

Three Phase Hybrid Inverter User Manual

MH-HYIV15.0-TH-S4

MH-HYIV15.0-TH-S4-AU

MH-HYIV20.0-TH

MH-HYIV20.0-TH-AU

MH-HYIV25.0-TH

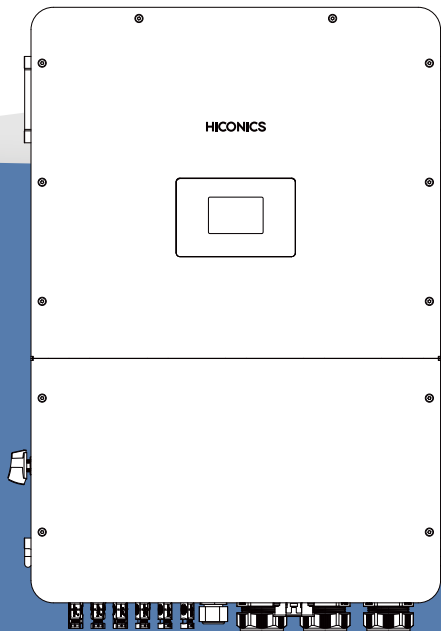
MH-HYIV25.0-TH-AU

MH-HYIV29.9-TH

MH-HYIV29.9-TH-AU

MH-HYIV30.0-TH

MH-HYIV30.0-TH-AU



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1 Preface

This document provides information on the installation, use, and maintenance of the inverter. Please read this document carefully before installing and using the inverter.

Note: Damage to the inverter or personal injury or property damage caused by failure to install, use, or maintain the inverter in accordance with this manual and the corresponding quick release manual is not covered by the equipment manufacturer's responsibility.
More product warranty information is available from the official website:
www.hiconics-global.com

1.1 Applicable Products

This manual only applies to the specified inverter, the inverter model and parameters are as follows:

Model	Rated Output Capacity	Rated Output Voltage
MH-HYIV15.0-TH-S4(-AU)	15000W	3L/N/PE, 220 V / 380 V, 230 V / 400 V
MH-HYIV20.0-TH(-AU)	20000W	
MH-HYIV25.0-TH(-AU)	25000W	
MH-HYIV29.9-TH(-AU)	29900W	
MH-HYIV30.0-TH(-AU)	30000W	

1.2 Applicable People

This manual applies to :

- Installer
- End-User

Note: It is strictly prohibited to operate or maintain the inverter without professional training or relevant electrical knowledge.

1.3 Definition of symbols

Symbols represent different hazard levels, please read this manual carefully before using the product to ensure the safe use of the inverter

	Danger!	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
--	----------------	---

	Warning!	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
--	-----------------	--

	Caution	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
--	----------------	--

	Notice	Indicates actions of which, if not avoided, could result in material damage.
--	---------------	--

1.4 EU Declarations of Conformity

HICONICS ECO-ENERGY DRIVE TECHNOLOGY CO., LTD. hereby declares that the inverter described in this document complies with the basic requirements and other relevant conditions of the directives listed below.

Directive 2014/30/EU

(On the harmonisation of the laws of the Member States relating to electromagnetic compatibility (EMC))

Directive 2014/35/EU

(On the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits – in short: Low Voltage Directive)

Directive 2011/65/EU (RoHS)

(on the restriction of the use of certain hazardous substances in electrical and electronic equipment)

You will find a detailed EU Declaration of Conformity in the download area at:
www.hiconics-global.com

2 Safety Precautions

Safety precautions are matters that must be observed or paid attention to when using a product. Although the inverter is designed and tested in strict accordance with the relevant safety regulations, as an electrical device, improper operation may still result in serious personal injury or property damage. Therefore, be sure to read this manual carefully before using the inverter to avoid unnecessary injury or damage.

This section divides the precautions into general safety, PV DC input side, AC output side, inverter and personnel requirements.

2.1 General Safety Requirements



Notice

- This document may be updated from time to time as products are updated. The company will try to ensure the accuracy and timeliness of the document, but the contents and notes in this document are only for guidance and should not be relied upon. Please contact the relevant after-sales department when equipment failure occurs, do not disassemble or repair privately, so as not to cause unnecessary personal injury and property damage.
- Before installing the equipment, please read this document carefully to understand the performance and characteristics of the product. The installer must be a qualified electrical technician with professional training and knowledge of local codes.
- The inverter must wear appropriate protective equipment during installation and use. The installation location must have the appropriate load-bearing capacity. Handling must be in accordance with the handling requirements to avoid injuries. During the use of the inverter, you must use the appropriate insulating tools and wear personal protective equipment to avoid damage to the inverter or personal injury.
- The inverter should be installed out of the reach of small children.

2.2 PV DC Input



Danger!

The DC PV connector and PV terminal block included in the accessory package must be used to connect the inverter DC cable. The DC PV connector and PV terminal block included in the accessory package should be matched with the DC connector on the inverter side. If other manufacturers' PV connectors and PV terminal blocks are used, there may be a serious risk of malfunction, and we will not be responsible for any damages to persons or property caused by the use of the connectors and terminals that are not in accordance with the requirements.

**Warning!**

- The PV matrix will supply DC power to the PCE when exposed to light.
- Ensure that the metal frame of the PV module is electrically securely connected to the PV mounting bracket.
- The DC cable connections should be reliable and not loose.
- Use a multimeter to measure the DC string voltage to ensure that the positive and negative terminals are correct and that the measured voltage is within the range of the multimeter.
- The PV modules used to connected to this inverter shall be Class A or Class II rating certified according to IEC 61730.

2.3 AC Side Output

**Warning!**

- Before installation, make sure that the AC output voltage and frequency of the inverter matches the voltage and frequency of the grid.
- The AC output side of the inverter should be protected by circuit breakers or fuses, which should be larger than 1.25 times of the maximum output current of the AC side of the inverter.
- The grounding wire of the inverter shell must be connected reliably. When more than one inverter is installed, make sure that all the inverter shells are grounded reliably.
- The AC output cable of the inverter should be made of copper core cable with matching tubular terminals.

2.4 Hybrid Inverter

**Danger!**

- During the inverter installation, the electrical and communication interfaces should be avoided to be stressed, otherwise it will lead to unreliable electrical connection, terminal and connector damage.
- For inverter installation, note that the labels and signs on the box need to be clearly visible, and it is prohibited to modify, paint, cover or damage them privately.
- If the equipment is damaged due to disassembly or modification without permission, this loss is not borne by the manufacturer.
- Prohibit the appearance of single-phase and three-phase inverters mixed application scenarios.

The markings on the inverter housing are as follows:

Symbol	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE
	TUV SUD Mark
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation. Danger of high temperature.
	Danger to life due to high voltages in the inverter!
	Danger Risk of electric shock!
	Observe enclosed documentation
	The system can't be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate this equipment until it is isolated from battery, grid and on-site PV generator.
	Danger to life due to high voltage. There is residual voltage existing in the inverter after powering off, which needs 5 min to discharge. Wait 5 minutes before opening the cover.
	Australian certification mark.

Anti-Islanding Effect

- Islanding effect is a special phenomenon that grid-connected PV system still supply power to the nearby grid when the voltage loss is happened in the grid system. It is dangerous for maintenance personnel and the public. This series inverter provide Active Frequency Drift (AFD) to prevent islanding effect.

PE Connection and Leakage Current

- The end-use application shall monitor the protective conductor by residual current operated protective device (RCD) with rated fault current $I_{fn} \leq 300\text{mA}$ which automatically disconnects the device in case of a fault.



Warning!

Warning!

High leakage current!

Ground the system before power on.

-
- Incorrect grounding can cause physical injury, death or equipment malfunction and electromagnetic radiation increase.
 - Make sure that grounding conductor is adequately sized as required by safety regulations.
 - The residual current monitoring unit (RCMU) is integrated into the inverter to prevent the residual current from exceeding the limit.
 - The type A RCD can be connected to the inverter for protection according to the local laws and regulations if required. At the ongrid port, the RCD residual current rating should be 300 mA (recommended), or it can be set to other values according to local regulations. At the back-up port, the Maximum RCD residual current rating should be 30 mA, or it can be set to other values according to local regulations.

For United Kingdom

- The installation that connects the equipment to the supply terminals shall comply with the requirements of BS 7671.
- No protection settings can be altered.
- User shall ensure that equipment is so installed, designed and operated to maintain at all times compliance with the requirements of ESQCR22(1)(a).

For Australia and New Zealand

- Electrical installation and maintenance shall be conducted by licensed electrician and shall comply with Australia National Wiring Rules.

Battery Safety Instructions

(When paired with an external battery system, the installation requirements for the inverter shall comply with the following:)

- This series inverter can be operated with high voltage battery system, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to the parameters list.
- To prevent potential electric shock and short-circuit current hazards that may arise from accumulator batteries, it is advised to follow the following precautions while the battery replacement:
 1. Do not wear watches, rings or similar metallic items.
 2. Use insulated tools.
 3. Put on rubber shoes and gloves.
 4. Do not place metallic tools and similar metallic parts on the batteries.
 5. Switch off load connected to the batteries before dismantling battery connection terminals.
 6. Only personal with proper expertise can carry out the maintenance of accumulator batteries.

**Notice**

The system detects a thermal runaway (Venting of gaseous electrolyte; Burning of the cell, spark formation and ignition of vented gas mixtures; Explosion of the cell) , it wirelessly sends a thermal runaway signal to the user's alarm system to inform the user that a thermal runaway has occurred. Users need to configure buzzer alarm products at home. (The alarm light is red, and the alarm buzzer has a sound level greater than 85dB but less than 110dB, with a frequency below 3.5kHz.)

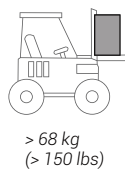
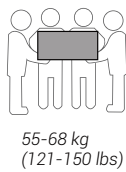
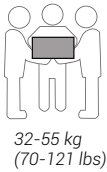
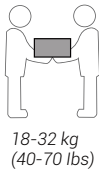
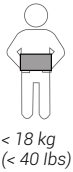
2.5 Operator Requirements



Notice

- Personnel responsible for installation, operation, operation and maintenance must have professional knowledge, be professionally trained, master the operation methods, and be familiar with the safety precautions and the norms and standards of the country and locality where they are located.
- Professionals with operating qualifications install, operate, maintain and dismantle relevant equipment and facilities.
- Special types of work, such as electrical installation, elevated work, and operation of professional equipment, require professional special operation qualifications in the countries and regions where they are located.
- Replacement of equipment, components, software must be operated by authorised professionals.
- Except for professional operators, other unrelated persons should not approach or operate the equipment.

- When carrying heavy objects, you should be prepared to bear the weight to avoid being crushed or sprained by heavy objects.



- When multiple people carry heavy objects at the same time, it is necessary to consider the height and other conditions, and do a reasonable job of personnel matching and division of labor to ensure a balanced weight distribution.
- When two or more people are carrying heavy loads together, one person should direct the equipment and lift or lower the equipment at the same time to ensure a uniform pace.
- When handling equipment by hand, you should wear protective gloves, labor protection shoes and other safety protective equipment to avoid injury.
- When carrying the equipment by hand, first approach the object, squat down, use the force of straightening your legs, do not use the strength of your back, slowly and steadily lift the object, and it is strictly forbidden to suddenly jerk or twist the torso.

- Do not quickly lift heavy objects to waist height, but place them on a half-waist high workbench or an appropriate place, adjust the position of your palms, and then lift them.
- Carrying heavy objects must be balanced and stable; The speed of movement should be uniform and low; Positioning is required to be smooth and slow, so as to avoid any impact or drop that scratches the surface of the equipment or damages the components and cables of the equipment.
- The left and right handles on the inverter are not intended for lifting or moving the inverter; instead, they are designed to provide stability (for the user to hold onto) or serve as an auxiliary support during operation/use.

2.6 Channel for Handling Security Issues

- After-sales service: Get assistance via phone, email, or online customer service;

EU: solar_service_eu@midea.com

AU&Newzealand: solar_service_au@midea.com

Overseas: solar_service@midea.com

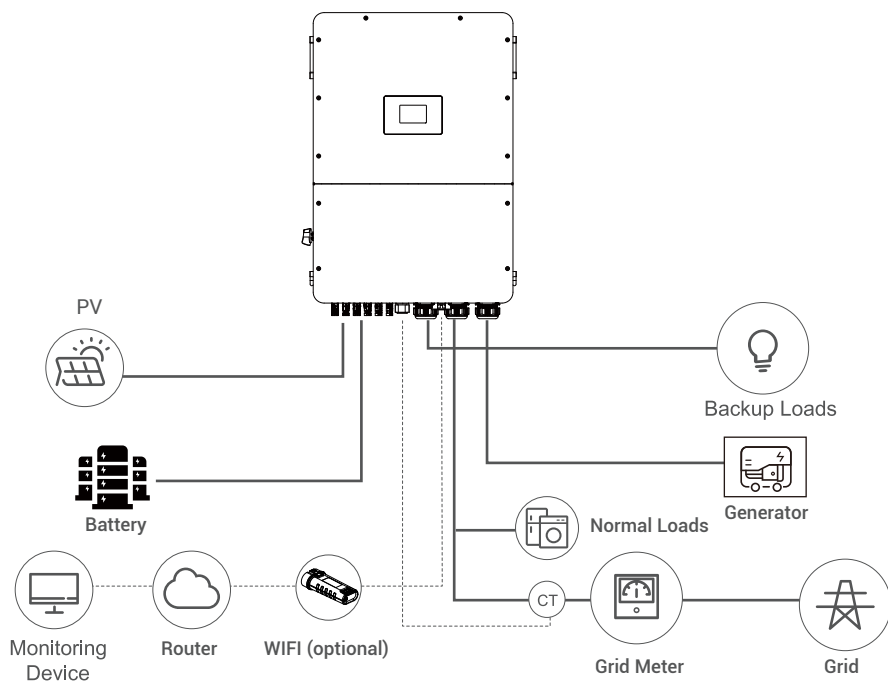
- Reporting channel: Report security issues through the after-sales service channel.
- Issue tracking: Track the progress of problem resolution through after-sales service channels

3 Products Introduction

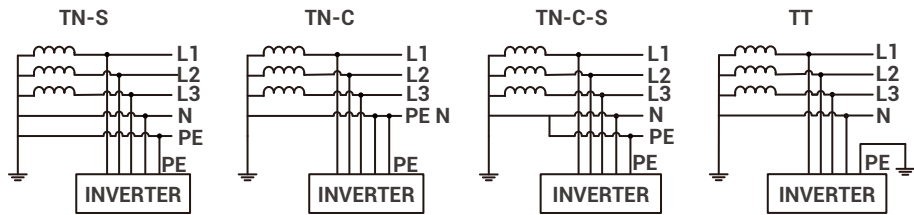
3.1 Basic Features

This series is a multifunctional inverter for high-voltage batteries, capable of intelligently switching the direction of energy flow according to the system status to meet the functions of battery storage, inverter with load, and grid-connected power sales.

System Diagram

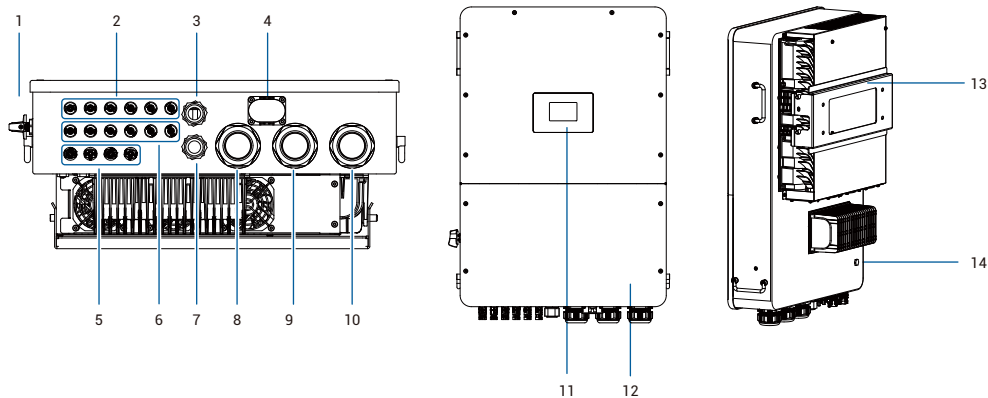


3.2 Supported Grid Forms



3.3 Appearance Description

3.3.1 Appearance Introduction



N0.	Parts	Clarification
1	DC Switch	DC Switch
2	PV+	PV Input Terminal
3	COM1	Communication Ports 1
4	WIFI (optional)	WIFI (optional)
5	BAT1/BAT2	Battery Input Terminals
6	PV-	PV Input Terminal
7	COM2	Communication Ports 2
8	BACKUP	BACKUP Load Port
9	GRID	Grid Connection Port
10	GEN	Generator Connection Port
11	LED	Display the operation status of Hybrid Inverter
12	Front Cover	Front Cover
13	Mounting Bracket	Mounting Bracket
14	Vent valve	Keep the internal and external air pressure consistent

3 7 M25 Gland Cap:

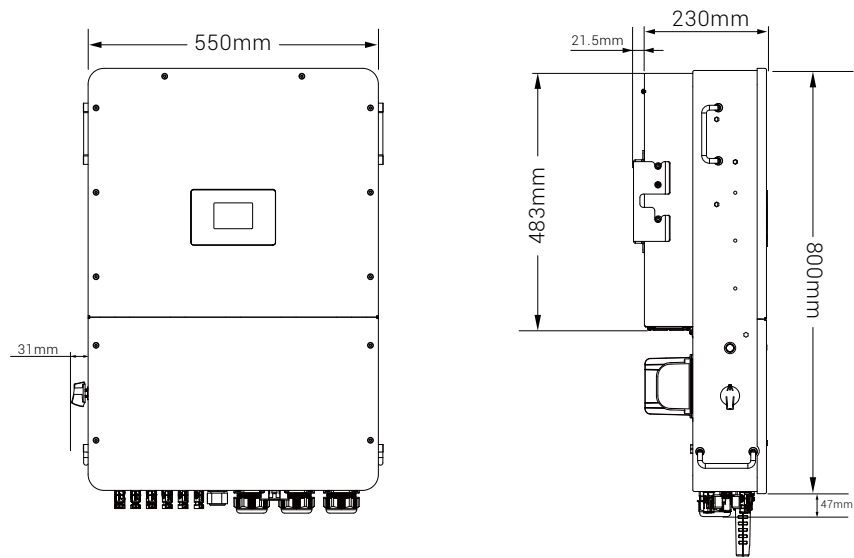
8 9 10 M40 Gland Cap: 7~7.5N·m



NOTE:

- ① Ensure the waterproof connector is tightened to prevent water from entering the machine.
- ② Attention should be paid to the installation direction of the COM port waterproof groove: the grooved part should face outward.
- ③ Due to the difference of cable specification(material、structure) and working environment and

3.3.2 Dimension Introduction



3.3.3 Indicator Description

LED indicator		Meaning
DC	Green Light On	PV port voltage connection is normal (160<PV Voltage<1000V)
	Green Light Flashing	PV is connected, but PV voltage is abnormal (60V<PV Voltage<160V or PV Voltage>1000V)
	Light Off	PV not connected (PV Voltage<60V)
AC	Green Light On	Grid port connection normal (grid is normal)
	Green Light Flashing	Grid connected, but with abnormal grid voltage or frequency (abnormal grid status and voltage > 36Vac)
	Light Off	Grid not connected (abnormal grid status and voltage <36Vac)
Normal	Green Light On	Inverter function is normal
	Green Light Flashing	Inverter function abnormal, off-grid port powered, in bypass state (1s interval blinking)
Alarm	Red Light On	System Fault

Description of firmware upgrade: LCD screen will show percentage of updating progress.

