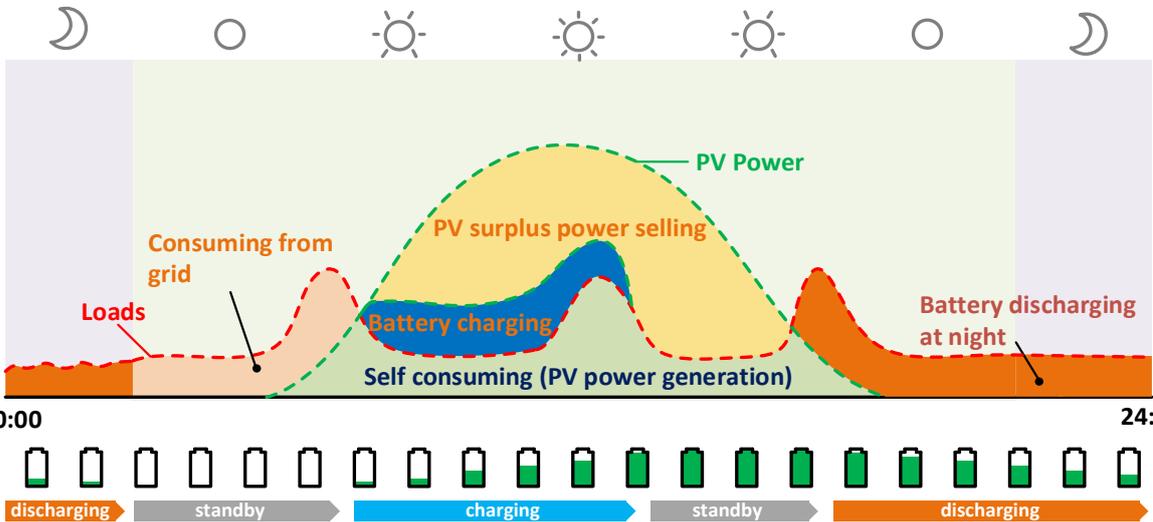
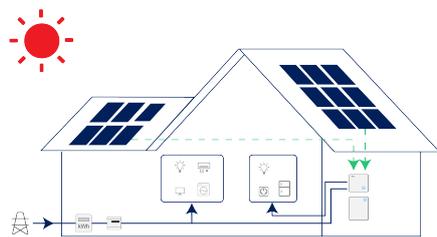
Object	Description
A	DC Switch
B	PV Terminals
C	Battery Terminals
D	Data Transfer Stick (DTS) Port
E	Communication Port
F	GRID Connector
G	Generator (GEN) Connector
H	LED Indicators
I	Label
J	Emergency Power Supply (EPS) Connector
K	PE Terminal
	<ul style="list-style-type: none"> Prior to any electrical 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.

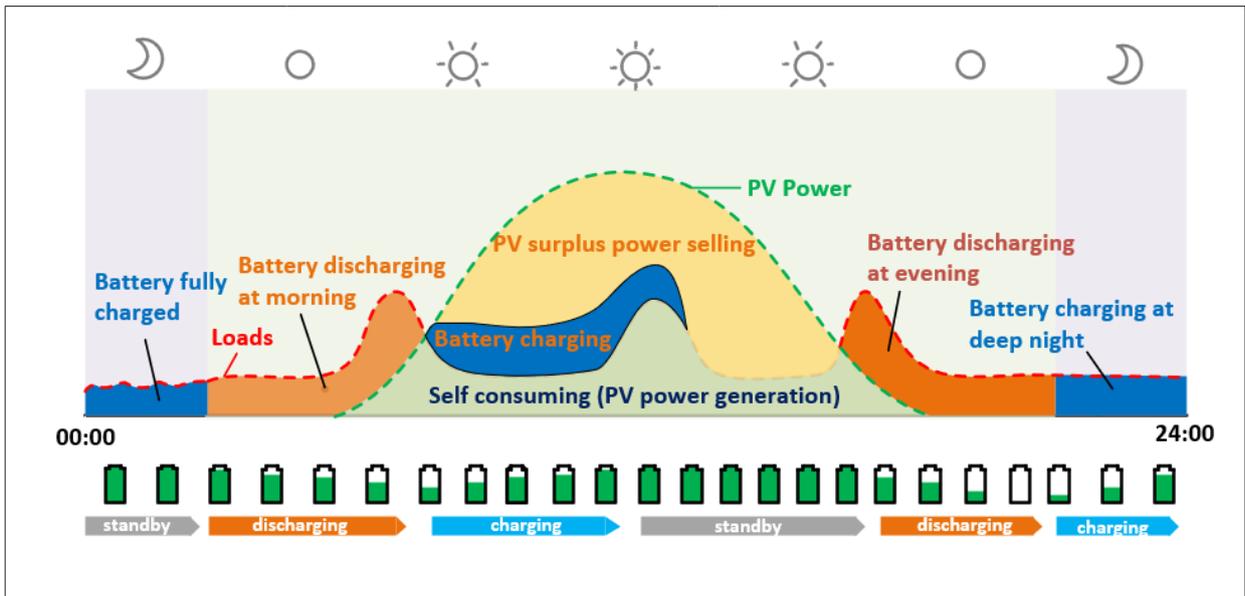
LED Indicators



Indicator	Status	Explanation
SOC		Full circle LEDs on – SOC is 75-100% 3/4 circle LEDs on – SOC is 50-75% 2/4 circle LEDs on – SOC is 25-50% 1/4 circle LED on – SOC is 10-25% 1/4 circle circle LED blink – SOC is below 10% All circle LEDs off – No BMS communication.
RUN		Off – Inverter is shut down Blink 1 – Inverter is booting Blink 2 – Inverter is in bypass mode On – Inverter is turned on
PV		Off – PV voltage is low Blink 1 – PV power is low On – PV is generating power
AC		Off – Grid is disconnected and EPS is off 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 – BMS and meter communications are OK
FAULT		Off – No fault On - A fault happens Blink 1 – EPS port overload Blink 2 – ISO/RCD fault Blink 3 – Arc fault

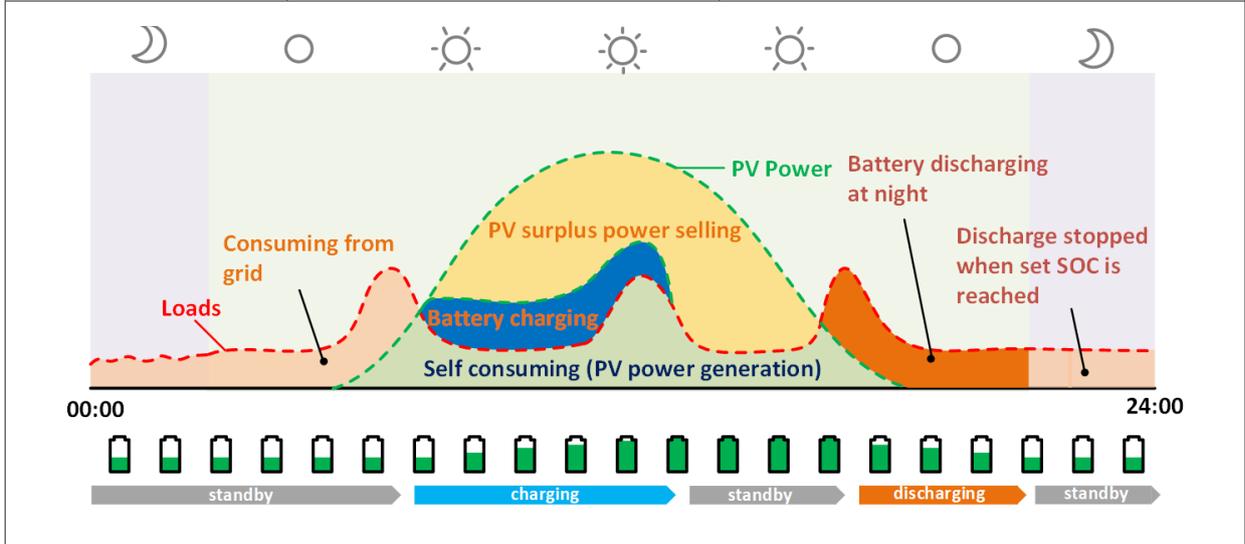
2.2 Operating Modes

Main Operation Modes		
<p>Self-consumption Mode</p>	<p>In the daytime, solar energy supports the loads first and surplus energy is stored in the battery. When it is fully charged or reaches the maximum charge power, the rest energy is fed into grid (or limited if required). At night, the battery discharge 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.</p>	
		