3.3.4 Nameplate Descriptions

*Nameplate is for reference only, please refer to the real thing.

HYBRID INVERTER

Model:

PV Input	
Max. Input Voltage	1000 d.c.V
MPPT Voltage Range	160 - 850 d.c.V
Max. Input Current	** d.c.A
I _{sc} PV (Absolute Maximum)	** d.c.A
Battery Data	
Battery Type	Li-ion
Battery Voltage Range	160 - 750 d.c.V
Max. Charge / Discharge Current	** d.c.A
AC Grid Side (On-Grid)	
Rated / Max. Output Power	** W
Rated / Max. Output Apparent Power	** VA
Nominal Voltage	3L/N/PE, 220/380 a.c.V; 230/400 a.c.V
Rated Input / Output Current (@220V)	** a.c. A
Rated Input / Output Current (@230V)	** a.c. A
Max. Input / Output Current	** a.c.A
Nominal Frequency	50/60 Hz
Backup Port (AC)	
Max. Output Apparent Power	** VA
Nominal Voltage	3L/N/PE; 230/400 a.c.V
Max. Output Current	** a.c.A
Nominal Frequency	50/60 Hz
GEN Port (AC)	
Max. Input Apparent Power	** VA
Nominal Voltage	3L/N/PE; 220/380 a.c.V; 230/400 a.c.V
Max. Input Current	** a.c.A
Nominal Frequency	50/60 Hz
Others	
Operating Temperature Range	-25°C to +60°C
Ingress Protection	IP66
Protective Class	I
Overvoltage Category	III (AC), II (DC)
Inverter Topology	Non-isolated
AC Side Power Factor	~1 (0.8 leading ... 0.8 lagging)














SN:

Hiconics Eco-energy Drive Technology Co., Ltd.
 No.3 Boxing 2nd Road, Economic and Technological Development Zone, 100176,
 Beijing, P.R. China
 Tel: +86 10 5918 0033 Email: hiconics_service@midea.com
www.hiconics-global.com

MADE IN CHINA

Product Technical
Parameters

Description of product
safety symbols and
certification marks

Serial number information,
contact details

4 Equipment Installation

4.1 Packaging, Transportation, Storage

- The system cabinet is packed in cardboard packaging and the internal PE packaging bag is moisture-proof and waterproof.
- Use EPE pearl cotton foam pad in the middle to prevent damage to the system during handling and transportation.
- Transportation must comply with UN3481's dangerous goods transportation and local laws and regulations.
- The system is heavy and must use the mechanical handling.
- Transportation temperature: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$.
- The equipment and packaging cannot be sprayed, so it cannot be transported in the open air.
- Storage temperature:
 - ◆ $-20^{\circ}\text{C} \sim 35^{\circ}\text{C}$, 12months;
 - ◆ $-20^{\circ}\text{C} \sim 45^{\circ}\text{C}$, 3months;
 - ◆ $-20^{\circ}\text{C} \sim 55^{\circ}\text{C}$, 1month;(The SOC before storage is kept in the range of 30% to 60%)
- Storage humidity: 0%~100%RH (No condensation)
- The storage room should be kept ventilated, the room should be clean and dry, and it should be protected from dust and moisture.
- Storage room sunlight cannot be directly exposed to the system.

**Notice**

If the inverter needs to be used for a longer period of time, please store it in strict accordance with the following requirements to ensure the performance and safety of the equipment:

1. **Package protection:** keep the original package, please do not remove the outer box, make sure the desiccant inside the box is complete and not lost, prevent moisture and damage, check the package sealing to avoid moisture or foreign matter entering during storage.
2. Choose dust-free, non-corrosive and clean environment for storage, with suitable temperature and humidity and no condensation.
3. Stacking should be placed according to the direction indicated on the label of the box, inverted or sideways, the stacking height should not exceed the height limit indicated on the package, after stacking, make sure that there is no risk of tilting or falling, and if necessary, use straps for reinforcement.
4. If stored for a long period of time, the integrity of the package and the state of the storage environment should be checked every month, and the equipment should be checked and confirmed by professional personnel before it is put into operation before it is allowed to continue to be used.

4.2 Check Before Signing

When signing for the goods, please check the following carefully:

1. **Packaging Inspection:** Observe whether there are any signs of damage, deformation, open holes, cracks and other abnormalities in the packaging, if you find any damage, please do not unpack, contact the dealer immediately and provide photos or videos of the scene as proof.
2. **Model verification:** Confirm whether the inverter model on the package is the same as the order, if the model does not match, please do not unpack, and contact the dealer directly to help deal with it.
3. **Deliverables count and appearance check:** Check whether the type and quantity of the delivered content (such as accessories, certificate of conformity, etc.) are consistent with the list, and check whether the appearance of all delivered parts is intact, without scratches, dents or other damages. If there is any problem, please keep the original packaging, contact the dealer and provide detailed description of the problem and evidence.

4.3 Pre-installation Inspection

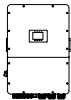
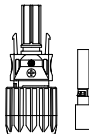
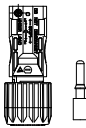
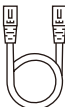
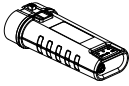


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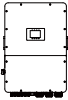
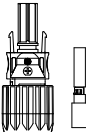
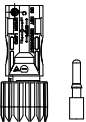
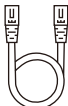
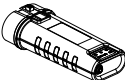
Please be cautious about unpacking the battery, otherwise components could be damaged.

Before installation, please check the equipment list carefully, if there is any damage or missing, please contact the dealer in time, do not buy non-compliant spare parts for installation.

Inverter packing list(15-20kW)

				
1x Hybrid Inverter	2x M6*12	4x M6*50	1x L-type Wrench	3x CT
				
1x Mounting Plate	2x Magnetic Core (MC-5322-b)	2x Magnetic Core (ES5284-01)	4x PV Male Connector (black)	4x PV Female Connector (black)
				
4x OT Terminal	18x AWG24 Wire Terminals	15x AWG6 Wire Terminals	1x BAT Wire-End Female Connector (blue)	1x BAT Wire-End Male Connector (blue)
				
1x Cable	1x WIFI Dongle (optional)	1x Certificate	1x Quick Guide	

Inverter packing list(25-30kW)

				
1x Hybrid Inverter	2x M6*12	4x M6*50	1x L-type Wrench	3x CT
				
1x Mounting Plate	2x Magnetic Core (MC-5322-b)	2x Magnetic Core (ES5284-01)	6x PV Male Connector (black)	6x PV Female Connector (black)
				
4x OT Terminal	18x AWG24 Wire Terminals	15x AWG4 Wire Terminals	2x BAT Wire-End Female Connector (blue)	2x BAT Wire-End Male Connector (blue)
				
1x Cable	1x WIFI Dongle (optional)	1x Certificate	1x Quick Guide	

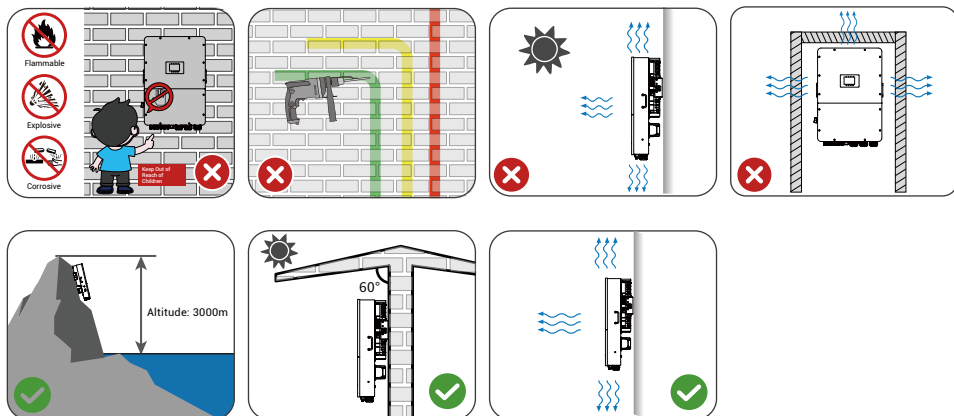
4.4 Installation Requirements

Installation Precaution

The product is designed for outdoor installation (IP 66). Make sure the installation site meets the following conditions:

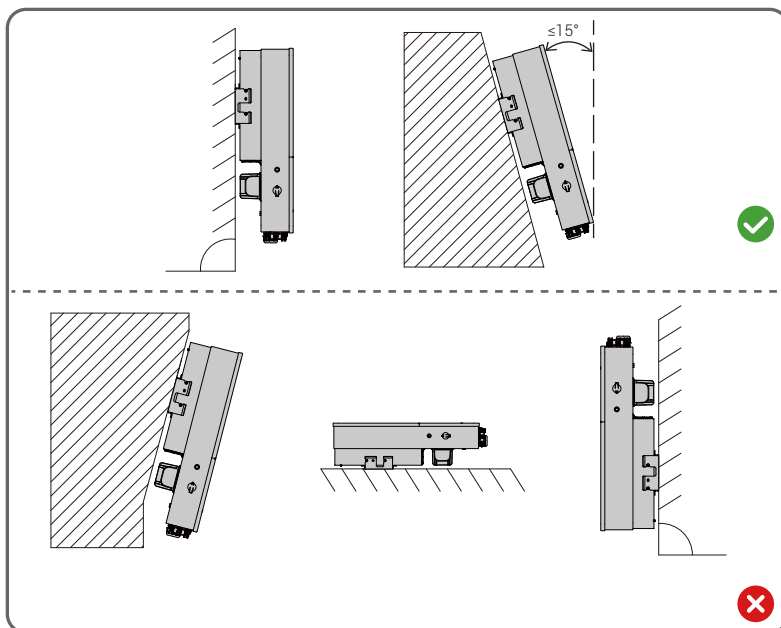
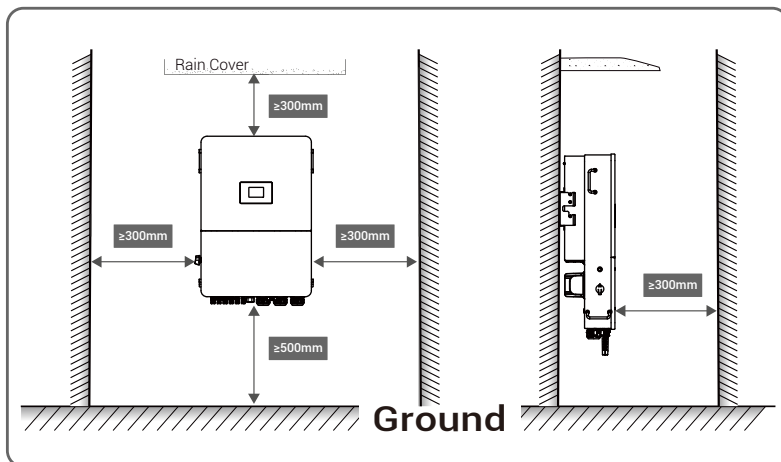
- Not in direct sunlight.
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 3000m above sea level.
- Not in environment of precipitation or humidity.
- Under good ventilation condition.
- The ambient temperature in the range of -25°C to $+60^{\circ}\text{C}$.
- The wall hanging the inverter should meet conditions below:
 1. Solid brick/concrete, or strength equivalent mounting surface;
 2. Inverter must be supported or strengthened if the wall's strength isn't enough
(Such as wooden wall, the wall covered by thick layer of decoration)

Physical environment: The product design meets IP66 standards, it can be installed indoors or outdoors, ensuring stability and reliability.



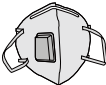
4.4.1 Mounting Angle Requirements

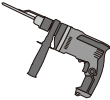
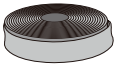
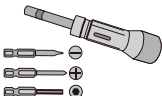
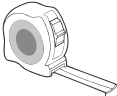
- Recommended inverter installation angle: vertical or tilted back $\leq 15^\circ$.
- Do not install the inverter upside down, tilted forward, tilted back beyond the angle, or horizontally.
- Please install this inverter at eye level to ensure that the LCD display can be read at all times.



4.4.2 Installation Tool Requirements

For installation, the following installation tools are recommended. If necessary, other auxiliary tools can be used on site.

Personal Protective Equipment			
			
Safety Gloves	Safety Goggles	Dust masks	Safety shoes

Installation tools			
			
Impact Drill (Φ10mm drill)	Torque Socket Wrench	Marker Pen	Vacuum Cleaner
			
Heat Shrink Tube	Torque Screwdriver	Steel Tape	Level Ruler
			
Electric Batch (with M6 socket)	Multimeter	Rubber Mallet	Wire Stripper
			
Wire Cutting Pliers	Crimping Pliers (for PV terminals)	Art Knife	RJ45 Crimping Pliers
			
Crimping Pliers (for AC terminals)	Cable Ties	Hot Air Gun	PV Plug Unlocking Tool

4.5 Installation Steps and Precautions

4.5.1 Handling Inverters



Caution

Before installation, you need to carry the inverter to the installation place, please pay attention to the following matters in order to avoid personnel injury or equipment damage during the carrying process:

1. According to the weight of the inverter, please allocate enough staff to carry the inverter. Ensure that the equipment is balanced and not tilted during the process to avoid the equipment tipping over and injuring the personnel;
2. Wear gloves during handling to avoid injury during handling;
3. The equipment should be held and put down gently during the process, and the equipment should not be placed directly on the ground.

When placing the equipment, make sure the socket is not in direct contact with the ground to prevent damage to the interface.

4.5.2 Installation of the Inverter



Notice

- When installing, make sure the wall has enough load bearing and the wall surface is flat.
- When installing, avoid all kinds of pipes and cables inside the wall to avoid any injury or danger caused by piercing the pipes and cables. The operator must wear a dust mask and goggles.

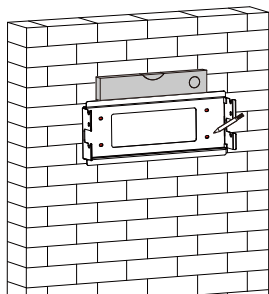
Step 1: Place the backplane horizontally on the wall or bracket, and use a marker to mark the location of the hole;

Step 2: Use an impact drill with a drill bit diameter of 8mm to make holes, ensuring that the hole depth is about 52mm;

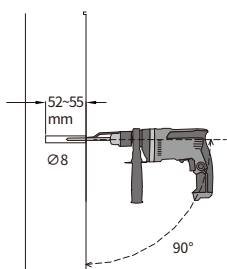
Step 3: Place the backplane on the hole, and fix it to the wall or bracket using the expansion screws M6*50mm;

Step 4: Mount the inverter on the backplane, and use the M6*12 screws on both sides of the backplane bracket fastening.

Step1



Step2



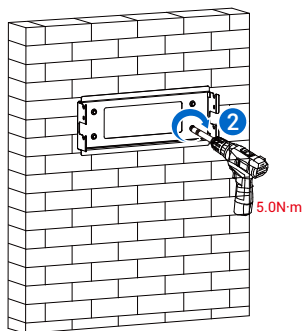
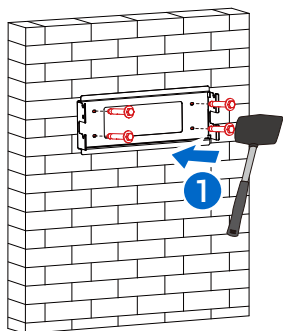
Drilling depth: 52~55mm



Level

Ø8mm

Step3

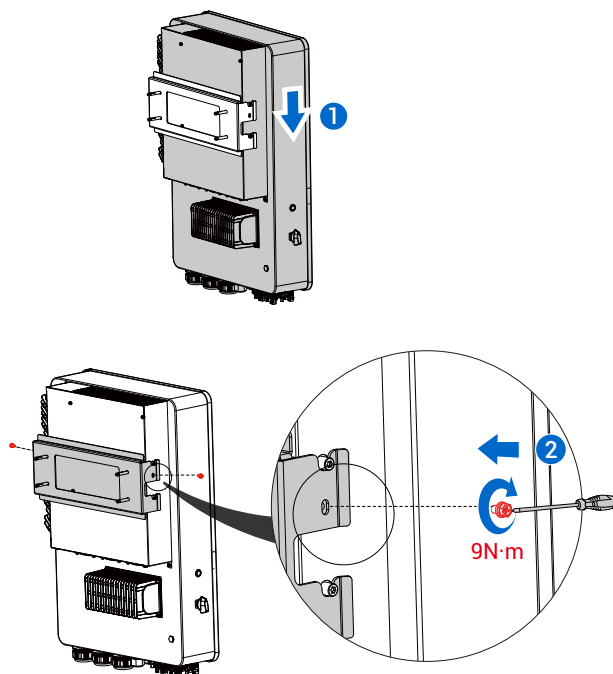


M6×50



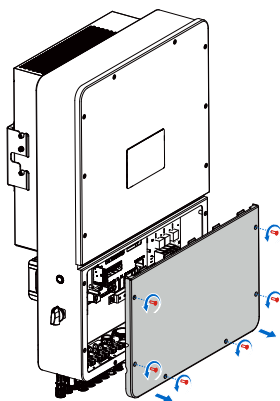
10mm

Step4



M6×12

Step5



Before internal wiring, the front cover of the Inverter needs to be opened.
After completing the wiring, the cover of the Inverter needs to be reattached and tightened.
(Recommended torque: 4~5N·m)



5 Electrical Connections

5.1 Safety Precautions



Danger!

- Before electrical wiring, disconnect the DC isolation switch and AC output protection switch of the inverter to ensure that the DC and AC sides of the equipment are disconnected. It is prohibited to operate with electricity, which may lead to electric shock and endanger personal safety.
- All operations, cables and components used in the electrical connection process must comply with local laws and regulations.
- When connecting the cables, reserve a certain length of cable before connecting to the inverter connector; if a certain length is not reserved, the cable may be subjected to a large tensile force, resulting in a poor connection.



Notice

- Before making electrical connections, wear protective equipment such as helmets, safety shoes, insulated gloves, etc. as required.
- Only specialised technicians are allowed to carry out electrical installation and related operations.
- Cable sizes are subject to local regulations and the cable colours shown in the brochure are for reference only.

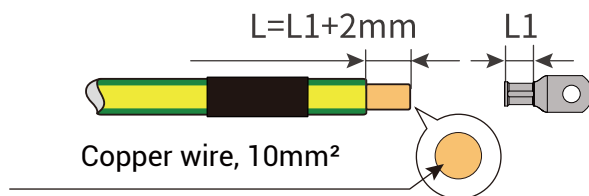
5.2 Protection Ground Wiring Connection



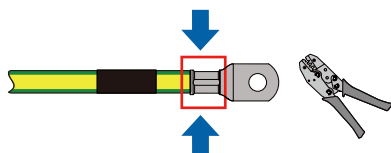
Warning!

- The system ground of the AC output connector of the inverter and the protective ground of the chassis case must be connected reliably, and it is forbidden to connect only one of them;
- When more than one inverter is installed, make sure that all inverters are grounded reliably;
- After the installation of the protective earth wire, it is advisable to paint the outside of the earth terminal to improve the corrosion resistance of the terminal;
- Please provide your own protective earth wire for installation.
Recommended specifications :
Type: Outdoor single-core copper wire;
Conductor cross section: 10mm².

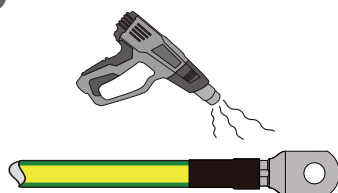
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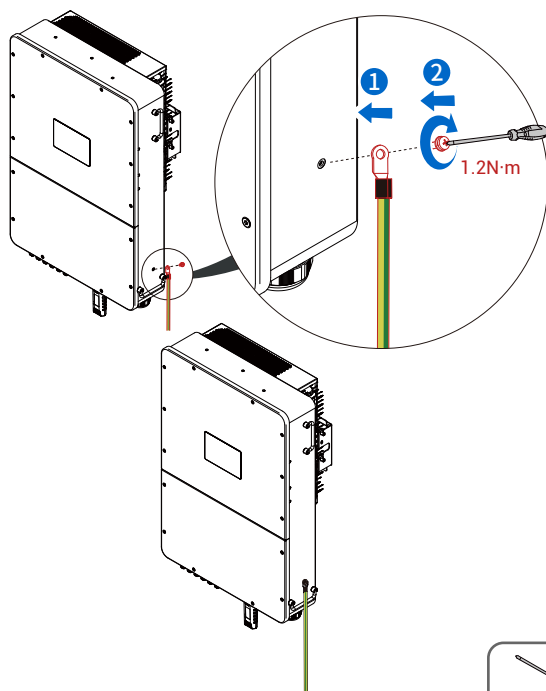
2



3



4



5.3 PV DC Input Connection



Danger!

• Before connecting the PV array to the PV DC input connector of the inverter, please make sure that the following conditions are met. Failure to meet these conditions may result in damage to the inverter, which may seriously endanger the safety of people and property.

1. Please ensure that the maximum operating current, short circuit current and maximum input voltage of MPPT to be connected to each string are within the allowable operating range of the inverter;
2. Please make sure that PV+ and PV- are wired in the correct order in the PV array, the positive pole of the corresponding PV array is connected to the PV+ connector of the inverter, and the negative pole of the PV array is connected to the PV- connector of the inverter;
3. It is recommended not to disconnect the DC PV switch under load. The machine should be shut down first, and then the switch should be disconnected;
4. It is recommended that the voltage difference between the two MPPTs be less than 250V.



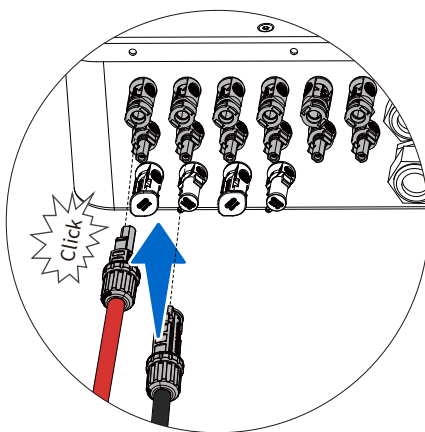
Warning!

- PV modules of different manufacturers and models should not be connected in the same MPPT, or PV modules with different tilting and azimuth angles should be strung in the same PV array, which will lead to a reduction in the power generation efficiency of the PV system;
- The maximum open circuit voltage of each PV array should not exceed 1000V;
- Please use the PV DC connectors in the inverter accessory kit. Using connectors of different manufacturers and specifications may lead to risky use of the equipment, and the damage caused by the equipment is not covered by the warranty;
- Before connecting the PV array to the PV input side of the inverter, please ensure that the minimum insulation resistance of the PV array meets the minimum insulation impedance requirement.
- Please provide your own PV DC cable for installation.
- To avoid equipment damage, do not connect PV array that may have leakage risks to the inverter. For example: grounded PV array.
- When selecting suitable PV array, please ensure to consider the following parameters:
 01. The open-circuit voltage (V) of the PV array does not exceed the maximum open-circuit voltage of the inverter's PV array.
 02. The open-circuit voltage (V) of the PV array should be higher than the minimum.
- PV array frame can be grounded, however, the PV array conductors(positive and negative)shall be ungrounded or float.

Recommended specifications:

Type: Outdoor PV cable that meets the maximum inverter input voltage and string short circuit current;

Conductor cross section: 4-6mm².



Notice

If there is no PV array wiring connect to the inverter PV input connector, please use the attached waterproof cover for the PV connector to block it, so as to avoid affecting the IP waterproof rating of the device and causing damage to the device.

PV DC Input Wire Terminal Installation Steps:

Step 1: Prepare DC cable that meets the requirements;

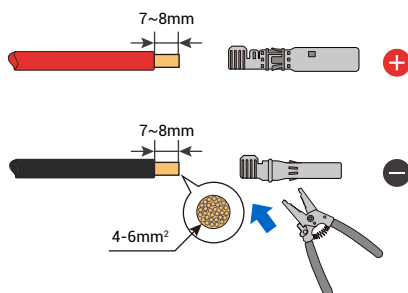
Step 2: Crimp the PV DC input terminal;

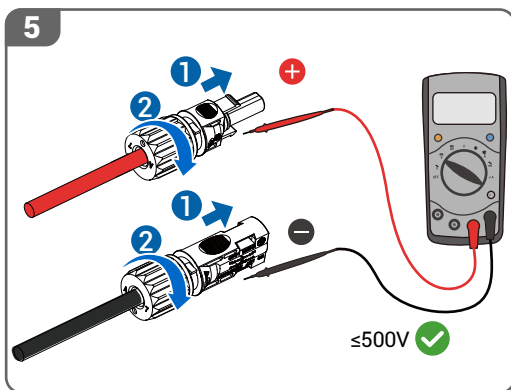
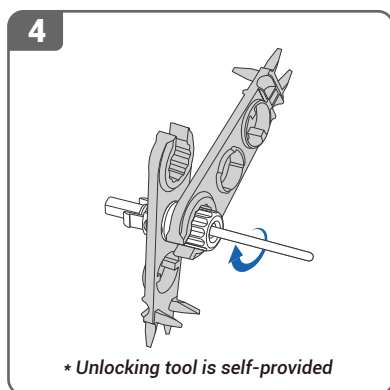
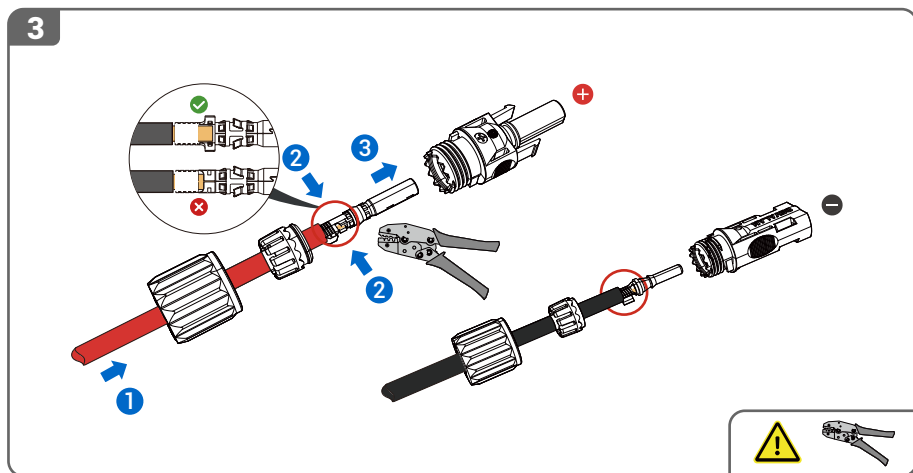
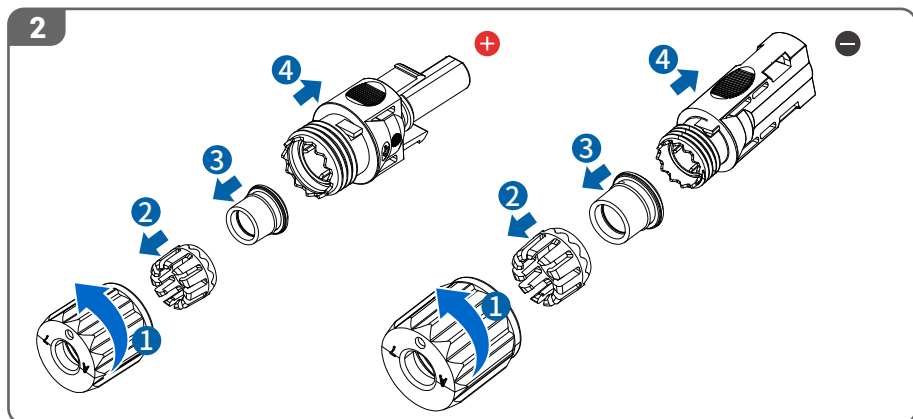
Step 3: Detach the PV DC connector;

Step 4: Make a DC cable and check the input voltage using a multimeter;

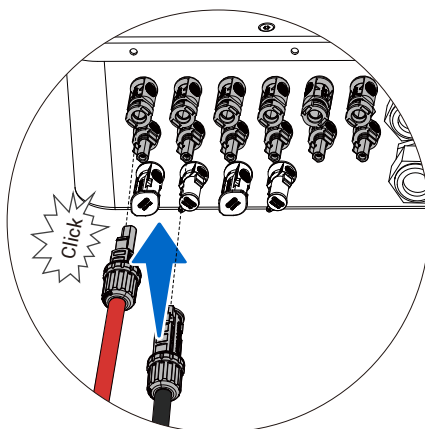
Step 5: Connect the DC connector of the string line end to the inverter PV DC input connector.

1





6



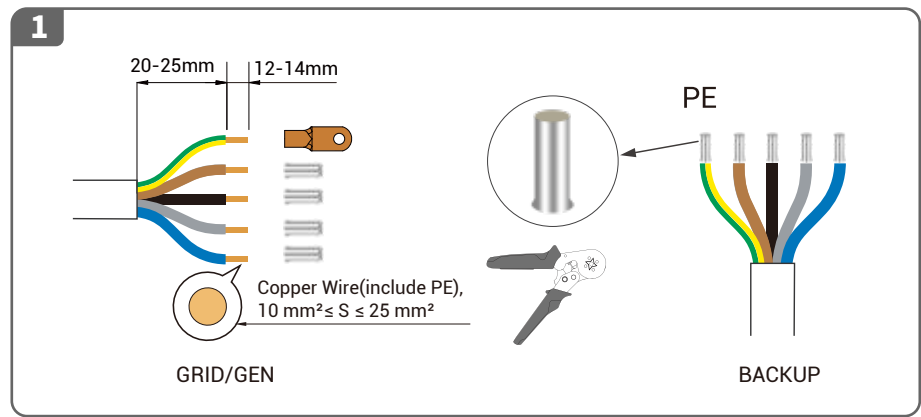
5.4 AC Output Connection



Caution

- It is strictly forbidden to connect the load without going through the AC protection switch of the inverter (i.e. between the inverter and the AC protection switch).
- The inverter is equipped with a residual current detection function. When the inverter detects a leakage current greater than the threshold value, it will immediately disconnect from the grid for protection.
- To ensure that there is a clear disconnection point between the inverter and the grid in the event of an inverter fault, an AC protective switch is connected to the AC output side of the inverter, and the corresponding protective switch is selected according to local regulations.
- Multiple inverters should be equipped with their own AC protection switches and should not be shared.
- There are "L1" "L2" "L3" "N" "PE", Symbols marked inside the connector, the Live wire of grid must be connected to "L1" "L2" "L3" terminal; the Neutral wire of grid must be connected to "N" terminal; the Earth of grid must connect to "PE".

- Step 1:** Crimp the AC output cable tube terminals;
- Step 2:** Disassemble the AC connector and tighten the screws;
- Step 3:** Secure the AC output cable to the AC connector and tighten the screws;
- Step 4:** Secure the connector external waterproof cover to the inverter AC connector port..



Inverter Model	GRID Connector				GEN Connector		BACKUP Connector			
	Cable		Torque value	Cable		Torque value	Cable		Torque value	
MH-HYIV15.0-TH-S4(-AU)	10mm ²	8AWG	1.2N·m	10mm ²	8AWG	1.2N·m	6mm ²	10AWG	1.2N·m	
MH-HYIV20.0-TH(-AU)	16mm ²	6AWG		16mm ²	6AWG		6mm ²	10AWG		
MH-HYIV25.0-TH(-AU)	16mm ²	6AWG		16mm ²	6AWG		10mm ²	8AWG		
MH-HYIV29.9-TH(-AU)	25mm ²	4AWG		25mm ²	4AWG		10mm ²	8AWG		
MH-HYIV30.0-TH(-AU)	25mm ²	4AWG		25mm ²	4AWG		10mm ²	8AWG		

* The diameter and material of PE wire is the same as power cable.
The ground wire connected to the distribution box, and the wire from the electrical distribution box to the earth should be at least 10mm² Copper Wire



Australia New Zealand South Africa

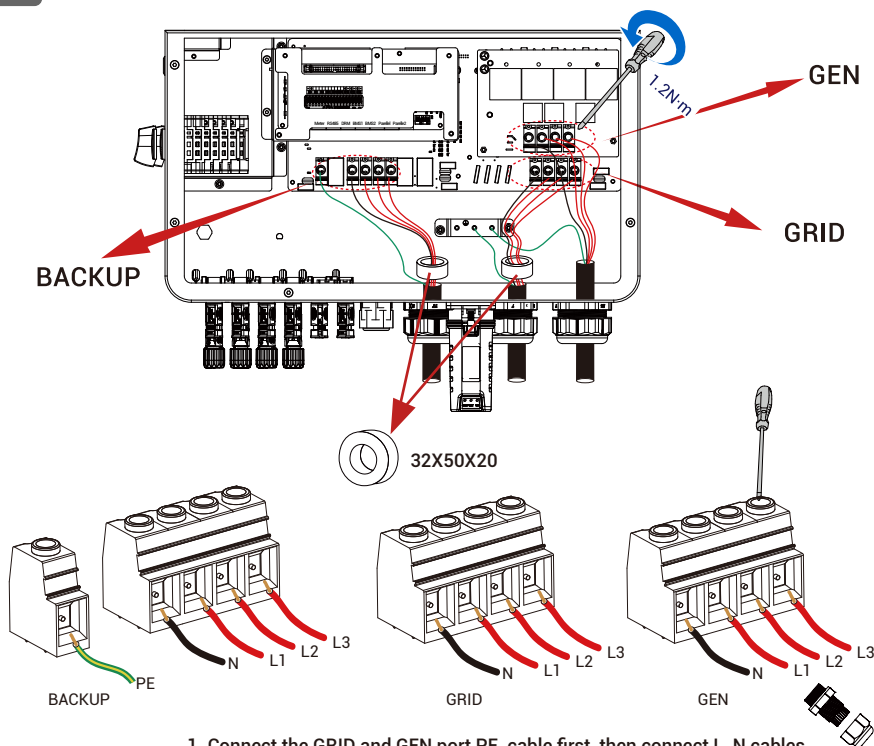
The PE terminal of BACKUP in the countries above is not wired and N terminal is connected to ground cable



Warning!

- Ensure that the wire core is connected to the AC output connector terminal hole without any exposure;
- Ensure that the cables are reliably connected to the AC output connectors, otherwise there is a risk of damage to the inverter due to heat generation at the terminals.

2



1. Connect the GRID and GEN port PE cable first, then connect L, N cables.
2. The PE of the BACKUP port must be grounded, otherwise, the equipment cannot operate normally.
3. If the installation is not carried out according to the recommended wire diameter range, it may result in IP failure, product damage, and impact on safety.
4. Before installing the cable, the gland nut needs to be unscrewed, and the wire should pass through the gland nut. After installation is complete, the gland nut needs to be reassembled.



Notice



Notice

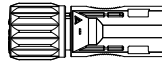
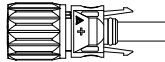
After the installation is completed, it is necessary to check whether the wiring sequence is correct, whether the wiring is solid, and remove the construction debris left at the site. The AC output connector needs to be sealed to ensure the system protection level.

5.5 Battery Connection

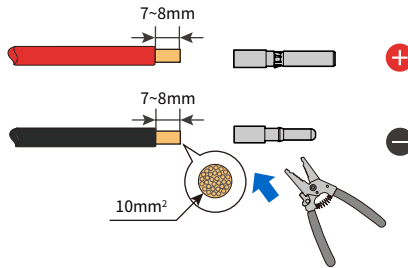


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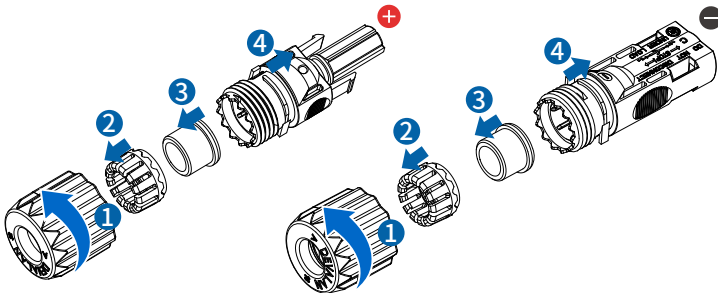
1. Before installation, please select the appropriate size battery cable and the correct connector to ensure a good fit to the battery terminals.
2. Ensure that the positive and negative terminals of the batteries and the inverter are correctly connected.