Power flow of self-consumption mode		
<p>Economic Mode</p>	<p>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.</p>	



Power flow of back-up mode

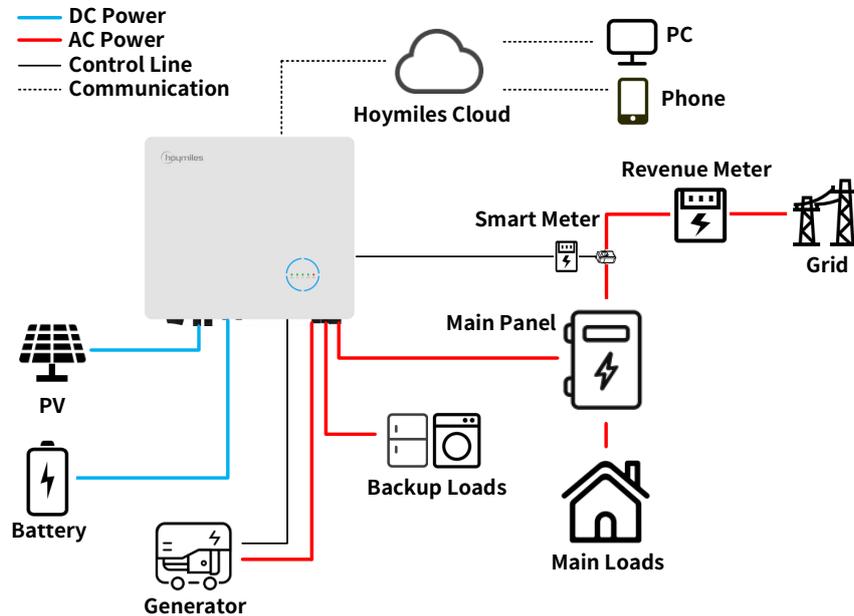
<p>Back-up Mode</p>	<p>In case of frequent power outages, a backup power SOC can be configured, which ensures that the battery always has enough energy to handle critical loads.</p>	
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Power flow of back-up mode

2.3 System Diagram

The HYS-LV Series hybrid 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) as well as for self-consumption of solar energy. It can either form a DC coupled system for a new installation or an AC coupled system to retrofit existing installations.



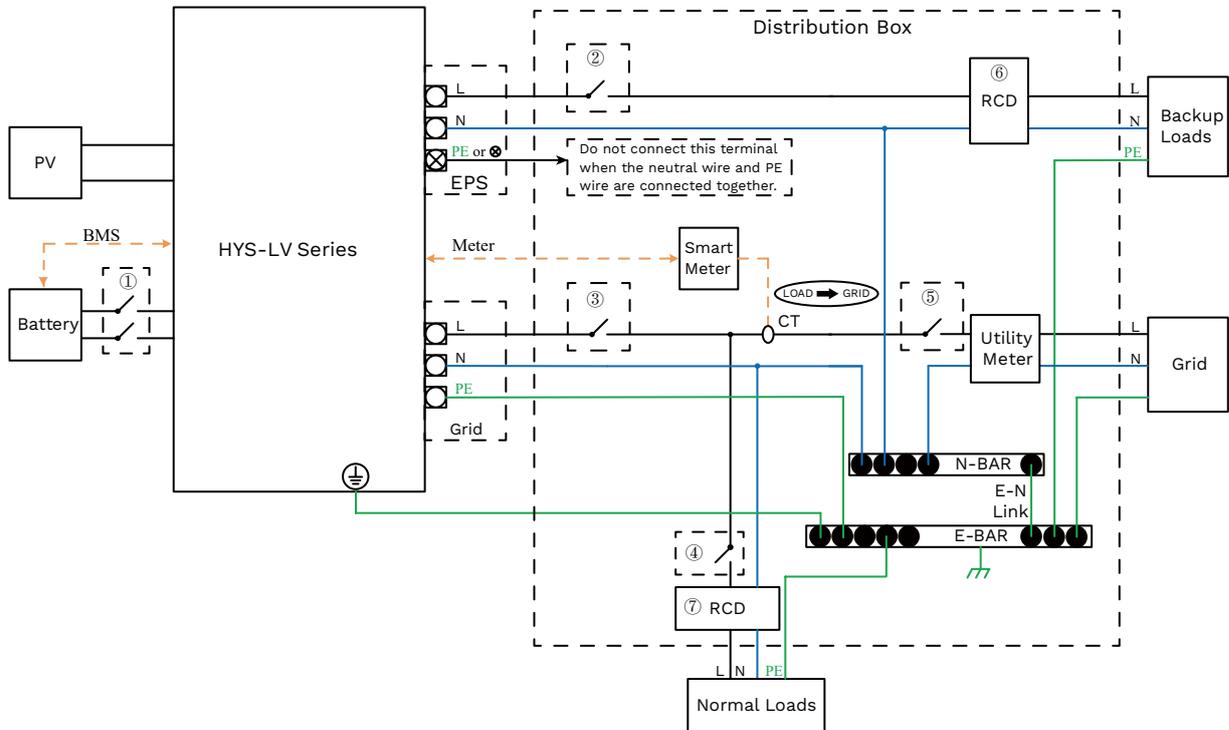
NOTICE

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

2.3.1 Basic Diagram

A. Diagram for Australia and New Zealand

 NOTICE	<ul style="list-style-type: none"> This diagram is an example of application that Neutral connects with PE in distribution box. For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regulations!
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Model	①	②	③	④	⑤	⑥⑦
HYS-3.0LV-EUG1	100A/60V DC Breaker	20A/230V AC Breaker	40A/230V AC Breaker	Depends on Loads	Main Breaker	30 mA RCD
HYS-3.6LV-EUG1	125A/60V DC Breaker	20A/230V AC Breaker	40A/230V AC Breaker			
HYS-4.6LV-EUG1	125A/60V DC Breaker	25A/230V AC Breaker	40A/230V AC Breaker			
HYS-5.0LV-EUG1	125A/60V DC Breaker	32A/230V AC Breaker	40A/230V AC Breaker			
HYS-6.0LV-EUG1	125A/60V DC Breaker	40A/230V AC Breaker	40A/230V AC Breaker			

Note:

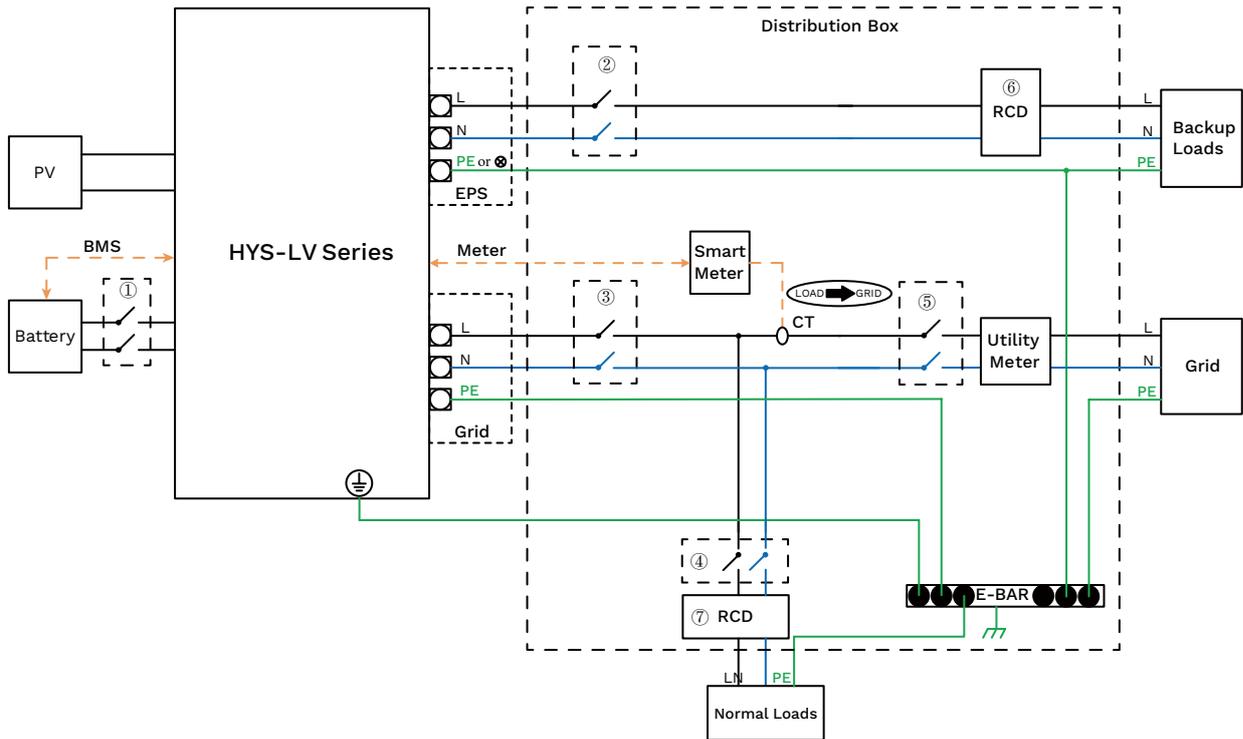
- If battery integrates a readily accessible internal DC breaker, no additional ① DC breaker is required.
- ⑥⑦ 30mA RCD is recommended not mandatory, please comply with local regulation, please comply with local regulation.

B. Diagram for Other Countries



NOTICE

- This diagram is an example for an application in which 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 back-up function may be abnormal when the grid fails.



Model	①	②	③	④	⑤	⑥⑦
HYS-3.0LV-EUG1	100A/60V DC Breaker	20A/230V AC Breaker	40A/230V AC Breaker	Depends on Loads	Main Breaker	30mA RCD
HYS-3.6LV-EUG1	125A/60V DC Breaker	20A/230V AC Breaker	40A/230V AC Breaker			
HYS-4.6LV-EUG1	125A/60V DC Breaker	25A/230V AC Breaker	40A/230V AC Breaker			
HYS-5.0LV-EUG1	125A/60V DC Breaker	32A/230V AC Breaker	40A/230V AC Breaker			
HYS-5.0LV-EUG1	125A/60V DC Breaker	40A/230V AC Breaker	40A/230V AC Breaker			

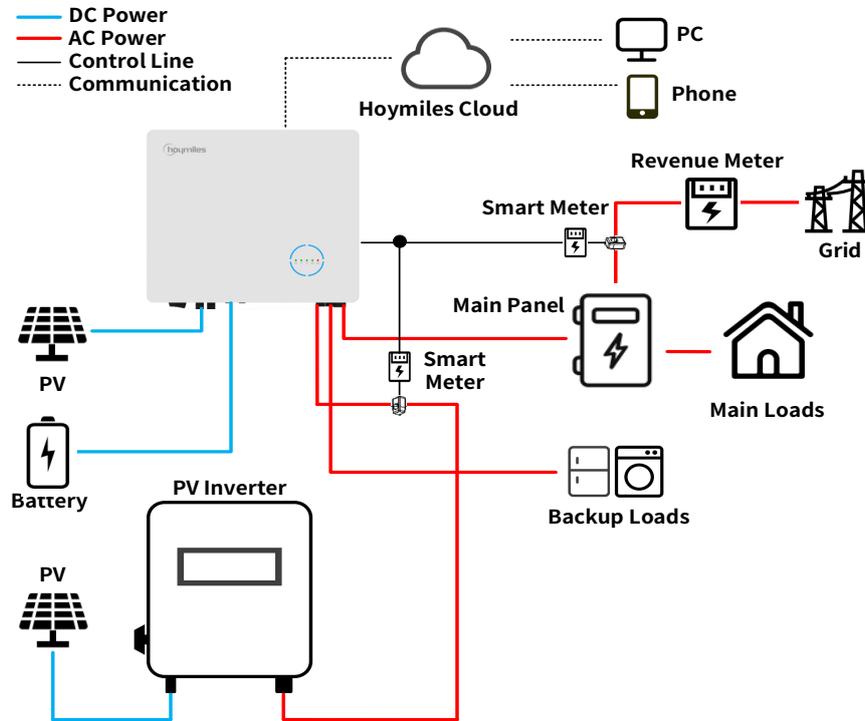
Note:

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

2.3.2 Retrofit System

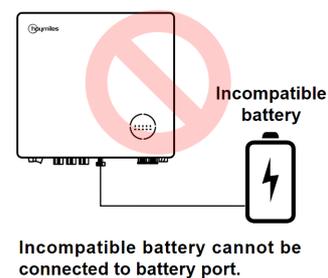
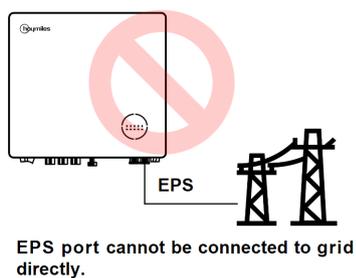
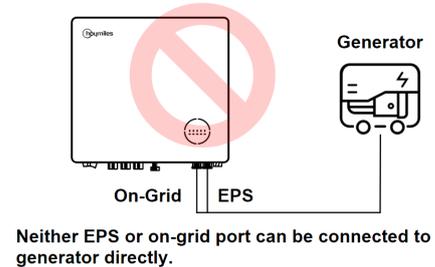
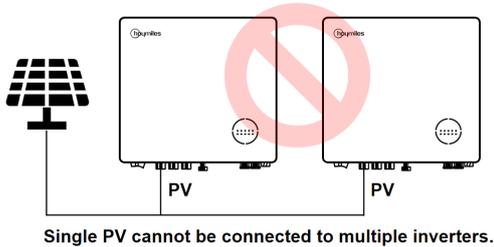
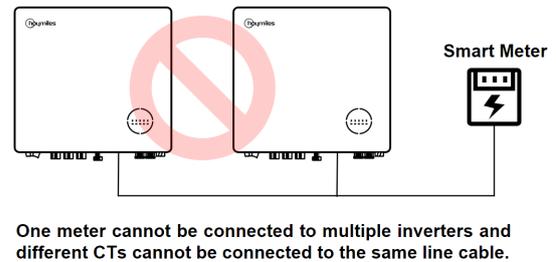
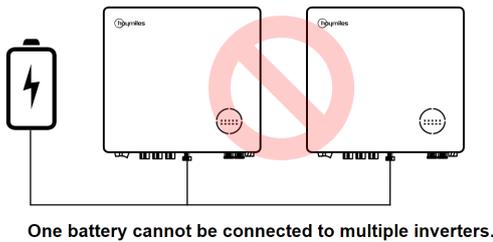
The HYS-LV series inverter is compatible with any single-phase PV grid-connected inverters. With the addition of the hybrid inverter, existing PV system can be retrofitted to be a PV ESS allowing more self-consumption energy and more back-up energy.

Consult with your system integrator for detailed wirings depending on your requirements.



2.3.3 Unacceptable Diagram

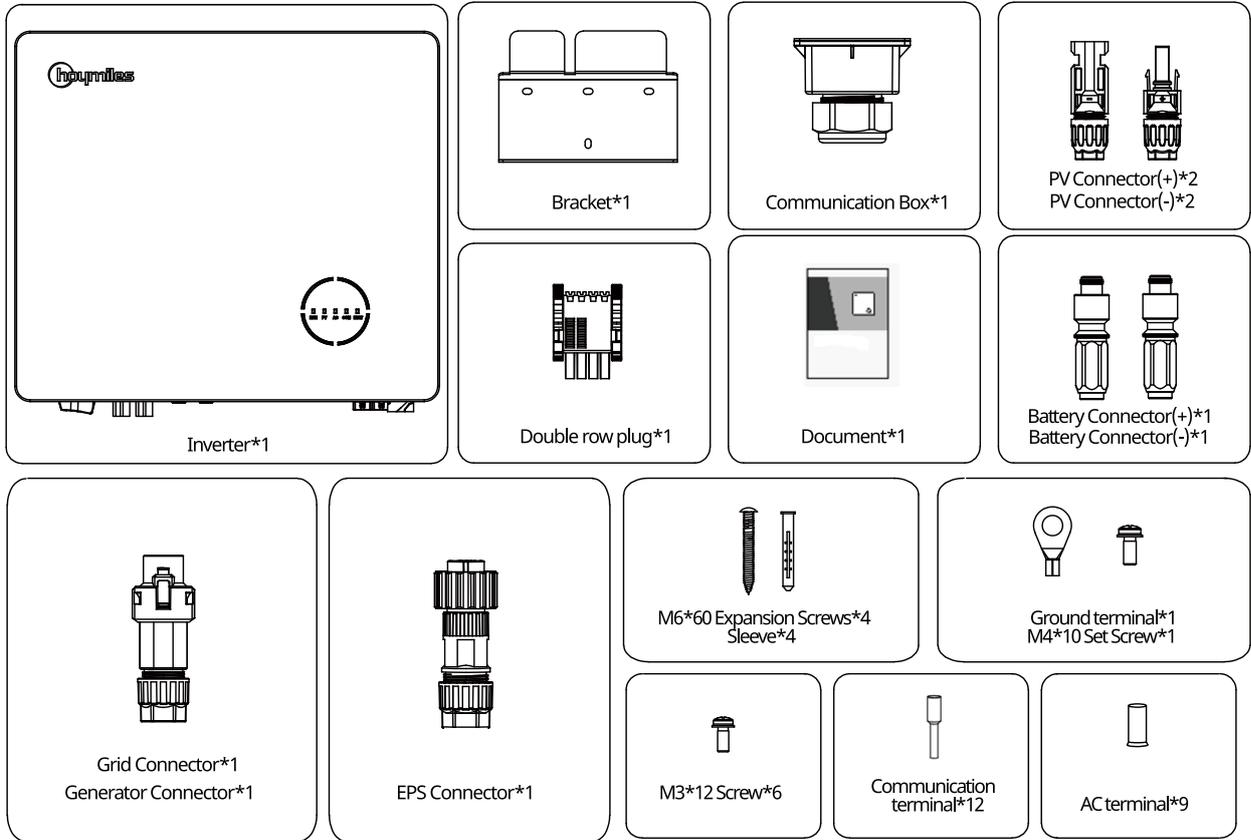
Avoid the following installation types to prevent damage to the system or the inverter.



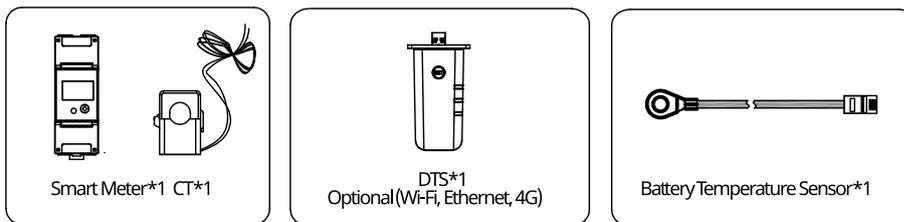
3. Installation Instruction

3.1 Packing List

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



Accessories packing list



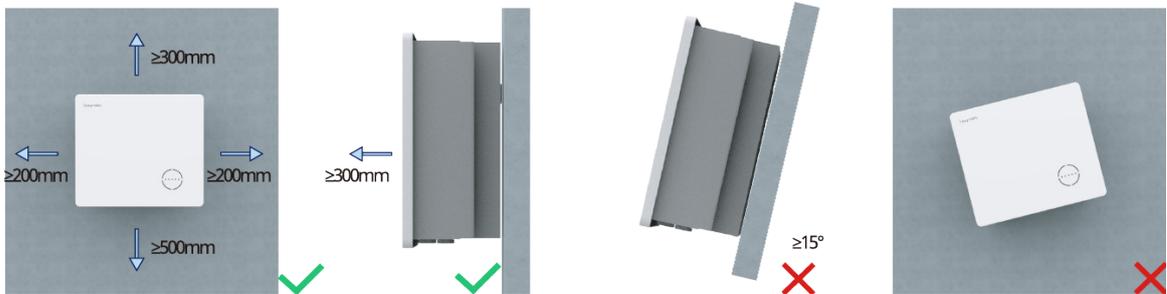
3.2 Mounting

3.2.1 Selecting the Mounting Location

 WARNING	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Make sure the inverter is correctly installed according to the following list. Any incorrect installation would require a risk assessment.

Check List

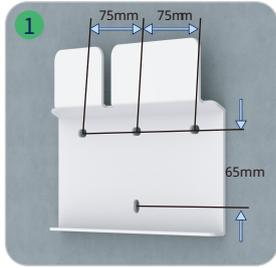
1. The inverter installation should be protected by shelter from direct sunlight or bad weather such as snow, rain or lightning.
2. The inverter should be installed on a solid surface which is suitable for the inverter's dimensions and weight.
3. The inverter should be installed vertically or be on a slope with a maximum value of 15°. Leave enough space around the inverter according to the figure below.



4. The ambient temperature should be between -25°C and 45°C. High ambient temperatures will cause power derating of the inverter.
5. The relative humidity should be less than 95%, without condensing.
6. The inverter should be installed at eye level for convenient maintenance.
7. The product label on the inverter should be clearly visible after installation.
8. The inverter should be installed far from flammable materials.