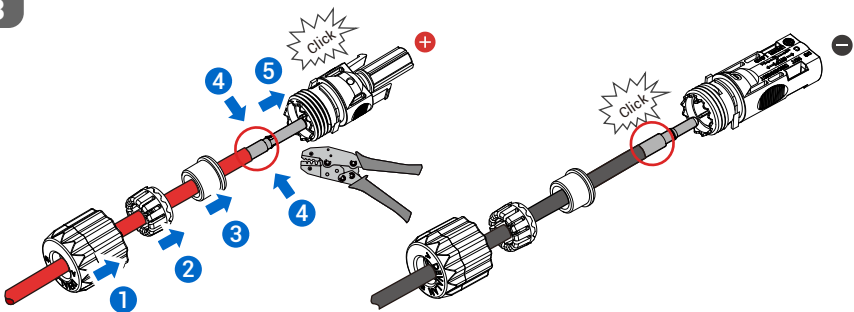
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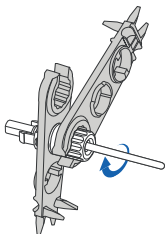
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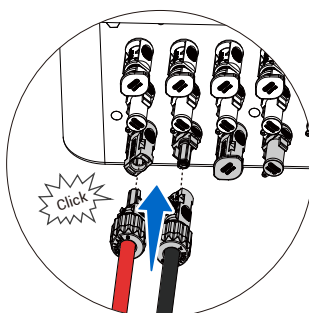
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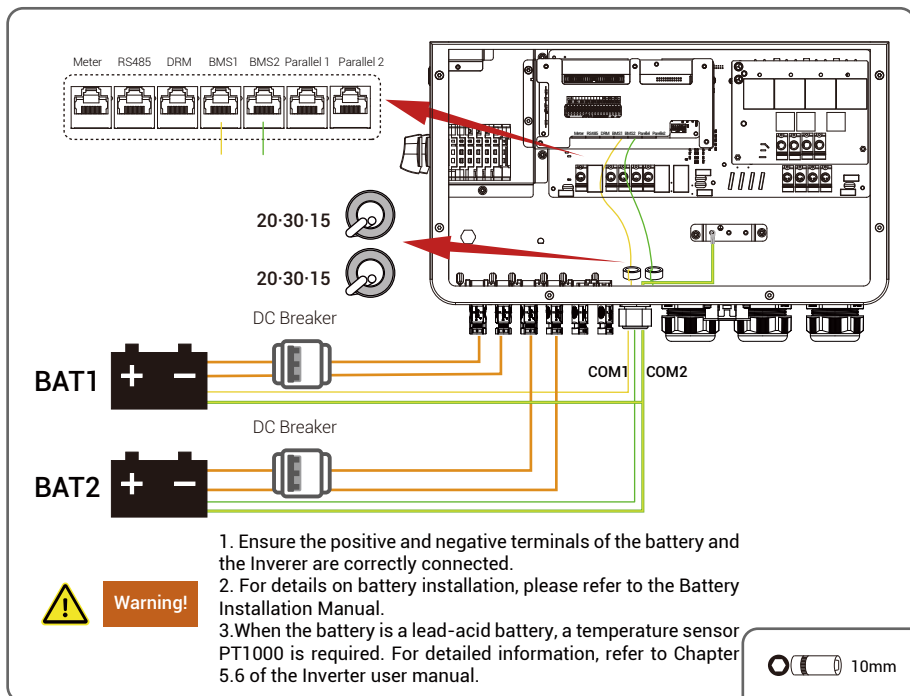
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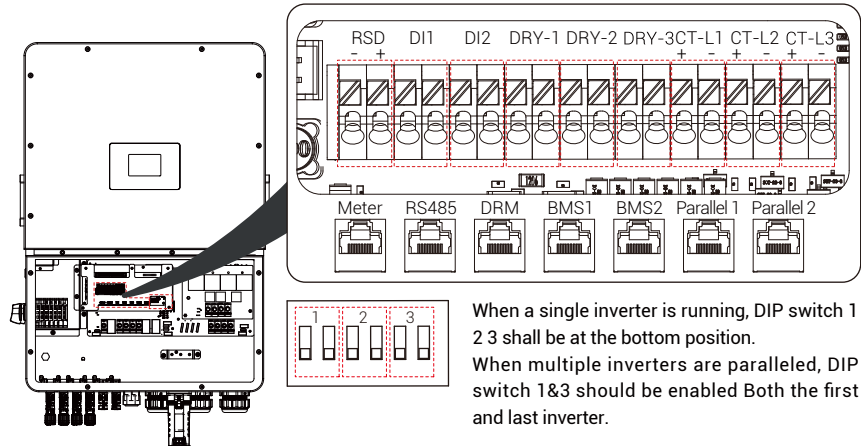


Inverter Model	BAT Connector		
	Cable		Torque value
MH-HYIV15.0-TH-S4(-AU)	10mm ²	6AWG	4N·m
MH-HYIV20.0-TH(-AU)	10mm ²	6AWG	
MH-HYIV25.0-TH(-AU)	10mm ² +10mm ²	6AWG+6AWG	
MH-HYIV29.9-TH(-AU)	10mm ² +10mm ²	6AWG+6AWG	
MH-HYIV30.0-TH(-AU)	10mm ² +10mm ²	6AWG+6AWG	



5.6 Hybrid Inverter Communication

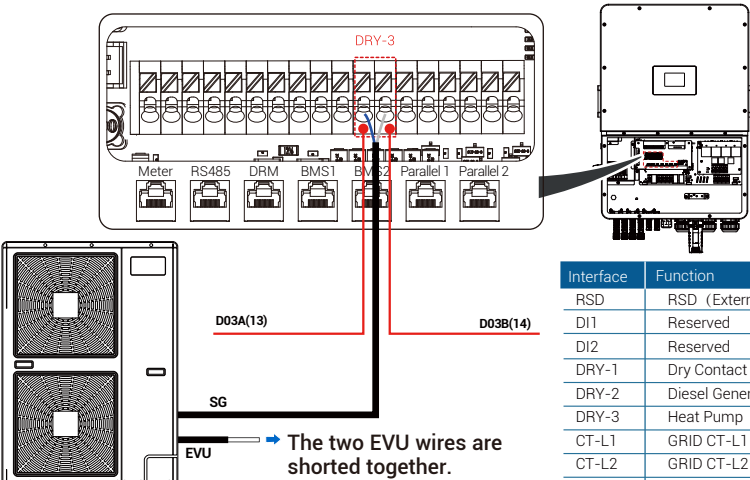
5.6.1 External Interface



When a single inverter is running, DIP switch 1 2 3 shall be at the bottom position.
When multiple inverters are paralleled, DIP switch 1&3 should be enabled Both the first and last inverter.

Interface	Function
RSD	External Controlled 12V
DI1/DI2	External Dry Contact Inputs
DRY-1	Dry Contact (Reserved)
DRY-2	Diesel Generator
DRY-3	Heat Pump
CT	GRID CT

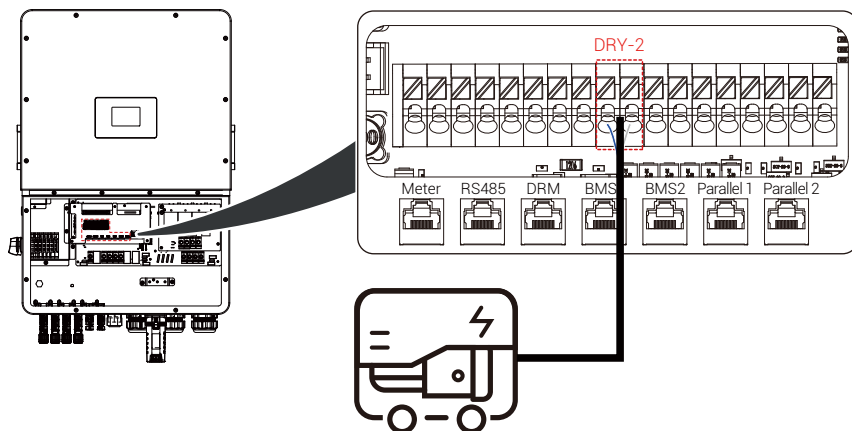
5.6.2 Heat Pump Connection



Interface	Function
RSD	RSD (External Controlled 12V)
DI1	Reserved
DI2	Reserved
DRY-1	Dry Contact (Reserved)
DRY-2	Diesel Generator
DRY-3	Heat Pump
CT-L1	GRID CT-L1
CT-L2	GRID CT-L2
CT-L3	GRID CT-L3

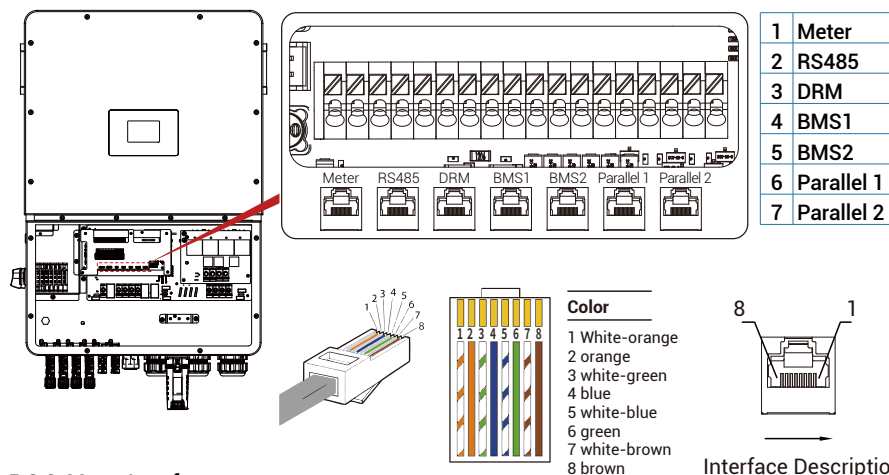
The heat pump is subject to the actual product.

5.6.3 Diesel Generator Connection



Interface	Function	Interface	Function
RSD	RSD (External Controlled 12V)	DRY-3	Heat Pump
DI1	Reserved	CT-L1	GRID CT-L1
DI2	Reserved	CT-L2	GRID CT-L2
DRY-1	Dry Contact (Reserved)	CT-L3	GRID CT-L3
DRY-2	Diesel Generator		

5.6.4 Communication Connection



5.6.6 Meter Interface

You must connect external CTs or a smart meter between the inverter and the powergrid. If you want to connect a smart meter, note that only one meter is necessary for each inverter. The meter must be mounted and connected at the grid transition point (feed-in point) so that it can measure the grid reference and feed-in power.

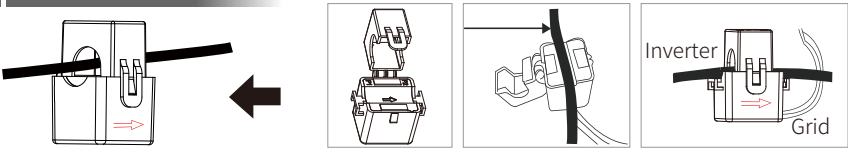
Pin	Description	Pin	Description
1	485 6A	5	NA
2	485 6B	6	NA
3	NA	7	NA
4	NA	8	NA

5.6.5.1 CT Connection

Open the external CT wiring port, the arrow points to the direction of the power grid, put the wire into the external CT card slot, and buckle the buckle.

General Installation Example

CT universal wiring

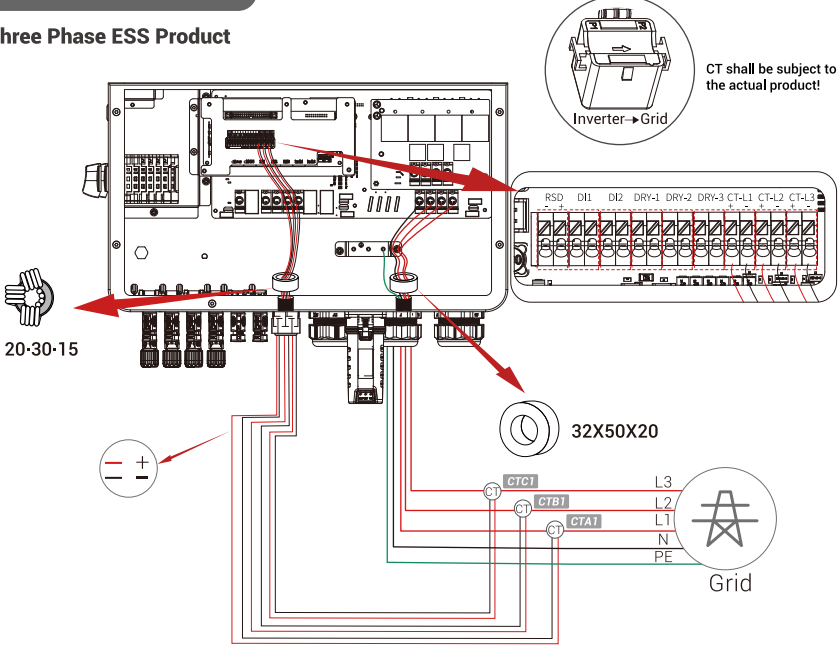


Inverter → Grid
CT shall be subject to the actual product!

Open the CT cap, place it on the grid main line "L" cable so that the arrow of the CT points towards the direction of the power grid, and then close the cap.

Three Phase Grid + CT

Three Phase ESS Product



CT shall be subject to the actual product!

Inverter → Grid

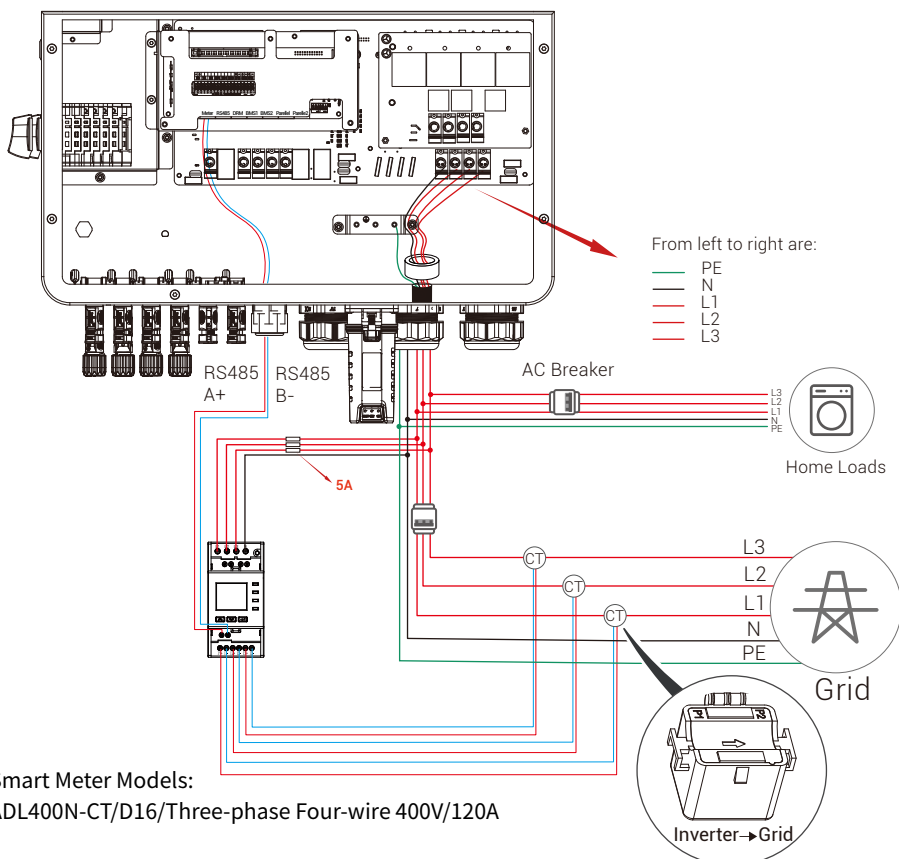
20-30-15

32X50X20

Grid

5.6.5.2 Meter Connection

The electricity meter should be mounted and connected at the grid transition point (feed-in point) so that it can measure the grid reference and feed-in power.



Smart Meter Models:

ADL400N-CT/D16/Three-phase Four-wire 400V/120A

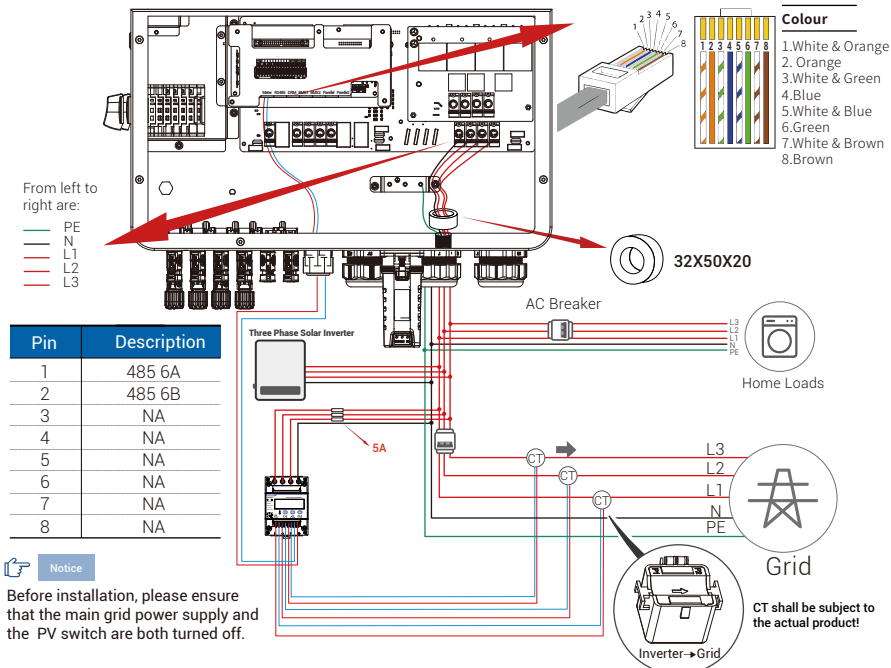


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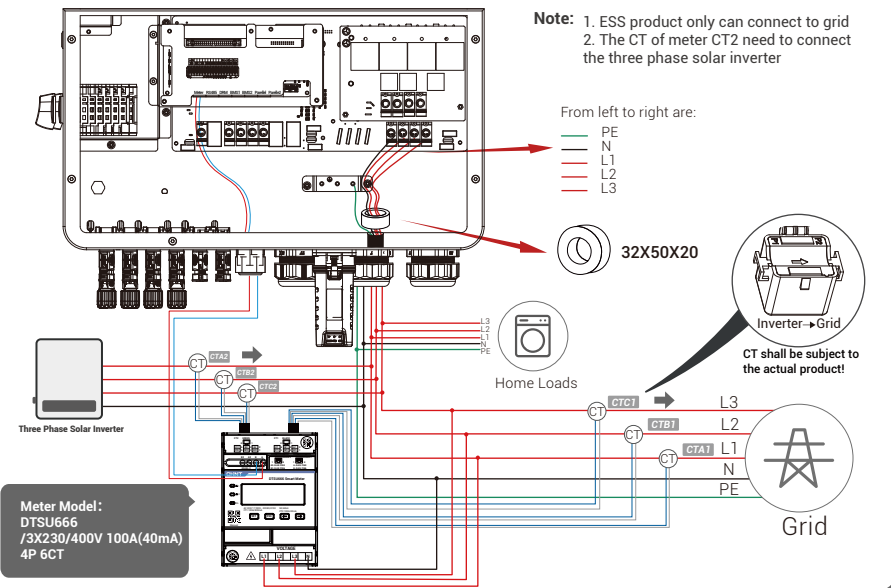
Note:

Make sure the grid main power and PV switch are turned off during the installation.

Three Phase Grid + AC Couple (Three Phase Solar Inverter) + Three Phase CHINT Meter (3 CT)



Three Phase Grid + AC Couple (Three Phase Solar Inverter) + Three Phase CHINT Meter (6 CT)



5.6.6 RS485 Interface

Pin	Description	Pin	Description
1	485 7A	5	NA
2	485 7B	6	NA
3	NA	7	NA
4	NA	8	NA

5.6.7 DRM Interface (Optional)

This interface is a dry contact (only for Australia)

DRM means demand response enable device. The AS/NZS 4777.2:2020 required inverter need to support demand response mode (DRM). This function is for inverter that comply with AS/NZS 4777.2:2020 standard. Inverter is fully comply with all DRM. A RJ45 is used for DRM connection.