3.2.2 Mounting Inverter

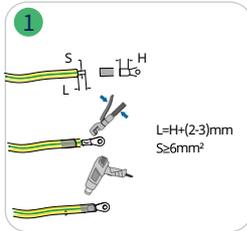
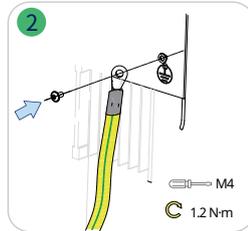
Install the inverter on the wall using the provided wall-mounting bracket and expansion plug sets.

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

3.3 Electrical Wiring Connection

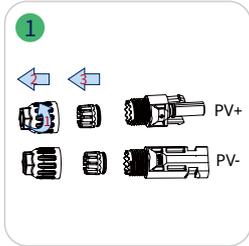
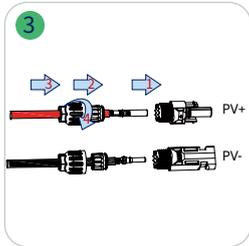
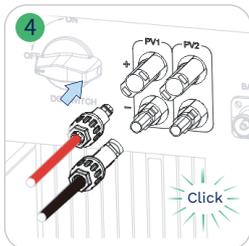
3.3.1 Grounding Connection

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 bottom right of the inverter, connect 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.		

3.3.2 PV Wiring Connection

 WARNING	<p>Before connecting, please make sure all requirements listed below are followed.</p> <ul style="list-style-type: none"> 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 Data in Chapter 5 for voltage and current limits. Since the inverter is a transformerless structure, please do not ground either output of the 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	<ul style="list-style-type: none"> 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		
<p>Step 1</p> <ul style="list-style-type: none"> Unscrew the PV connector counterclockwise. Remove the insulator. Remove the inner cable gland. 		
<p>Step 2</p> <ul style="list-style-type: none"> Strip the insulation from each DC cable by 7-8 mm. The conduct core-section: 2.5-4 mm². Assemble cable ends with crimp contacts by crimping pliers. 		
<p>Step 3</p> <ul style="list-style-type: none"> 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. 		
<p>Step 4</p> <ul style="list-style-type: none"> 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 550 V. Connect the PV connectors to the inverter. There should be a “click” sound, if it is plugged in correctly. 		

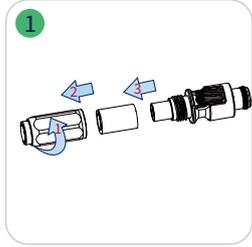
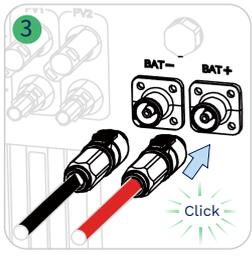
3.3.3 Battery Wiring Connection

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 as a grid-tied inverter, please contact Hoymiles for help.

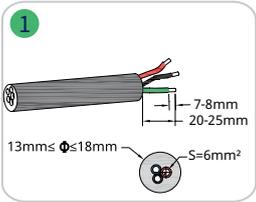
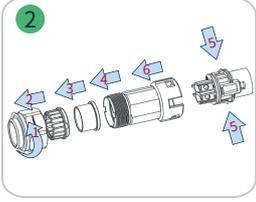
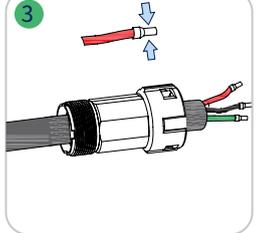
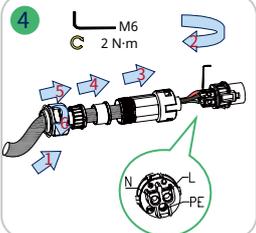
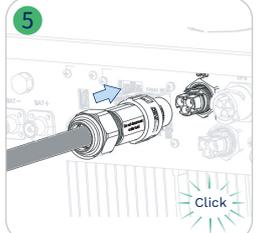
 <p>WARNING</p>	<ul style="list-style-type: none"> • A two-pole DC breaker with OCP function is compulsory to be installed between the inverter and battery. The battery may have this switch integrated. If not, an external DC switch of proper ratings should be used. • Make sure the breaker mentioned above is in the "off" position.
 <p>NOTICE</p>	<ul style="list-style-type: none"> • Use the battery connectors in the accessory box for battery connections.

Procedure		
<p>Step 1</p>	<ul style="list-style-type: none"> • Unscrew the battery connector counterclockwise. • Remove the insulator. • Remove the inner cable gland. 	
<p>Step 2</p>	<ul style="list-style-type: none"> • Strip the insulation from each DC cable by 7-8mm. • The conduct core-section: 20-25 mm². • Assemble cable ends with crimp contacts by crimping pliers. 	
<p>Step 3</p>	<ul style="list-style-type: none"> • 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 60 V. • Connect the battery connectors to the inverter. There should be a "click" if it is plugged in correctly. 	

3.3.4 AC Wiring Connection

3.3.4.1 Grid Connection

 <p>WARNING</p>	<p>Before connecting, please make sure all requirements listed below are followed.</p> <ul style="list-style-type: none"> • Use the Grid Connector from the accessory box. Damage to the device due to the use of 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.
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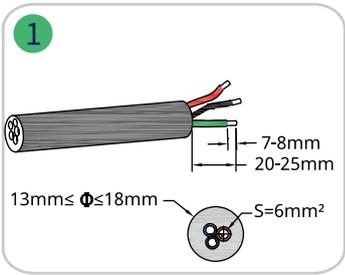
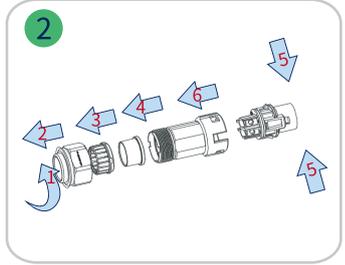
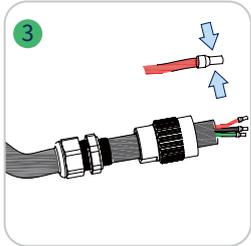
Procedure		
<p>Step 1</p>	<ul style="list-style-type: none"> • Thread the AC cable of appropriate length through the waterproof terminal. • Remove the cable jacket by 20~25 mm, and strip the wire insulation by 7-8 mm. • The conduct core-section: 6 mm². 	
<p>Step 2</p>	<ul style="list-style-type: none"> • Unscrew the Grid connector counterclockwise. • Disassemble the parts in sequence. 	
<p>Step 3</p>	<ul style="list-style-type: none"> • Press the connectors tightly on the cable conductor core. Make sure the cable jacket is not locked within the connector. 	
<p>Step 4</p>	<ul style="list-style-type: none"> • Fix all cables to the corresponding terminals with a torque of 2 N•m, according to markings on the connector with a screwdriver. Make sure the L/N/PE are correctly assembled. • Assemble the parts in sequence. 	
<p>Step 5</p>	<ul style="list-style-type: none"> • Tighten the waterproof terminal clockwise • Connect the grid connector to the inverter. There should be a “click” sound, if it is plugged in correctly. 	

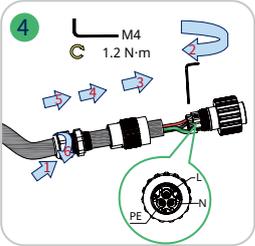
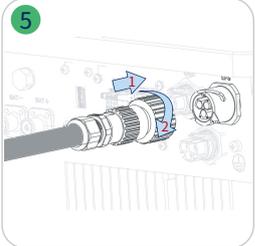
 <p>NOTICE</p>	<ul style="list-style-type: none"> If you need to connect Diesel Generator Connector, the method is the same as above.
---	---

3.3.4.2 EPS Connection

HYS-LV series has On-grid and Off-grid function, the inverter will deliver output power through the GRID port when the grid is on, and it will deliver output 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 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.