Pin	Description	Pin	Description
1	CT1-	5	REF
2	DRM2/6	6	DRN0
3	DRM3/7	7	VCC
4	DRM4/8	8	GND

DEMAND RESPONSE MODES (DRMs)

Mode	Requirement
DRM 0	Operate the disconnection device
DRM 1	Do not consume power
DRM 2	Do not consume at more than 50% of rated power
DRM 3	Do not consume at more than 75% of rated power AND Source reactive power if capable
DRM 4	Increase power consumption (subject to constraints from other active DRMs)
DRM 5	Do not generate power
DRM 6	Do not generate at more than 50% of rated power
DRM 7	Do not generate at more than 75% of rated power AND Sink reactive power if capable
DRM 8	Increase power generation (subject to constraints from other active DRMs)

5.6.8 BMS1/2 Interface

Pin	Description	Pin	Description
1	NA	5	NA
2	NA	6	NA
3	CAN_H	7	NA
4	CAN_L	8	NA

5.6.9 Parallel 1/2 Interface

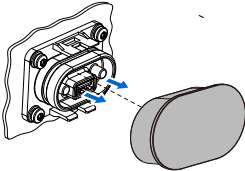
This interface is used to implement the inverter parallel function. The communication between parallel inverters is CAN.

Pin	Description	Pin	Description
1	Lf_Sync	5	485_2B
2	DGND_ISO	6	CANL_DSP_Para
3	CANH_DSP_Para	7	ARM_CAN0_H
4	485_2A	8	ARM_CAN0_L

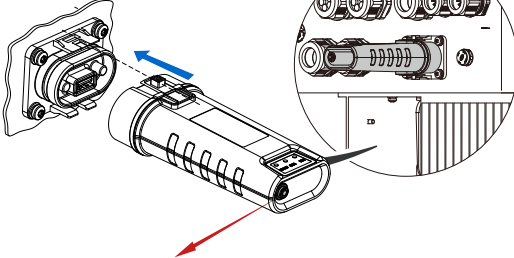
5.6.10 WiFi Module Connection (optional)

Plug the WiFi module (optional) into the corresponding port;

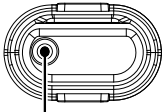
You can connect to mobile phone or WEB interface through 4G/WIFI communication module (optional) to set relevant parameters, view operation information and understand the working status of the system.



** Before installing the Wi-Fi Dongle, the dust cover must be opened.*



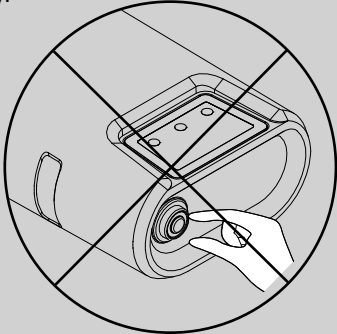
Press (3s) for network distribution and confirmation (release when NET indicator flashes quickly).



Reset/Commissioning/
Confirmation



Warning!
Do not remove the SETTING soft rubber button on the from the dongle body.



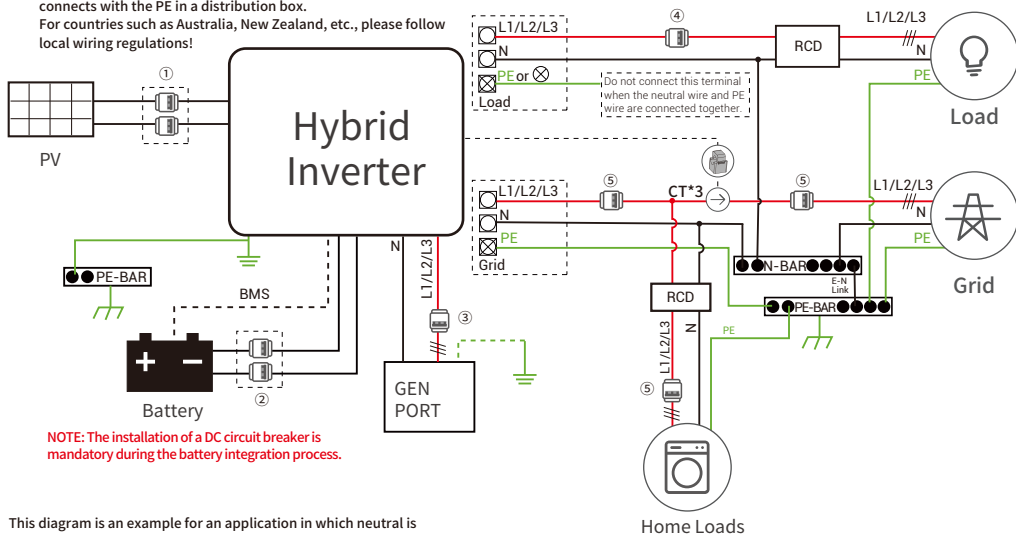


Notice

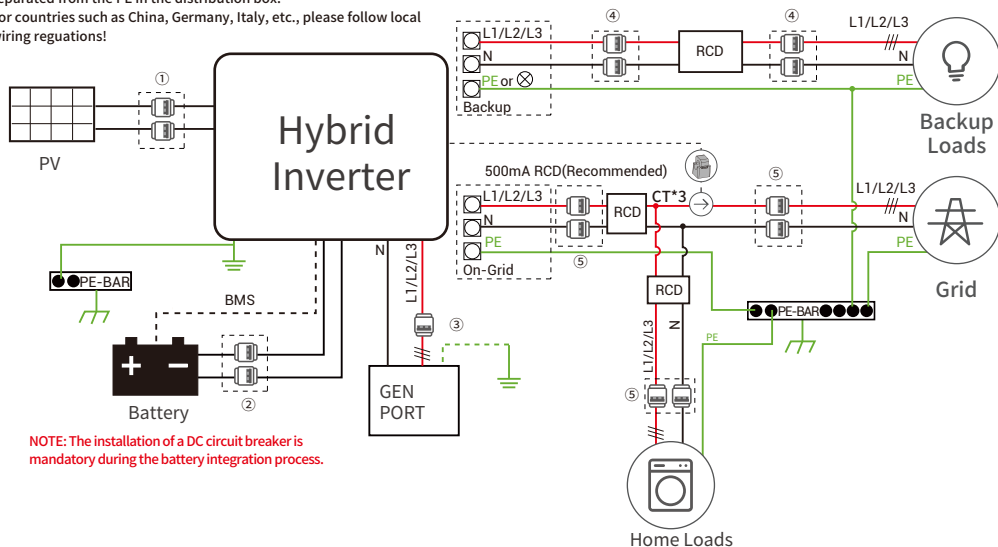
Please refer to the corresponding distribution information for the communication module introduction, and get more information from the official website.

5.7 Hybrid Inverter Wiring

This diagram is an example for an application that neutral connects with the PE in a distribution box.
For countries such as Australia, New Zealand, etc., please follow local wiring regulations!

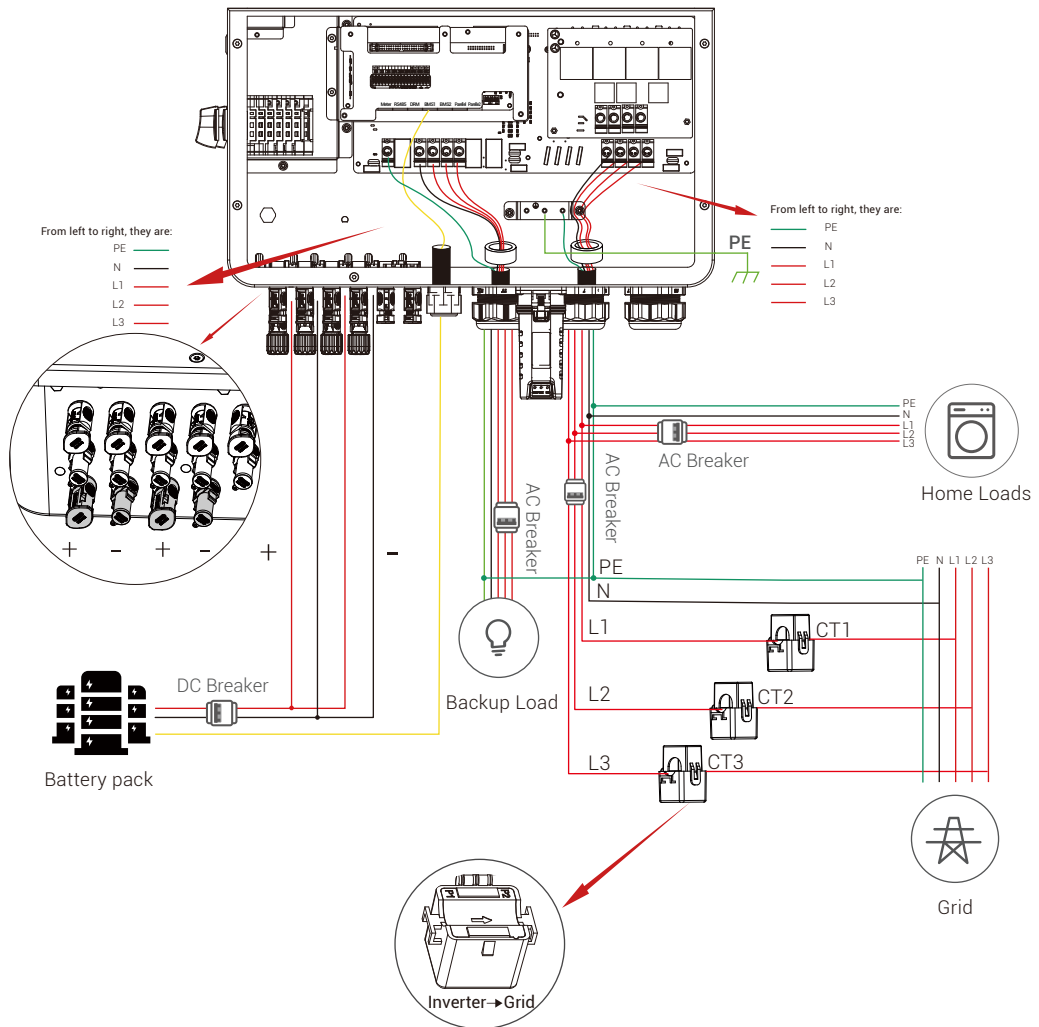


This diagram is an example for an application in which neutral is separated from the PE in the distribution box.
For countries such as China, Germany, Italy, etc., please follow local wiring regulations!



NO.	①	②	③	④	⑤
MH-HYIV15.0-TH-S4(-AU)	≥50A/≥1000V DC Breaker	≥63A/≥750V DC Breaker	≥63A/≥400V AC Breaker	≥32A/≥400V AC Breaker	≥63A/≥400V AC Breaker
MH-HYIV20.0-TH(-AU)			≥80A/≥400V AC Breaker	≥40A/≥400V AC Breaker	≥80A/≥400V AC Breaker
MH-HYIV25.0-TH(-AU)			≥100A/≥400V AC Breaker	≥50A/≥400V AC Breaker	≥100A/≥400V AC Breaker
MH-HYIV29.9-TH(-AU)			≥125A/≥400V AC Breaker	≥63A/≥400V AC Breaker	≥125A/≥400V AC Breaker
MH-HYIV30.0-TH(-AU)					

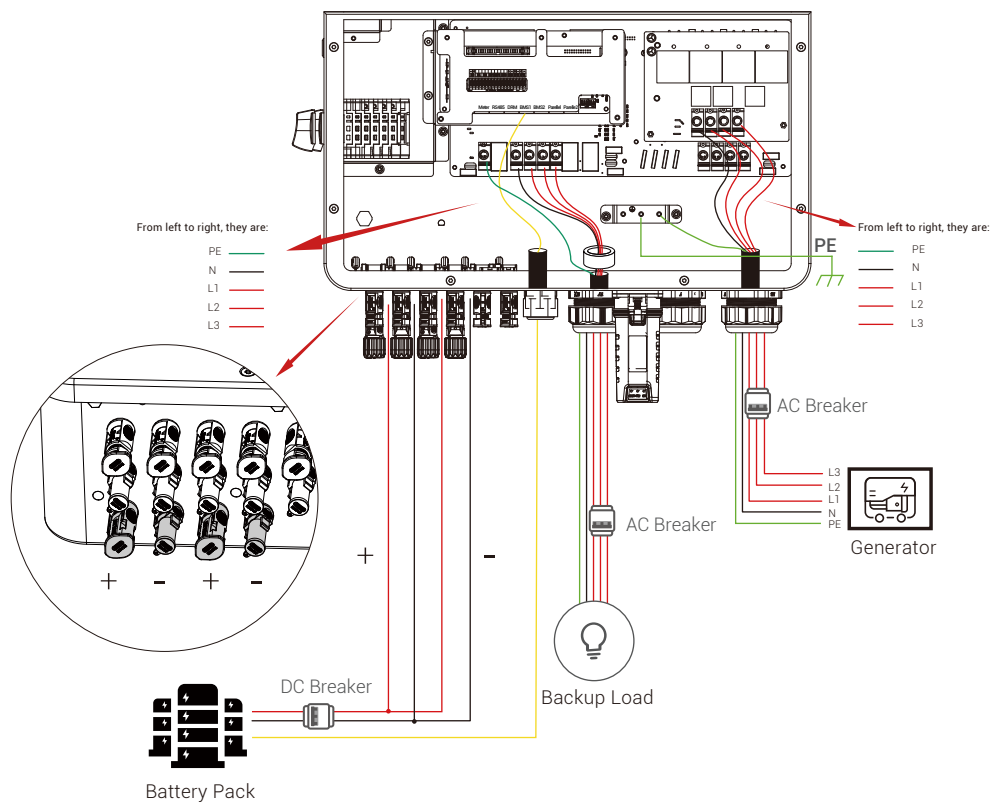
5.8 Typical application diagram of on-grid system



CT shall be subject to the actual product!

5.9 Diesel Generator Application Examples

- L
- N
- PE
- CAN



5.10 Parallel Connection Diagram

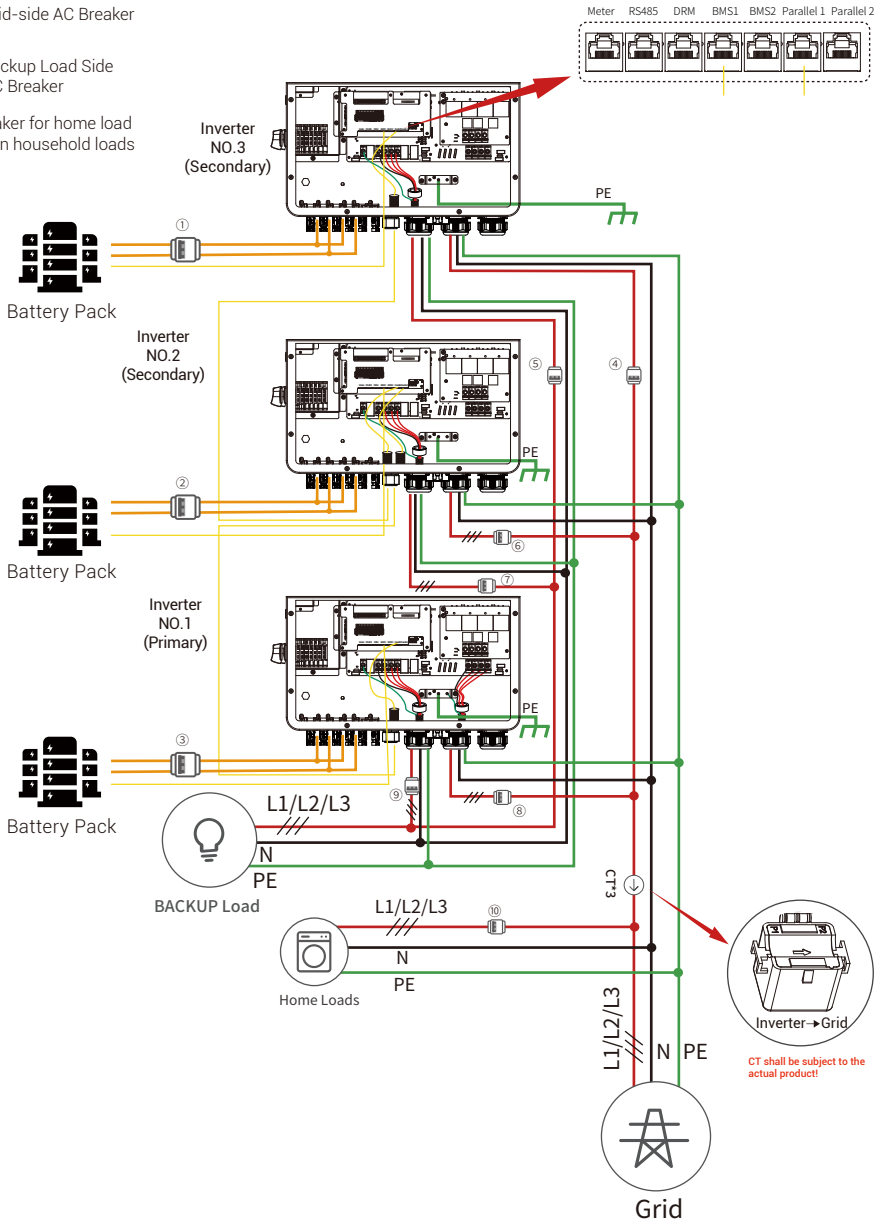
CAN L N PE

①②③ Battery DC Breaker

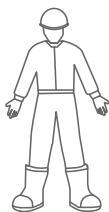
④⑥⑧ Grid-side AC Breaker

⑤⑦⑨ Backup Load Side AC Breaker

⑩ AC Breaker for home load
Depends on household loads



6 Equipment Commissioning



Preparations before turning on/off the machine.

For a safe operation, the inverter will automatically reduce the output power when the operating environment is not ideal.

The following are the factors that may occur power derating. Please try to avoid them during usage.

- Unfavorable environmental conditions, e.g., direct sunlight, high temperature, etc.
- Inverter's output power percentage has been set.
- Over-frequency derating.
- Higher input voltage value.
- Higher input current value.

6.1 Pre-power-on Inspection

NO.	Inspection Content
1	The inverter should be installed to avoid direct sunlight, avoid flammable and explosive explosion and other dangerous places, installed firmly, and the installation position is convenient for maintenance, and reserve space for heat dissipation;
2	Shell protective earth wire, DC input cable, AC output cable, communication cable is connected correctly, terminal connections firm;
3	The cable is firmly tied, the alignment is reasonable and does not interfere, and the outer insulation is not damaged;
4	Unused AC/DC and communication ports need to be blocked off;
5	The voltage and frequency of the AC output of the inverter meets the requirements for grid connection;

6.2 Equipment Power On

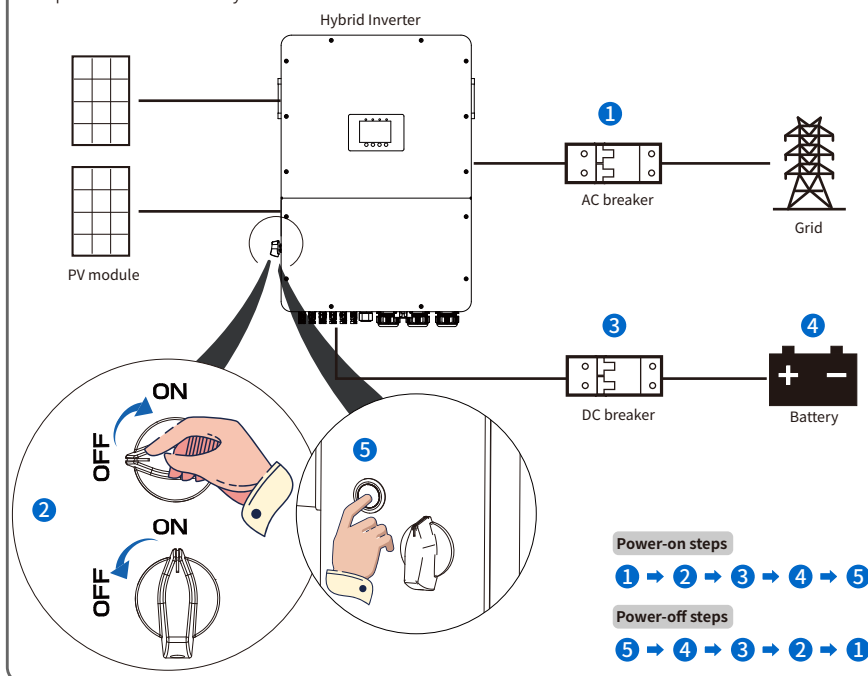
Step 1: Close the AC protection switch on the AC output side of the inverter;

Step 2: Close the DC disconnect switch of the inverter;

Step 3: Close the battery side DC breaker;

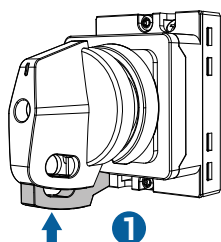
Step 4: Turn on the battery switch;

Step 5: Close the battery button Switch.

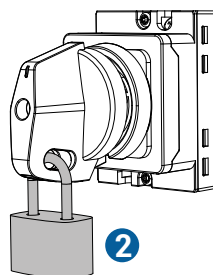


Lock the PV switch

The DC isolator shall be locked when the switch at off position for maintenance. The DC switch shouldn't be lock when the switch is st on position. Refer to the figure below for the locking method



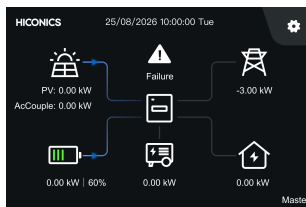
Push up to the position shown in the diagram and ensure the holes are aligned



7 LCD Introduction

7.1 Function Introduction

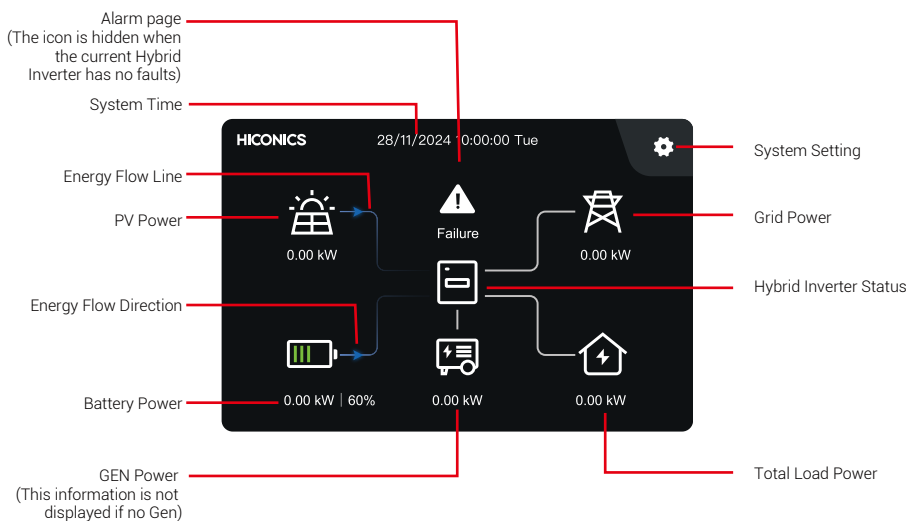
LCD function: for commissioning, maintenance and monitoring of System;



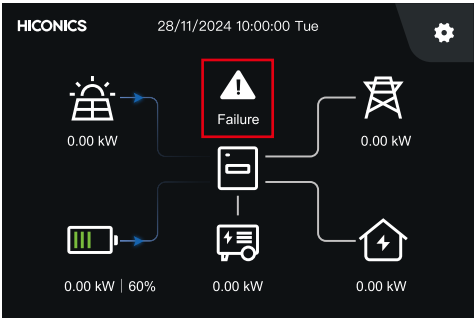
Main Screen

The LCD component consists of an LCD screen, a touch screen and a keypad. The LCD is used for display, the touch screen is used to receive the user's touch signals, and the keypad is used to receive the user's input signals.

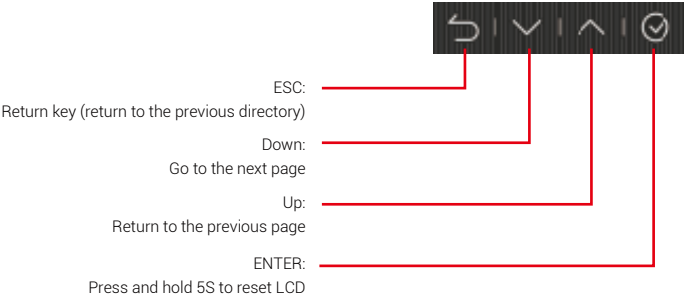
7.1.1 Description of Screen Content



- A grey energy line indicates no energy, a blue energy line indicates energy; Arrows indicate the direction of the energy flow.

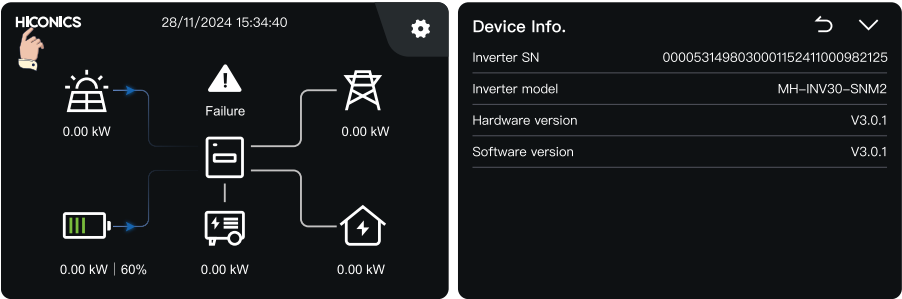


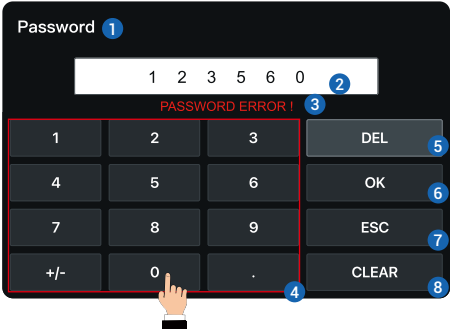
NOTE: The inverter is equipped with a visual ground fault alarm function. Once a ground fault occurs, the system will issue an alarm to take corrective measures; the alarm will notify the user through push notifications and messages; before the fault is resolved, the alarm will be displayed in the active fault list.



* There are some buttons on the page, click on these buttons page will go to the corresponding page, specific reference to the subsequent page instructions

* Click on the HICONICS logo to view Hybrid Inverter device information.





Set Up	Descriptions
①	Current Page Name;
②	The characters currently entered;
③	Tooltip: Indicates the maximum/minimum value range of the input box; Indicates whether the currently set number is successful;
④	Add the corresponding character to the text input box when a button is clicked;
⑤	Delete the current character;
⑥	After the user finishes inputting, click this button to send the current settings;
⑦	Cancel this parameter setting operation;
⑧	Clear all characters.

7.1.2 LCD Operation Flowchart



7.2 Introduction to LCD Statistical Interface

7.2.1 PV Operation Data

PV

PV Generation Energy

Today: 0.0 kWh Month: 0.0 kWh Total: 0.0 kWh

	U (V)	I (A)	P (W)
PV1	0	0	0
PV2	0	0	0
PV3	0	0	0

- ① PV Daily Power Generation, PV Monthly Power Generation, PV Total Power Generation;
- ② PV Voltage;
- ③ PV Current;
- ④ PV Power.

7.2.2 Battery Operation Data

Battery

Total Charge Energy
0

Total Discharge Energy
0

SOC	0	U(V)	0
SOH	0	I(A)	0
Number of battery	0	P(W)	0
Max Temp	0	Min Temp	0
Max CHG I(A)	0	Max DISC I(A)	0
Energy(kWh)	0	Protocol	HICONICS

- ① Total Battery Charge/Discharge Energy;
- ② Battery State of Charge;
- ③ Battery Voltage;
- ④ Battery Health Status;
- ⑤ Battery Current;
- ⑥ Total Number of Clusters;
- ⑦ Power;
- ⑧ Maximum and Minimum CELL Temperature;
- ⑨ Maximum Charging and Discharging Current;

7.2.3 Hybrid Inverter Operation Data

PCS



	U(V) 1	I(A) 2	Freq(Hz) 3	P(W) 4
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
Ambient Temp 5	0	INV Temp	0	6
DCDC Temp 7	0	PV Temp	0	8

- ① Inverter Side Voltage;
- ② Inverter Side Current;
- ③ Inverter Side Frequency;
- ④ Inverter Side Power;
- ⑤ Environmental Temperature;
- ⑥ Radiator Temperature;
- ⑦ DCDC Temperature;
- ⑧ PV Temperature.

7.2.4 GEN Operation Data

Generator

Total Generation Energy

Today Month Total

	U (V)	P (W)
A	0	0
B	0	0
C	0	0

- ① Daily Generation Energy; Monthly Generation Energy; Total Generation Energy;
- ② Generator Side Voltage;
- ③ Generator Side Power.

7.2.5 Grid Operation Data

GRID

Total Feed Energy

01

Total Sink Energy

02

	U(V)3	I(A)4	Freq(Hz)5	P(W)6
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0

- ① Total Grid feed in Power;
② Total electricity consumption;
③ Grid-side Voltage;
④ Grid-side Current;
⑤ Grid-side Frequency;
⑥ Grid-side Power.

7.2.6 Backup Operation Data (The statistical interface of important loads)

Load

Total Load Energy1

Today : 0 kWh

Month : 0 kWh

Total : 0 kWh

Power : 0 kWh

Backup Energy2

Today : 0 kWh

Month : 0 kWh

Total : 0 kWh

	U(V)3	I(A)4	Freq(Hz)5	P(W)6
A	0	0	0	0

- ① Total Load Energy;
②Daily Backup Consumption, Monthly Backup Consumption, Total Backup Consumption;
③ Backup Side Voltage;
④ Backup side Current;
⑤ Backup Side Frequency;
⑥ Backup Side Power.

7.2.7 Alarm Information

Alarm

CurAlarm1

1	NULL2	03	NULL4
2	NULL	0	NULL
3	NULL	0	NULL
4	NULL	0	NULL
5	NULL	0	NULL
6	NULL	0	NULL
7	NULL	0	NULL
8	NULL	0	NULL

- ① Alarm Selection: Current Alarm / Historical Alarm;
② Alarm Name;
③ Alarm Level: H: High; M: Middle; L: Low.
④ Alarm Time: Year, Month, Day / Hour, Minute and Second.

7.3 LCD System Configuration

7.3.1 Configure navigation

Main Config

Basic

System

Battery

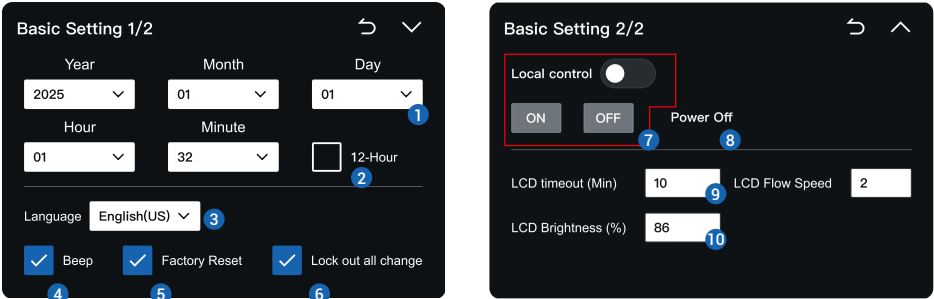
Gen Port

Grid

Advanced

Click  Enter the configuration navigation interface; if it is the first time to commission the inverter, the user needs to set the inverter time, meter or CT setting, grid standard, operation mode, battery type and protocol first.
If it involves parameter modification steps, you need to enter the Basic Setting interface to cancel "Lock out all change", and the password is 888888.

7.3.2 Basic Setting



Set Up	Descriptions
①	Set RTC time: Set Year, Month, Day, Hour, and Minute;
②	Time display format: Selected: Display for 12-hour; Not Selected: Display for 24-hour;
③	Language Selection
④	Selected: The buzzer will sound after OTA upgrade successfully or inverter powered on;
⑤	Click on Restore Parameters to Factory Values, you need to provide a password;
⑥	Selected: Lock all parameters to disallow modification; Enter the password to unlock;
⑦	You need to turn on this enable before the following on or off buttons will take effect; Click ON button:switch on; Click OFF button: switch off;
⑧	Hybrid Inverter Switching Status;
⑨	LCD Timeout Time:default 2 minutes; it will be locked automatically after the screen is automatically turned off;
⑩	LCD Brightness Setting:10~100% adjustable, default 80% brightness.

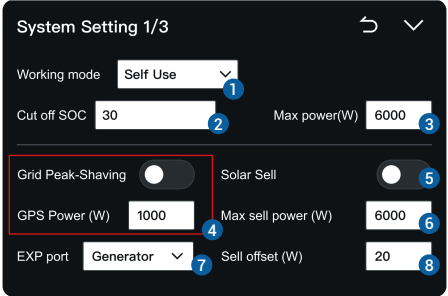


Notice

①②is the configuration parameter of time class. You can manually configure the current time and time display format. (If the system time is available, the home page will be in system time.)

⑦⑧ is for the remote control function, and the device switching status display. Both belong to a class of functions. The switching machine setting is only the control action sent, and the response depends on the switching status.

7.3.3 System Setting



Set Up	Descriptions
①	Working mode: Self Use, Sell First, Back Up, Custom;
	Self Use: When solar energy is sufficient, the electricity generated by the photovoltaic system will prioritize supplying power to the load. Excess electricity will be stored in the battery, and any remaining energy will be fed into the grid. When solar energy is insufficient, the battery will discharge to supply power to the load. This improves the self-consumption rate of the photovoltaic system and the energy self-sufficiency rate of the household, reducing electricity purchase costs.
	Self First: The PV power generation can be maximized and fed into the grid.
②	Back Up: Under the condition that the grid allows, the battery is maintained at a certain state of charge.
③	Battery Max. Power;
④	Grid Peak-shaving: When it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and battery as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.
⑤	Solar Sell: It is for Zero export mode: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge battery and feed into grid .
⑥	Max sell power: Maximum power allowed to flow into the grid (meter/CT required);

Set Up	Descriptions
⑦	EXP port: Gen port support Diesel generator / AC couple(Third party PV Inverter)/ smart load installation system you can select one of three options;
⑧	Sell offset: Power compensation settings apply to the maximum power for selling electricity, preventing over-selling and feed-in power during anti-backflow.

System Setting 2/3

TOU ☐ ①

Chg/Disc	Time	Max Power (W)	Batt (%)
② IDLE ▾	③ 01:00 05:00	④ 3000	⑤ 30
IDLE ▾	05:00 09:00	3000	30
IDLE ▾	09:00 13:00	3000	30
IDLE ▾	13:00 17:00	3000	30
IDLE ▾	17:00 21:00	3000	30
IDLE ▾	21:00 01:00	3000	30

System Setting 3/3

MON TUE WED THU FRI SAT SUN

⑥ ☐ ☒ ☐ ☐ ☐ ☐ ☐

Set Up	Descriptions
①	TOU: The configuration switch for managing battery charge/discharge time will only take effect once this is enabled. 0: Do not enable it 1: Enable
②	Charge/discharge time intervals are available : 0: Not enabled 1: Charging time slots 2: Discharge time period
③	Start and end times: 6 configured times need to cover 24 hours and be related to each other. Such as, for T1 end time period, the value range is [T1 start time period, T2 end time period]; after T1 start time period is modified, the start time period of T2 should be changed synchronously. Example: The first time slot is [1:00-5:00], the second time slot is [5:00-9:00] The end of the first period of time, and the beginning of the second period of time, can be modified in the range of [1:00-9:00] If the end time period of the first time period is changed to 6:00, the first time period is changed to [1:00-6:00], and the second time period need be changed to [6:00-9:00].
④	Max Power: If the time period is charging time period, it means the maximum charging power of the battery; if the time period is discharging time period, then here represents the maximum discharging power of the battery.
⑤	Target SOC/ Voltage: If it is configured as discharge time period, here is the minimum SOC/ voltage for discharge; if configured as charge time period, here is the maximum SOC/ voltage for charge. Note: If the battery type is lithium battery, the configurable item here is SOC, otherwise it is voltage.
⑥	Day of the week selection: Users can choose which day of the week they want to use the above TOU function from Monday to Sunday.