 <p>WARNING</p>	<ul style="list-style-type: none"> Before connecting, 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. Make sure the EPS load power rating is within the EPS output rating, otherwise the inverter will shut down with an “overload” warning. For the nonlinear load, please make sure the inrush power should be within the EPS output power range.
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Procedure		
<p>Step 1</p>	<ul style="list-style-type: none"> Thread the AC cable of appropriate length through the waterproof terminal. Remove the cable jacket by 20~25 mm, and strip the wire insulation by 7-8 mm. The conduct core-section: 6 mm². 	
<p>Step 2</p>	<ul style="list-style-type: none"> Unscrew the GEN connector counterclockwise. Disassemble the parts in sequence. 	
<p>Step 3</p>	<ul style="list-style-type: none"> Press the connectors tightly on the cable conductor core. Make sure the cable jacket is not locked within the connector. 	

<p>Step 4</p>	<ul style="list-style-type: none"> Fix all cables to the corresponding terminals with a torque of 1.2 N•m, according to markings on the connector with a screwdriver. Make sure the L/N/PE are correctly assembled. Assemble the parts in sequence. 	
<p>Step 5</p>	<ul style="list-style-type: none"> Tighten the waterproof terminal clockwise. Connect the EPS connectors to the inverter, and tighten it firmly. 	

3.3.5 Communication Wiring Connection

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



DI		DRM			
2	4	6	8		
IN-	D2/6	D4/8	REF		
1	3	5	7		
IN+	D1/5	D3/7	COM		

8-485A_2	7-485B_2	6-485A_1	5-485B_1	4-CANL	3-CANH	2-DI IN-	1-DI IN+
Para1							

120 Ohm	
ON	OFF

DO1	
1	2
NO1	COM1

8-NC	7-NC	6-NC	5-485B	4-485A	3-NC	2-NC	1-NC
Meter							

8-485B	7-485A	6-NC	5-CANL	4-CANH	3-NTC-	2-NTC+	1-NTC+
BMS							

8-485A_2	7-485B_2	6-485A_1	5-485B_1	4-CANL	3-CANH	2-DI IN-	1-DI IN+
Para2							

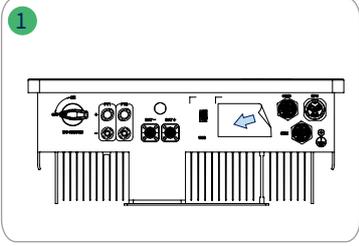
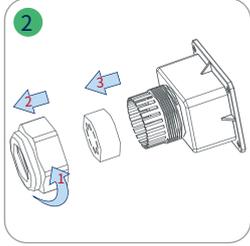
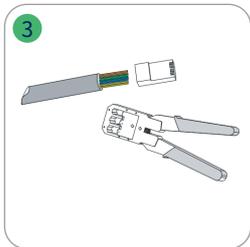
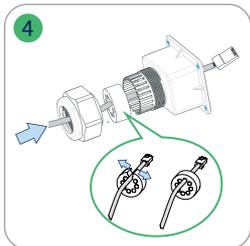
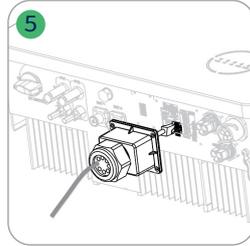
DO2	
1	2
NO2	COM2

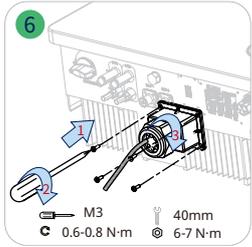
Label	Description
Meter (485A, 485B)	For the Smart Meter.
BMS (NTC+, NTC-, CANH, CANL, 485A, 485B)	For Li-ion battery communication via CAN or RS485. For lead-acid battery temperature is monitored via sensor through NTC+ and NTC-.
DRM (D1/5, D2/6, D3/7, D4/8, REF, COM)	For external Demand Response Enabling Device.
DI (IN-, IN+)	Dry-contact input of external bypass contactor.
Parallel (DI IN+, DI IN-, CANH, CANL, 485A_1, 485B_1, 485A_2, 485B_2)	For parallel operation.
120 Ohm (ON, OFF)	120 Ohm termination resistor for parallel operation.
DO1 (NO1, COM1)	Dry-contact output. The DO1 will control the bypass contactor under certain logic.
DO2 (NO2, COM2)	Dry-contact output. The DO2 can be set to one of the functions as follows: Earth Fault Alarm, Load Control, Backup Load Smart Control, and Generator Control.

3.3.5.1 BMS Connection

BMS is used to communicate with the compatible Li-ion battery. If lead-acid battery is selected to work with this inverter, battery sensor in packing list shall be used to monitor the battery temperature.

 <p>NOTICE</p>	<ul style="list-style-type: none"> • Connection of communication box is mandatory, no matter wirings or not.
---	---

Procedure		
Step 1	<ul style="list-style-type: none"> • Peel the stickers off from the communication port. 	
Step 2	<ul style="list-style-type: none"> • Unscrew the communication box counterclockwise. • Disassemble the parts in sequence. 	
Step 3	<ul style="list-style-type: none"> • 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 crimper. • The BMS or battery sensor pin definition is shown in chapter 3.3.5. 	
Step 4	<ul style="list-style-type: none"> • Thread the cable of an appropriate length through the communication box. • Clip the ethernet cable into the rubber ring. 	
Step 5	<ul style="list-style-type: none"> • Insert the RJ45 plug into the front plug connector until it clicks. • Tighten the cable gland. 	

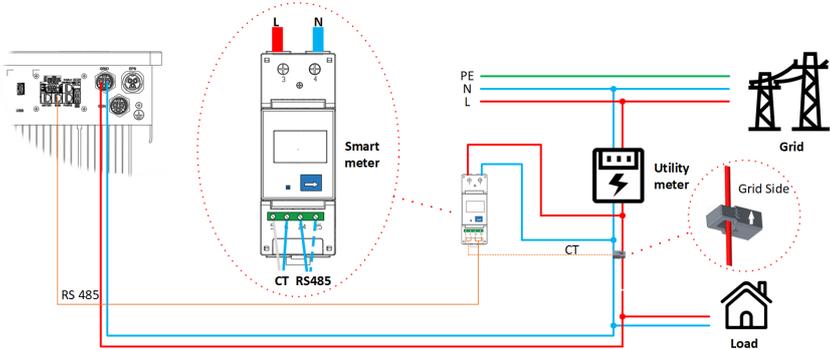
<p>Step 6</p>	<ul style="list-style-type: none"> • Install communication box with screws. • Connect the other end of the BMS cable to the battery, following the battery’s manual instructions. 	
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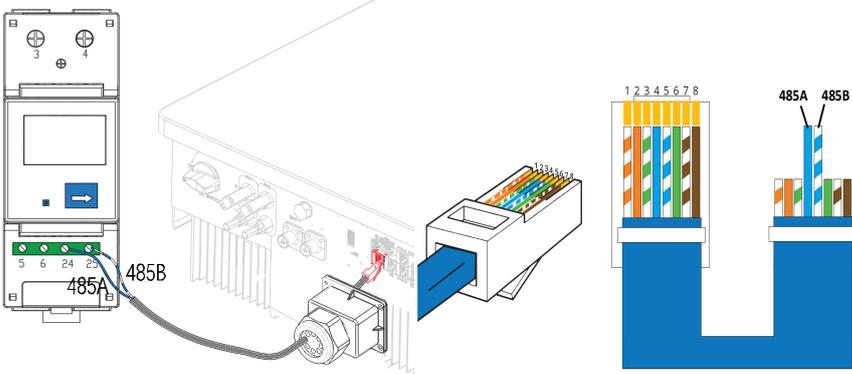
3.3.5.2 Smart Meter and CT Connection

A Smart Meter with the CT in the accessory box is necessary for system installation, and is used to provide the operating condition of the inverter via RS485 communications.

 <p>WARNING</p>	<ul style="list-style-type: none"> • Before connecting the Smart Meter and CT, ensure that the AC cable is totally isolated from the AC power source.
 <p>NOTICE</p>	<ul style="list-style-type: none"> • One smart meter can be used with only one HYS-LV inverter. • One CT 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 cell 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.

Procedure

<p>Step 1</p>	<ul style="list-style-type: none"> • Connect grid L/N to meter’s terminals 3/4. • Clamp CT to L line and connect wirings to 5/6 respectively. 
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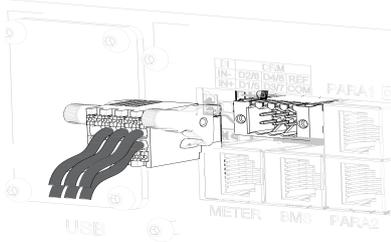
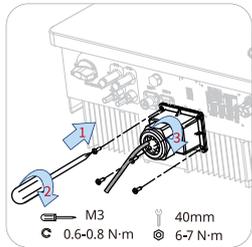
<p>Step 2</p>	<ul style="list-style-type: none"> • Connect the communication cable between the inverter and smart meter. 
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3.3.5.3 DRM Connection

DRM is designed to support several demand response modes by certain control signals, which are used for Australia and New Zealand.

Detailed connection of DRM is shown below.

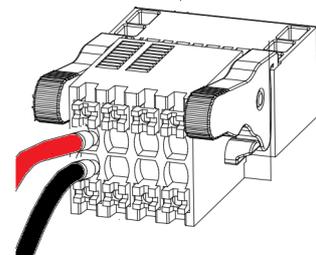
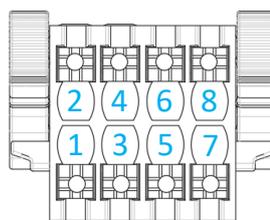
Procedure		
Step 1	<ul style="list-style-type: none"> Peel the stickers off from the communication port. 	
Step 2	<ul style="list-style-type: none"> Unscrew the communication box counterclockwise. Disassemble the parts in sequence. 	
Step 3	<ul style="list-style-type: none"> Strip the insulation layer of the communication cable, and lead the corresponding signal cables out. Press the terminal. 	<p>A:35-45mm B:7-8mm C:0.5-1mm²</p>
Step 4	<ul style="list-style-type: none"> Thread the cable of appropriate length through the communication box. Clip the cable into the Rubber ring. 	
Step 5	<ul style="list-style-type: none"> Plug the wires into the terminal block firmly according following tables. 	

<p>Step 5</p>	<ul style="list-style-type: none"> For DRED, wiring from the No.3 to No.8 holes. The function of each connection position is shown below. <table border="1" data-bbox="395 324 882 439"> <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>	NO.	4	6	8	Function	DRM2/6	DRM4/8	REFGEN	NO.	3	5	7	Function	DRM1/5	DRM3/7	COM/DRM0	<ul style="list-style-type: none"> For Remote Shutdown, wiring the No.7 and No.8 holes. The function of each connection position is shown below. <table border="1" data-bbox="1050 309 1348 450"> <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>	NO.	8	Function	REFGEN	NO.	7	Function	COM/DRM0
NO.	4	6	8																							
Function	DRM2/6	DRM4/8	REFGEN																							
NO.	3	5	7																							
Function	DRM1/5	DRM3/7	COM/DRM0																							
NO.	8																									
Function	REFGEN																									
NO.	7																									
Function	COM/DRM0																									
<p>Step 6</p>	<ul style="list-style-type: none"> Pull the wires outward to check whether they are firmly installed. Insert the terminal block into the connector until it snaps into place with an audible click. 																									
<p>Step 7</p>	<ul style="list-style-type: none"> Tighten the cable gland. 																									

3.3.5.4 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 Chapter 3.3.5.3. Wiring the No.1 and No.2 holes if used, and the function of each connection position is shown below.

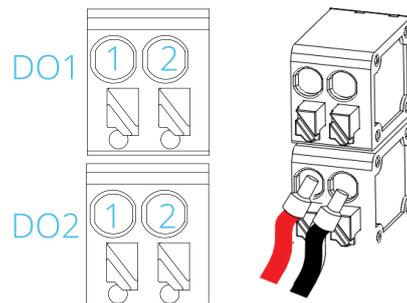
NO.	2
Function	IN-
NO.	1
Function	IN+

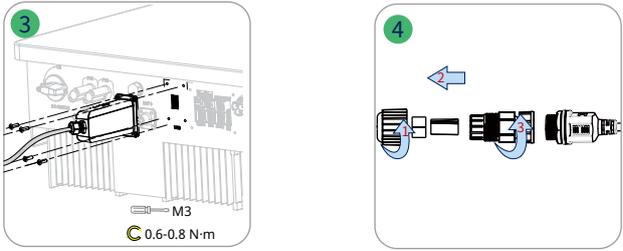
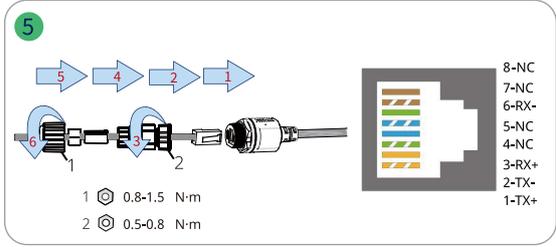


3.3.5.5 DO Connection

The inverter has integrated a multiple-function dry-contact (DO1 and DO2). The DO1 can control the external bypass contactor if installed. The DO2 can be set to one of the functions as follows, Earth Fault Alarm, Load Control, and Generator Control. The connection method is the same as DRM(chapter 3.3.5.3), The connection position is shown in the figure below.

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



<p>Step 3&4</p>	<ul style="list-style-type: none"> • Insert the DTS-Ethernet to the USB port, and fasten the screws tightly. • Unscrew the swivel nut from the connector. 	
<p>Step 5</p>	<ul style="list-style-type: none"> • Insert the RJ45 (pin definition is shown in the right figure) plug into the connector until there is an audible click sound. • Thread the cable of an appropriate length through the connector. • Tighten the cable gland. 	

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 Cloud.
	OFF	Improper communication with Cloud.
	BLINK	Improper communication with Cloud, but the network is connected.

3.4 Operation

3.4.1 S-Miles Cloud Application

The S-Miles Cloud application has been developed for Hoymiles' hybrid 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. A QR code can also be scanned on the back of this User Manual to download the App. Please refer to the DTS user manual from www.hoymiles.com/resources/download/ for details.

3.4.2 Commissioning

 WARNING	<p>Before commissioning the inverter, make sure:</p> <ul style="list-style-type: none"> • The inverter DC switch and external circuit breaker are disconnected; • Check wiring according to “3.3 Electrical Wiring Connection”; • 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.
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Procedure	
Step 1	Wire the o inverter to the AC circuit breakers.
Step 2	Rotate the DC switch to “ON”.
Step 3	Connect the DC circuit breaker between the battery and the inverter, and power on the battery pack if it’s required.
Step 4	Establish a communication connection between the mobile phone and DTS. Configure the parameters in Storage Toolkit and Network Config referring to “3.4.2 S-Miles Cloud APP”. Then use the System Self-test function to detect if there is a problem with the system.
Step 5	Operate the inverter and the system will work properly.