7.3.4 Battery Setting

Battery Setting 1/3

Battery mode 1

Lithium

Pb-Acid

Bat(V)

No Bat

Max Charge (A) 40

Max Discharge (A) 120

Bat1 Energy(kWh) 40

Bat2 Energy(kWh) 40

Activate Bat01

Parallel Bat01&Bat02

Activate Bat02

Battery Setting 2/3

Grid Charge Battery

Max Power(W) 135.0

Shutdown (%) 10.0

Bat Port port 1

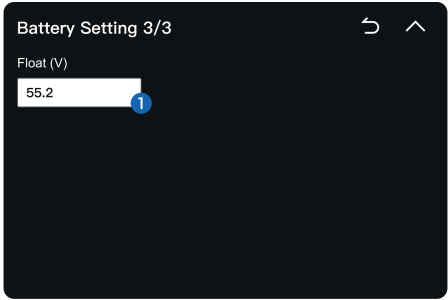
Restart (%) 20.0

Port 1 Num 20.0

Warn (%) 15.0

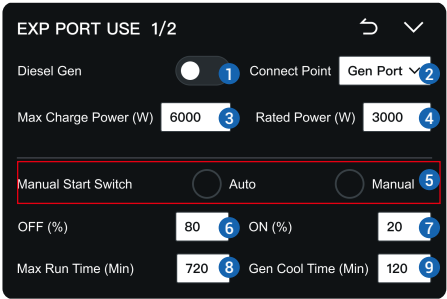
Port 2 Num 15.0

Set Up	Descriptions
①	Type of battery;
②	Max Charge: The maximum charging current allowed by the battery pack. Single-phase maximum 135A, three-phase 50A;
③	Bat1 Energy: Battery capacity at PCS battery port 1
④	Max Discharge: The maximum allowed discharge current for the battery pack is 135A for single-phase and 50A for three-phase;
⑤	Bat2 Energy: Battery capacity at PCS battery port 2
⑥	Activate Bat01: PCS automatically activates the first battery pack switch;
⑦	Activate Bat02: PCS automatically activates the second battery pack switch;
⑧	parallel Bat1&Bat2: Battery 1 and Battery 2 operate in parallel;
⑨	Allow grid charge: 0: Charging batteries is not allowed on the grid 1: Allow the grid to charge the battery
⑩	Max Power(W): The maximum current value for charging batteries using the grid
⑪	Shutdown: It indicates the inverter will shutdown if the SOC below this value.
⑫	Restart: Battery voltage at this value, inverter AC output will resume.
⑬	Warn: It indicates the inverter will alarm if the SOC below this value.
⑭	Bat Port: The battery is actually connected to the PCS battery port
⑮	Port1 Num: Port 1 Battery pack quantity settings
⑯	Port2 Num: Port 2 Battery pack quantity settings



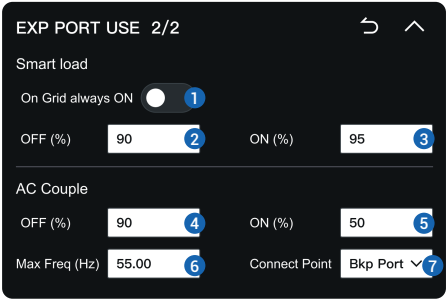
Set Up	Descriptions
①	Battery corresponding float voltage threshold;

7.3.5 GEN PORT USE



Set Up	Descriptions
①	Diesel generator function enable switch;
②	Diesel connection port; NOTE: The correct access location needs to be configured here, otherwise it will affect the system operation.
③	Max Charge Power: Maximum permissible charging power from diesel generators to batteries;
④	The rated power of diesel generator;
⑤	Diesel generator mode: Auto or Manual;
⑥	After the battery reaches this threshold, the diesel generator is stopped via the dry contact;

Set Up	Descriptions
⑦	After the battery reaches this threshold, the diesel generator is activated via the dry contact;
⑧	Diesel generator maximum single operation time
⑨	Forced cooling time for diesel generators;



Set Up	Descriptions
①	When the switch is switched on, the smart load is always connected during grid connection without battery SOC or voltage constraints;
②	After the battery reaches this threshold, the smart load is cut off;
③	After the battery reaches this threshold, the smart load is reconnected;
④	After the battery reaches this threshold, Cut off the AC PV inverter;
⑤	After the battery reaches this threshold, reconnected the AC PV inverter;
⑥	Hybrid Inverter linearly reduces the AC inverter output frequency as it approaches the AC PV inverter disconnect threshold; when the inverter disconnect threshold is reached, the AC inverter output frequency needs to reach this configured frequency value to stop the AC output;
⑦	AC PV inverter access location: backup port, GEN port; NOTE: The correct access location needs to be configured here, otherwise it will affect the system operation.

7.3.6 Grid Setting

Grid Setting 1/3

Grid Code: INVALID Setting 1

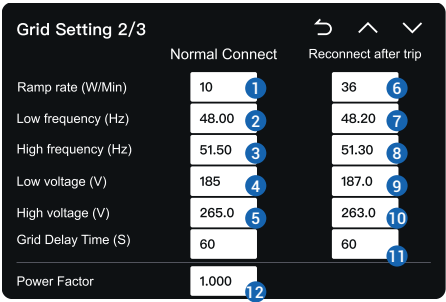
Grid Frequency ②: ☒ 50Hz ☐ 60Hz

Grid Phase Type ③: ☒ ABC ☐ CBA

Three-Phase Unbalance ④: ☒

Grid Level ⑤: LN220V/ LL 380V

Set Up	Descriptions
①	Grid mode: See the safety regulation form for certification maintenance. After the user makes a selection, they need to click SETTING for it to take effect.
②	Grid Frequency;
③	Grid Phase Type;
④	Three-phase unbalance: Is three-phase output imbalance allowed?
⑤	Grid level: When the inverter is off-grid, its output voltage level;



Set Up	Descriptions
①	Grid-connected power slope;
②	Lowest frequency of grid-connected;
③	Highest frequency of grid-connected;
④	Lowest Voltage of grid-connected;
⑤	Highest Voltage of grid-connected;
⑥	Reconnection power slope;
⑦	Lowest frequency of reconnection;
⑧	Highest frequency of reconnection;
⑨	Lowest voltage of reconnection;
⑩	Highest voltage of reconnection;
⑪	Time delay of grid reconnection ;
⑫	PF setting

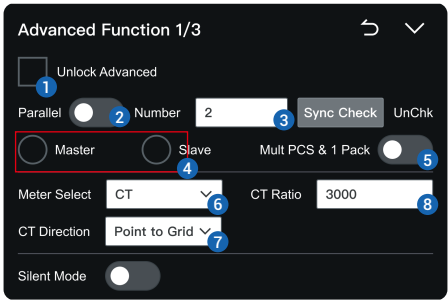
Grid Setting 3/3 ↶ ↷

Over voltage $U > (10 \text{ min. running mean})$ 0.0 ①

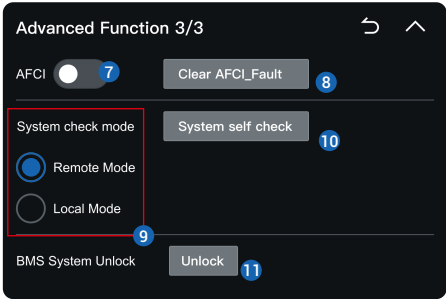
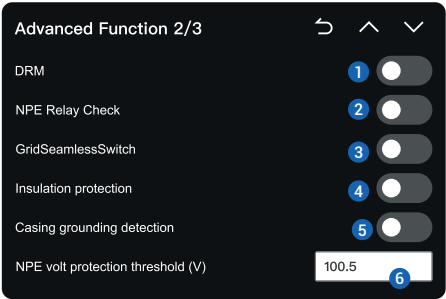
	Volt (V)	Time (S)	Freq (Hz)	Time (S)
HV1	270.0	0.160	HF1 52.50	0.100
HV2	0.0 ②	0.000 ③	HF2 0.00 ④	0.000 ⑤
LV1	180.1	0.160	LF1 47.50	0.100
LV2	0.0 ⑥	0.000 ⑦	LF2 0.00 ⑧	0.000 ⑨

Set Up	Descriptions
①	Grid 10-minute overvoltage threshold;
②	Grid overvoltage threshold levels for levels 1 and level 2;
③	Grid overvoltage detection time or levels 1 and level 2;
④	Grid over frequency threshold levels for levels 1 and level 2;
⑤	Grid over frequency detection time or levels 1 and level 2;
⑥	Grid undervoltage threshold levels for levels 1 and level 2;
⑦	Grid undervoltage detection time or levels 1 and level 2;
⑧	Grid under frequency threshold levels for levels 1 and level 2;
⑨	Grid under frequency detection time or levels 1 and level 2;

7.3.7 Advanced Function

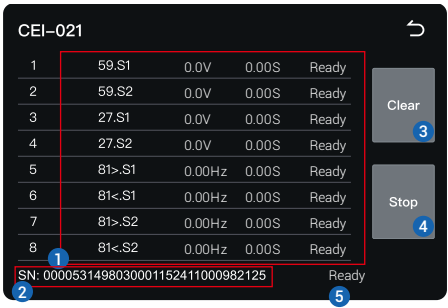


Set Up	Descriptions
①	Unlock advanced parameters configurable with password ; NOTE: Every time you go to the advanced configuration page, you need to select here;
②	Hybrid Inverter parallel switch, to be selected when the system is connected in parallel;
③	Number of parallel inverters;
④	Hybrid Inverter parallel master-slave configuration;
⑤	Muti Inverter&1 PACK.
⑥	Feedback source selection;
⑦	Meter CT orientation: CT installation direction towards the grid;
⑧	CT Ratio.



Set Up	Descriptions
①	DRM enable
②	NPE Relay Check
③	GridSeamlessSwitch
④	Insulation protection enable
⑤	Casing grounding detection
⑥	NPE Voltage protection threshold
⑦	AFCI enable
⑧	AFCI fault clearance
⑨	System self-check mode Remote mode: 6 Local Mode: 8
⑩	Click this button to jump to the system self-check page.
⑪	BMS system lock and unlock.

7.3.7.1 System Self-test Information (For Italy Only)

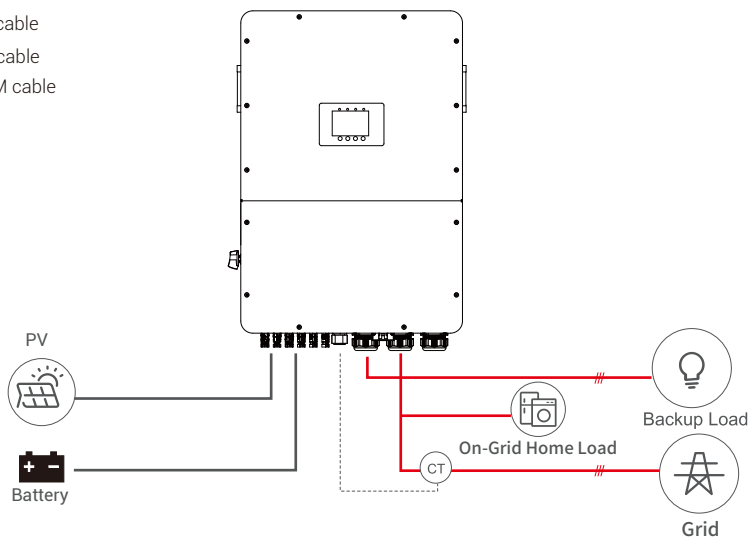


Set Up	Descriptions
①	System self-check result;
②	SN code;
③	Clear self-test data;
④	Pause process: Pause the self-test process with this button;
⑤	Self-inspection results (total);

7.4 Operation Mode

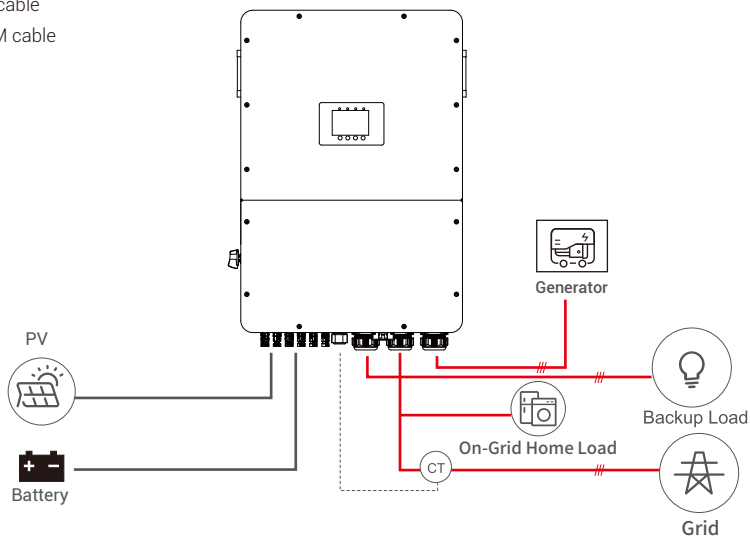
Mode I : Basic Mode

- AC cable
- DC cable
- COM cable



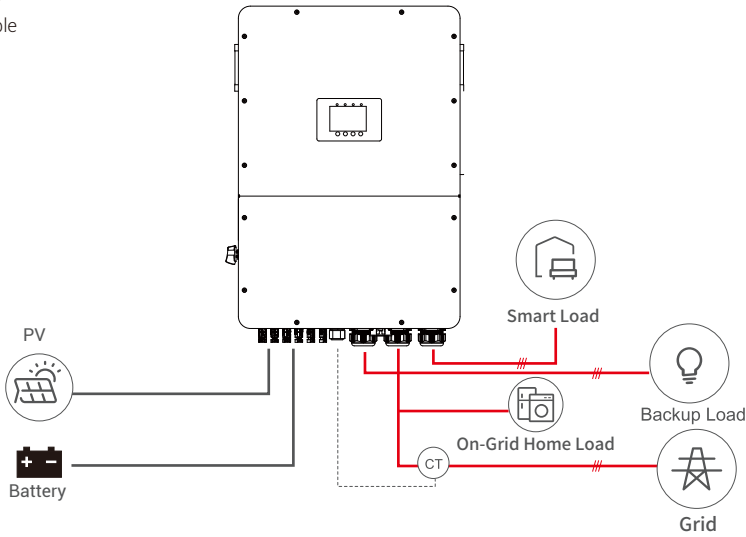
Mode II :Gen Mode

- AC cable
- DC cable
- COM cable



Mode III: With Smart-Load

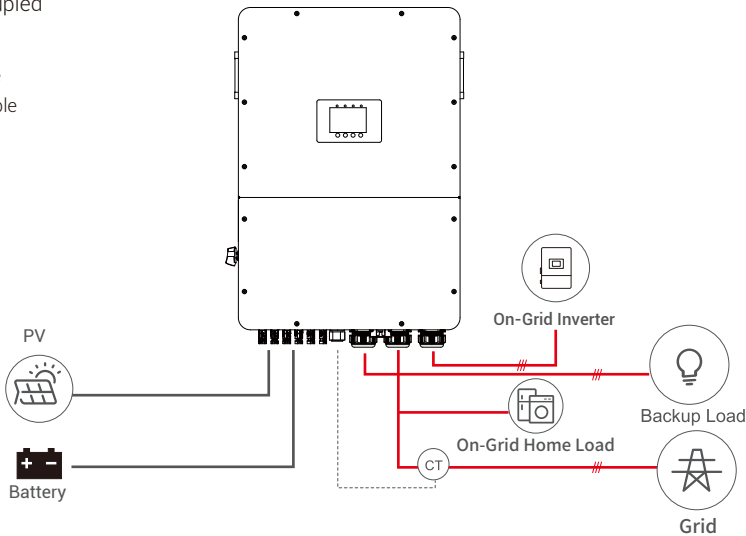
- AC cable
- DC cable
- COM cable



Mode IV: AC Couple

Gen + AC coupled

- AC cable
- DC cable
- COM cable

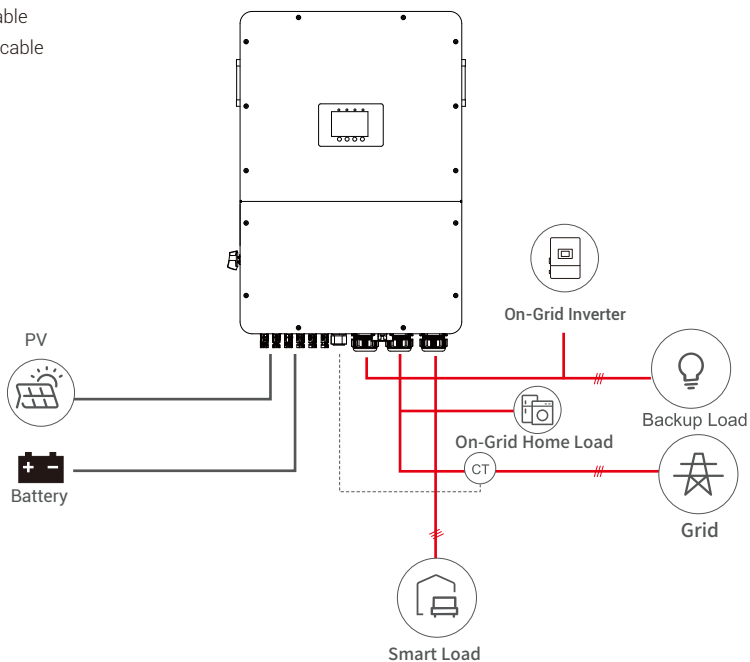


Load + AC couple

— AC cable

— DC cable

- - - - - COM cable



Notice

1. PV power is always the primary power source of the system, followed by the battery pack or the grid.
2. If the generator functions properly, it will serve as the final backup power source.

8 System Commissioning

8.1 Introduction of Hybrid Inverter Parameters

Parameter Name	Clarification
DC Voltage	Inverter PV side DC input voltage
DC Current	Inverter PV side DC input current
Grid Voltage	Grid voltage in the current region
Output Current	Grid-side AC current at the output of the inverter
Grid Frequency	Grid Frequency of the current region
Power Generate	Current real-time output power displayed by the inverter
Date/Time	Standard time of the current country/region
Daily Generate	Total power output of the system in a day
Total Generating	Cumulative sum of power output after system installation
SN	A series code used to uniquely identify the inverter, located on the side nameplate of the product
Firmware Version	Version number combined from communication software version number and control software version number
WiFi Module Software Version (optional)	WiFi module software version number (optional)
Setting Up Safety Regulations	The parameters are set according to the mandatory grid regulations of the country/region where the inverter is located, as well as the actual application scenario of the inverter
Setting the Date	Setting according to the actual time in the country where the inverter is located
Power Factor Setting	Set the power factor value of the inverter output according to the actual need
Setting the Modbus Address	Setting according to the Modbus address of the actual inverter connection
ISO Setting	Set the insulation impedance threshold of the DC bus to PE on the PV input side, and when the detection value is lower than the set value When the detection value is lower than the set value, an ISO fault will be alerted
Shadow Scan	If the PV module is shaded, it can be used to increase power generation by switching on the shadow scanning function
Shadow Scan Period	Set the shadow scanning interval according to the actual scene
Shadow Time	Set the shadow scanning time according to the actual need
Warning List	View current and historical alarm information for the inverter

8.2 Setting the Hybrid Inverter Parameters Via the App

HiEco APP is a mobile phone application that can communicate with the inverter via 4G/WIFI/Bluetooth (optional). Common functions are as follows:

1. Check the basic information of the power station system, inverter operation data, software version, alarm and fault information, etc;
2. Set the safety parameters, functional parameters and communication parameters of the inverter, etc;
3. Provide operation and maintenance support information.

Scan the following QR code to download the APP:



Scan the following QR code for commissioning process:



Scan the QR code to download
the app for debugging

9 System Maintenance

9.1 Hybrid Inverter Power Off



Danger!

1. When the inverter is operated, the inverter should be disconnected from the power supply first, as the operation with power supply will easily lead to equipment failure or risk of electric shock;
2. After the inverter is disconnected from the power supply, the internal devices need to be discharged for a certain period of time, so you need to wait until the end of the discharge according to the labelled time.

Step 1: (Optional) Remotely send a shutdown command to the inverter;

Step 2: The battery button switch is disconnected, turning off the built-in switch of the battery, and disconnect the GEN source;

Step 3: Disconnect the AC protection switch on the inverter's AC output side;

Step 4: Disconnect the DC isolating switch of the inverter.

9.2 Removal the Hybrid Inverter



Warning!

1. Make sure the inverter is in power-off state;
2. When operating, please wear professional protective samples, such as safety shoes, safety helmets, insulated gloves, etc.