3.4.3 Decommissioning

 NOTICE	<ul style="list-style-type: none"> • Please strictly follow the following procedure. Otherwise it will cause lethal voltages or unrecoverable damage to the inverter.
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Procedure	
Step 1	Stop the inverter from working via Hoymiles APP.
Step 2	Rotate the DC switch to the “OFF” position.
Step 3	Turn off the DC circuit breaker between the inverter and the battery.
Step 4	Turn off the AC circuit breakers of GRID, EPS and GEN.
Step 5	Wait at least 10 minutes after the LED indicators turn off to release the internal energy.
Step 6	Disconnect all the power cables. Disconnect all the communication cables. Remove DTS and power meter.
Step 7	Remove the inverter from the wall, and remove the bracket if necessary. Pack the inverter and accessories.

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 safety country 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 Undervoltage	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 safety country 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, please 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 safety country 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, please 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 reliably. 2. Check whether the AC cable is firmly in place. 3. Check whether the AC cable is correctly connected. 4. Check whether the AC circuit breaker is disconnected. 5. If the alarm persists, contact Hoymiles technical support team.
Residual Current Fault	The residual leakage current is too high.	1. The alarm can be caused by high ambient humidity, and the inverter will reconnect to the grid after the environment is improved. 2. If the environment is normal, check whether the AC and DC cables are well insulated. 3. If the alarm persists, contact Hoymiles technical support team.
PV Reverse Connection	The inverter detects that the PV strings are reversely connected.	1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the string current drops below 0.5A. 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.
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.	<ol style="list-style-type: none"> 1. Make sure that the installation complies with the instructions from User Manual. 2. Check whether the alarm "Fan Fault" occurs. If so, replace the faulty fan. 3. If the alarm persists, contact Hoymiles technical support team.
Isolation Fault	The ground insulation impedance of the PV string is too low.	<ol style="list-style-type: none"> 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 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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 reverse connected.	<ol style="list-style-type: none"> 1. Make sure that the installation complies with the instructions from User Manual. 2. If the alarm persists, please contact Hoymiles technical support team.
Meter Communication Fault	The inverter detects that there is a meter communication fault.	<ol style="list-style-type: none"> 1. Check whether the Meter communication cable and terminal are abnormal. 2. Reconnect the Meter communication cable. 3. If the alarm persists, please contact Hoymiles technical support team.
Battery Reverse Connection	The inverter detects that the battery wirings are reversely connected.	<ol style="list-style-type: none"> 1. Check the battery for polarity correctness, and correct it if necessary. 2. If the alarm persists, please contact Hoymiles technical support team.
Battery Voltage Fault	The battery voltage is higher than the permissible range.	<ol style="list-style-type: none"> 1. Check if the battery input voltage is within the normal range. 2. If the alarm persists, please contact Hoymiles technical support team.
BMS Communication Fault	The inverter detects that there is a BMS communication fault.	<ol style="list-style-type: none"> 1. Check whether the BMS communication cable and terminal are abnormal. 2. Reconnect the BMS communication cable. 3. If the alarm persists, please 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 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

Model	HYS-3.0LV-EUG1	HYS-3.6LV-EUG1	HYS-4.6LV-EUG1	HYS-5.0LV-EUG1	HYS-6.0LV-EUG1
Battery					
Battery Type	Li-ion / Lead-acid				
Nominal Battery Voltage (V)	48				
Voltage Range (V)	40-60				
Max. Charge Current (A)	75	90	100	100	100
Max. Discharge Current (A)	75	90	100	100	100
Charging Strategy for Li-ion Battery	Self-adaption to BMS				
Charging Curve	3 Stages / Equalization				
External Temperature Sensor	Optional				
PV Input					
Max. PV Input Power (W)	4500	6000	7500	7500	7500
Max. PV Input Voltage (V)	550				
Nominal Input Voltage (V)	360				
MPPT Voltage Range (V)	125-500				
Start-up Voltage (V)	150				
Number of MPPTs	1	2	2	2	2
Max. Number of PV String per MPPT	1	1/1	1/1	1/1	1/1
Max. PV Input Current (A)	14	14/14	14/14	14/14	14/14
Short-circuit Current of PV Input (A)	17	17/17	17/17	17/17	17/17
AC Input and Output (On-grid)					
Nominal Output Apparent Power (VA)	3000	3680	4600	5000 ⁽¹⁾	6000 ⁽¹⁾
Max. Output Apparent Power (VA)	3000	3680	4600	5000 ⁽¹⁾	6000 ⁽¹⁾
Max. Input Apparent Power (VA)	6000	7360	7360	7360	7360
Nominal AC Voltage (V)	230				
Nominal Grid Frequency (Hz)	50/60				
Max. Output Current (A)	13.0	16.0	20.0	21.7	26.0 ⁽²⁾
Max. Input Current (A)	26.1	32.0	32.0	32.0	32.0
Power Factor	0.8 leading ... 0.8 lagging				
Total Harmonic Distortion (@nominal output)	<3%				
AC Output (Off-grid)					
Max. Output Apparent Power (VA)	3000	3680	4600	5000	6000
Peak Output Apparent Power (VA) ⁽³⁾	6000, 10s	7360, 10s	9200, 10s	10000, 10s	10000, 10s
Nominal AC Voltage (V)	230				
Nominal AC Frequency (Hz)	50/60				
Max. Output Current (A)	13.0	16.0	20.0	21.7	26.0
Total Harmonic Distortion (@ linear load)	<3%				

Model	HYS-3.0LV-EUG1	HYS-3.6LV-EUG1	HYS-4.6LV-EUG1	HYS-5.0LV-EUG1	HYS-6.0LV-EUG1
Efficiency					
Max. Efficiency	97.6%	97.6%	97.6%	97.6%	97.6%
Euro Efficiency	97.0%	97.0%	97.0%	97.0%	97.0%
Max. Battery to Load Efficiency	95.0%	95.0%	95.0%	95.0%	95.0%
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%	99.9%
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					
Dimension (W × H × D) [mm]	502 × 461 × 202				
Weight (kg)	25				
Mounting	Wall Mounting				
Operation Temperature (°C)	-25 to + 65 (>45, derating)				
Relative Humidity	0-95%, no condensing				
Altitude (m)	≤2000				
Cooling	Natural Convection				
Protection Degree	IP65				
Noise (dB [A])	<40				
User Interface	LED & App				
Communication with BMS	RS485, CAN				
Communication with Meter	RS485				
Communication Interface	RS485, Wi-Fi/Ethernet/4G (optional)				
Digital Input/Output	DRM, 1 × DI, 2 × DO				
Isolation Method (Solar / Battery)	Transformerless / High-frequency Isolation				
Certifications and Standards					
Grid Regulation	EN 50549, VDE-AR-N 4105, AS/NZS 4777.2				
Safety Regulation	IEC 62109-1, IEC 62109-2				
EMC	EN 61000-6-1, EN 61000-6-3				

(1) 4600 for VDE-AR-N 4105 & VDE0126-1-1; 4999 for AS/NZS 4777.2

(2) 21.7A for AS/NZS 4777.2

(3) Can be achieved only if PV and battery power are sufficient

6. Contact Information



S-Miles Installer



S-Miles Enduser

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