Step 1: Disconnect all electrical connections of the inverter, including: DC cables, AC cables, signal cables, communication modules, and enclosure protective ground wires, in case the inverter power-down operation is completed;

Step 2: Removal personnel holding the inverter handle or lifting, remove the inverter from the back mounting plate;

Step 3: Remove the inverter back mounting plate;

Step 4: Properly store the inverter.

9.3 Disposal of the Hybrid Inverter

When the inverter is to be scrapped, please dispose of it according to the relevant electrical equipment waste disposal requirements of the regulations of your country/region, and do not dispose of the inverter as household waste to avoid polluting the environment.

9.4 Routine Maintenance

Maintenance Content	Maintenance Methods	Maintenance Cycle
System Cleaning	Check the radiator inlet and outlet vents for foreign objects and remove them	Once per half year
DC Switch	The DC disconnect switch opens and closes 10 times consecutively and functions normally	Once per year
Electrical Connection	Check that the cable connections are secure and that the outer insulation is not broken	Once per half year
Fan	Check that the fan is running properly and that there are no strange noises	Once per year
Sealing	Check whether the sealing of the external interface of the inverter meets the requirements, if there is a gap or unsealed, need to be dealt with	Once per year

9.4.1 Maintenance Before Operation

1. Before the inverter is put into operation, read the instruction manual carefully, and strictly execute the connection and installation of the equipment according to the instructions on the manual.
2. Carefully check whether the various parts of the inverter as well as the terminals are loose and fall off in the process of transporting.
3. Carefully check whether the diameter of each wire of the inverter is in accordance with the requirements; whether the insulating property is good or not; and whether the grounding of the system is in accordance with insulation regulations or not. Note: When using the inverter, it should be operated in strict accordance with the instructions for using and maintaining the inverter, and the warning signs on the inverter should be intact. Maintenance of inverter during operation.

9.4.2 Maintenance During Operation

1. In the process of inverter commissioning, regularly check whether the inverter wirings are firm, and check whether the dust net, fan, power module, terminals and other parts are working normally.
2. The inverter cabinet has high pressure, usually should pay attention to check whether the cabinet door is locked or not.
3. When the room temperature exceeds 30℃, effective cooling measures should be taken to prevent the inverter from overheating and burning.
4. The structure and electrical connection of the inverter should be kept intact, and there should be no corrosion, accumulation of dust, etc. The inverter should not have large vibration and abnormal noise during operation.
5. Regularly disconnect the circuit breaker of AC output side of the inverter once.
6. When the DC bus capacitor temperature in the inverter is too high or exceeds the service life, it should be found and replaced in time.
7. the inverter belongs to high reliable operation equipment, can achieve long-term trouble-free operation, weekdays should carry out inspections, listen to the inverter sound is normal, the external debris, whether the vent is dusty, the panel display is normal, found that the problem is dealt with in a timely manner, report.

Note: Non-professionals should not disassemble and overhaul the inverter without permission. Inverter generally have short circuit, over current, over voltage, overheating and other items of automatic protection, when the problem occurs, do not need to manually shut down.

9.5 Fault Information

a. Grid Side

Code	Fault Name	Solution
E100	No AC Connection	1. Alarm disappears automatically when power supply is restored to the network; 2. Check whether the AC line or AC switch is disconnected.
E101	Grid voltage abnormal	1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it occurs frequently, please check whether the grid voltage is within the permitted range, if not, please contact the local power operator. If not, please contact the local power operator. If yes, you need to modify the grid voltage protection point with the consent of the local power operator; 3. If recovery is not possible for a long time, please check whether the AC side circuit breaker and the output cable are connected properly.
E102	Grid frequency abnormal	1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it occurs frequently, please check whether the grid frequency is within the permitted range, if not, please contact the local power operator. If not, please contact the local power operator. If yes, you need to modify the grid frequency protection point with the consent of the local power operator.
E103	Grid phase sequence is error	1. Confirm that the three-phase phase sequence is in reverse order; 2. Operate the mobile phone APP to set the phase sequence to reverse sequence.
E104	Output DCI over-range	1. If the abnormality is introduced by an external fault, the inverter automatically resumes normal operation after the fault disappears, no manual intervention is required; 2. If the alarm occurs frequently and affects the normal power generation of the power station, please contact the dealer /Our customer service center.
E105	Anti-backflow over-limit fault	1. Switch off the load, check that the wiring is connected and verify that the load does not exceed the requirements of the specification. If the wiring is not connected, check the wiring and reconnect it; 2. If the load exceeds the requirements of the specification, reduce the load; 3. If the wiring is intact and the load does not exceed the specification, and the fault persists, please contact your dealer / our customer service center.
E106	Meter or CT abnormal	1. Please check whether the CT installation direction is correct; 2. Check if the CT is installed in the correct phase; 3. Please check whether the cable from CT to equipment is disconnected.
E107	Meter or CT reverse connection	1. Check whether the wiring of CT is normal.
E108	Grid Other abnormalities	1. if it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is needed; 2. if it occurs frequently, please check whether the power grid is within the allowable range, if not, please contact dealer / our customer service center.

b. Back Up Side

Code	Fault Name	Solution
E200	The off-grid output voltage is too high	Check the settings of the inverter to ensure that its output voltage is set in the correct range, try increasing the load or adjusting the load distribution.
E201	The off-grid output voltage is too low	Insufficient energy on the PV side and the battery, resulting in a low inverter voltage, waiting for the PV to charge the battery or for the grid to reopen in grid-connected mode.
E202	Off-grid output overload	Reduce the number of loads on the BACK-UP side of the inverter to ensure that the load power is not greater than the maximum BACK-UP output power.

c. PV

Code	Fault Name	Solution
E300	PV input overvoltage	Check the series configuration of the corresponding PV array string to ensure that the open circuit voltage of the string is not higher than the maximum working voltage of the inverter. The inverter alarm disappears automatically after the PV array is correctly configured.
E301	PV string reverse connection	Check that the group string is not reversed
E302	PV overload	Disconnect the AC output side switch and DC input side switch, close the AC output side switch and DC input side switch after 5 minutes, if the fault still exists, please contact the distributor/our customer service center.
E303	AFCI fault	- Five failures in one day will be automatically recovered, no need to pay attention to; if you need to recover immediately, you can clear the faults manually; - Check whether the CT connection on the AFCI veneer is normal; - If the arc pulling fault occurs frequently, please contact the distributor/our customer service center;
E304	Residual current High	- If it occurs by chance, it may be caused by accidental abnormality of external wiring, and the fault will be cleared and normal operation will be resumed. After the fault is cleared, it will resume normal operation without manual intervention. - If it occurs frequently or cannot be recovered for a long time, please check whether the impedance of PV string to ground is too low or not. Is it too low.
E305	PV Isolation Low	- Check the impedance of the PV string to the protective earth, if there is a short circuit, rectify the short circuit point. - Check whether the protective earth wire of the inverter is correctly connected. - If it is confirmed that the impedance is lower than the default value under rainy weather conditions, please reset the "insulation impedance protection point".

d. Battery

Code	Fault Name	Solution
E400	Battery BMS fault	1. Restart the machine and observe whether the alarm still exists; 2. Please contact the distributor/our customer service center to arrange operation and maintenance personnel to investigate the problem on site.
E401	Battery BMS running abnormal	1. Restart the machine and observe whether the alarm still exists; 2. Please contact the distributor/our customer service center to arrange for on-site troubleshooting of the operation and maintenance personnel to investigate the problem.
E402	Battery BMS communication abnormal	1. Restart the machine and observe whether the alarm still exists; 2. Please contact the distributor/our customer service center to arrange for on-site troubleshooting of the operation and maintenance personnel to investigate the problem.
E403	Battery DCDC fault	1. Restart the machine and observe whether the alarm still exists; 2. Please contact the distributor/our customer service center to arrange operation and maintenance personnel to investigate the problem on site.
E404	Battery DCDC run abnormal	1. Restart the machine and observe whether the alarm still exists; 2. Please contact the distributor/our customer service center to arrange operation and maintenance personnel to investigate the problem on site.
E405	Battery output overload	1. If it occurs occasionally, it may be a short time overload, it will resume normal work automatically, without manual intervention; 2. If it occurs frequently, please reduce the load; 3. If the load has not exceeded the regulations, the fault still exists, please contact the dealer/our company's customer Service Centre.
E406	Battery overvoltage	No manual intervention is required, and the total battery voltage can be automatically recovered after discharge or resting below the fault recovery threshold.
E407	Battery undervoltage	1. After charging or resting the total battery pressure is higher than the fault recovery threshold can be automatically restored; 2. If it is not restored for a long time, the total battery pressure continues to drop, and it is necessary to force electricity.
E408	Battery SOC is low	Charging for the battery.
E409	Battery Over-temperature protection	1. No manual intervention is required, wait for the temperature to drop and recover automatically; 2. If the fault can not be recovered, manual on-site confirmation of the state of the battery cell is required, according to the state of the battery cell to decide to clear the system lock faults and then restart or replace the battery.
E410	Battery Low-temperature protection	No need for manual intervention, wait for the temperature to rise and resume automatically.

e. Gen

Code	Fault Name	Solution
E500	Oil machine overload	1. stop the oil machine operation, check whether the line is connected, if the line is not connected, check the line and reconnect it; 2. Check whether the output voltage, current, power and other parameters of the off-grid side are out of the parameter range, if so, reset the parameters according to the requirements; 3. If the line is intact and the parameter setting is not out of regulation, and the fault still exists, please contact the dealer / our customer service center.
E501	Oil machine fault	1. Restart the machine and oiler and observe whether the fault still exists; 2. Please contact the dealer/our customer service center to arrange operation and maintenance personnel to troubleshoot the problem on site.

f. System

Code	Fault Name	Solution
E600	Internal communication fault	1. Restart the machine and observe whether the fault still exists; 2. Please contact the distributor / our customer service center to arrange for on-site troubleshooting by the operation and maintenance.
E601	Hybrid Inverter is running abnormally	1. Restart the machine and observe whether the fault still exists; 2. Please contact the distributor / our customer service center to arrange the operation and maintenance personnel to investigate the problem on site
E602	Hybrid Inverter fault	1. Restart the machine and observe whether the fault still exists; 2. Please contact the distributor / our customer service center to arrange the operation and maintenance personnel to investigate the problem on site.
E603	OTA upgrade failure	1. Check that the OTA upgrade package is correct; 2. Re-try the OTA; 3. If the upgrade keeps failing, please contact your dealer / our customer service center.
E604	Over-temperature protection	1. Check whether the ventilation of the inverter installation location is good and whether the ambient temperature is beyond the maximum permissible ambient temperature range. 2. If there is no ventilation or the ambient temperature is too high, please improve the ventilation and heat dissipation. 3. If the ventilation and ambient temperature are normal, please contact your dealer/our customer service centre.
E605	Fan abnormal	Disconnect the AC output side switch and DC input side switch, close the AC output side switch and DC input side switch after 5 minutes, if the fault still exists, please contact your dealer/our customer service center.
E606	Parallel machine abnormal	1. Check if the communication line is not in good contact, the fault will disappear automatically after normal wiring, no need for manual intervention; 2. If the alarm keeps appearing, please contact your dealer/our customer service center.

10 Technical Parameters

Technical Data	MH-HYIV15.0-TH -S4	MH-HYIV20.0-TH	MH-HYIV25.0-TH	MH-HYIV29.9-TH	MH-HYIV30.0-TH
PV Input					
Max. input power [W]	30000	40000	50000	59800	60000
Max. input voltage [V]	1000				
Rated input voltage [V]	650				
MPPT voltage range [V]	160-850				
Startup voltage [V]	180				
Max. input current per MPPT [A]	36/36		36/36/36		
Max. short circuit current per MPPT [A]	45/45		45/45/45		
Number of MPPTs	2		3		
Max. number of PV strings per MPPT	2/2		2/2/2		
lthe solar 40 C	36/36 d.c.A				
lthe solar 60 C	24.6/24.6 d.c.A				
Max. backfeed current to the PV array [A]	0				
Battery Data					
Battery type	Li-Ion				
Max. charge/discharge power [W]	16500	22000	27500	30000	33000
Battery voltage range [V]	160-750				
Max. charge/discharge current [A]	50/50		50*2/50*2		
AC Grid Side (On-grid)					
Rated output power [W]	15000	20000	25000	29900	30000
Max. output power [W]	16500	22000	27500	29900	33000
Rated output apparent power [VA]	15000	20000	25000	29900	30000
Max. output apparent power [VA]	16500	22000	27500	29900	33000
Rated input apparent power from grid [VA]	15000	20000	25000	29900	30000
Max. input apparent power from grid [VA]	30000	40000	50000	60000	60000
Rated grid voltage [V]	3L/N/PE, 220 V / 380 V, 230 V / 400 V				
Rated grid frequency [Hz]	50/60				
Max. output current [A]	25/24	33.4/31.9	41.7/39.9	45.4/43.4	50/47.9
Rated output current [A]	22.8/21.8	30.4/29	37.9/36.3	45.4/43.4	45.4/43.5
Rated input current from grid [A]	22.8/21.8	30.4/29	37.9/36.3	45.4/43.4	45.4/43.5
Max. input current from grid [A]	45.5/43.3	60.6/57.7	76.0/72.2	90/86.6	90/86.6
Power factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
I.THD [%]	<3@Rated power				

Technical Data	MH-HYIV15.0-TH-S4	MH-HYIV20.0-TH	MH-HYIV25.0-TH	MH-HYIV29.9-TH	MH-HYIV30.0-TH
AC Current (inrush)[A]	115A@5us				
Maximum output fault current [A]	105A@5us				
Maximum output overcurrent protection[A]	35	47.2	59	64	71
Backup Port					
Rated apparent power [VA]	15000	20000	25000	29900	30000
Max. apparent power [VA]	16500	22000	27500	29900	33000
Nominal output voltage [V]	3L/N/PE, 230 V / 400 V				
Rated output frequency [Hz]	50/60				
Max. output current [A]	25	33.4	41.7	45.4	43.5
Output V. THD [%]	<3@Linear Load				
GEN Port (AC)					
Nominal output voltage [V]	3L/N/PE, 230 V / 400 V				
Nominal frequency [Hz]	50/60				
Max. input apparent power [VA]	30000	40000	50000	50000	50000
Max. input current [A]	43.3	57.7	72.2	72.2	72.2
Power factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
Efficiency					
MPPT efficiency [%]	99.9%				
Euro efficiency [%]	96.7%	97.2%			
Max. efficiency [%]	97.8%				
Max. Battery charge / discharge efficiency [%]	98.5%(PV-BAT) 96.7%(BAT-AC)	98.5%(PV-BAT) 97.2%(BAT-AC)			
Protection					
LVRT	YES				
HVRT	YES				
Anti-islanding protection	YES				
AC output overvoltage / undervoltage protection	YES				
AC short circuit protection	YES				
AC overcurrent protection	YES				
Leakage current protection	YES				
DC surge protection	YES				
AC surge protection	YES				
PV insulation resistance detection	YES				
PV reverse polarity protection	YES				
PV input overvoltage protection	YES				

Technical Data	MH-HYIV15.0-TH -S4	MH-HYIV20.0-TH	MH-HYIV25.0-TH	MH-HYIV29.9-TH	MH-HYIV30.0-TH
Battery reverse polarity protection			YES		
Earthing fault protection			YES		
DC arcing detection and protection			YES		
System Data					
Ingress protection			IP66		
Protection class			Class I		
Pollution degree			PD3		
Overvoltage category			III (MAINS), II (DC)		
Operating temperature range [°C]			-25~+60		
Max. operation altitude [m]			3000		
Relative humidity			0 ~ 100%		
Cooling method			Smart fan cooling		
User interface			LED, LCD, APP		
Communication with BMS			CAN		
Communication with meter			RS485		
Communication with portal			WiFi (optional)		
Typical noise emission [dB]	<55			<60	
Dimension (W*H*D) [mm]			550*800*230		
Weight [kg]	46.5±2			50±2	
Topology			Non-isolated		
Self-consumption [W]			<25		
PV connector			MC4		
AC connector			Terminal Block		
Battery connector			Terminal Block		
Storage temperature [°C]			-40~+70		
Standard warranty [years]			5/10		
Standard Compliance					
Safety			IEC/EN 62109-1&-2		
EMC			EN IEC 61000-6-1/-2/-3/-4, IEC/EN 62920		
Grid code			VDE-AR-N 4105, EN50549-1&-10, CEI 0-21		

Technical Data	MH-HY- IV15.0-TH-S4-AU	MH-HY- IV20.0-TH-AU	MH-HY- IV25.0-TH-AU	MH-HY- IV29.9-TH-AU	MH-HY- IV30.0-TH-AU
PV Input					
Max. input power [W]	30000	40000	50000	59800	60000
Max. input voltage [V]	1000				
Rated input voltage [V]	650				
MPPT voltage range [V]	160-850				
Startup voltage [V]	180				
Max. input current per MPPT [A]	36/36		36/36/36		
Max. short circuit current per MPPT [A]	45/45		45/45/45		
Number of MPPTs	2		3		
Max. number of PV strings per MPPT	2/2		2/2/2		
I _{the solar} 40 °C	36/36 d.c.A				
I _{the solar} 60 °C	24.6/24.6 d.c.A				
Max. backfeed current to the PV array [A]	0				
Battery Data					
Battery type	Li-Ion				
Max. charge/discharge power [W]	16500	22000	27500	30000	33000
Battery voltage range [V]	160-750				
Max. charge/discharge current [A]	50/50		50*2/50*2		
AC Grid Side (On-grid)					
Rated output power [W]	15000	20000	25000	29900	30000
Max. output power [W]	15000	20000	25000	29900	30000
Rated output apparent power [VA]	15000	20000	25000	29900	30000
Max. output apparent power [VA]	15000	20000	25000	29900	30000
Rated input apparent power from grid [VA]	15000	20000	25000	29900	30000
Max. input apparent power from grid [VA]	30000	40000	50000	60000	60000
Rated grid voltage [V]	3L/N/PE, 220 V / 380 V, 230 V / 400 V				
Rated grid frequency [Hz]	50/60				
Max. output current [A]	25/24	33.4/31.9	41.7/39.9	45.4/43.4	50/47.9
Rated output current [A]	22.8/21.8	30.4/29	37.9/36.3	45.4/43.4	45.4/43.5
Rated input current from grid [A]	22.8/21.8	30.4/29	37.9/36.3	45.4/43.4	45.4/43.5
Max. input current from grid [A]	45.5/43.3	60.6/57.7	76.0/72.2	90/86.6	90/86.6
Power factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
I ₁ THD [%]	<3@Rated power				

Technical Data	MH-HY- IV15.0-TH-S4-AU	MH-HY- IV20.0-TH-AU	MH-HY- IV25.0-TH-AU	MH-HY- IV29.9-TH-AU	MH-HY- IV30.0-TH-AU
AC Current (inrush)[A]	115A@5us				
Maximum output fault current [A]	105A@5us				
Maximum output overcurrent protection[A]	35	47.2	59	64	71
Backup Port					
Rated apparent power [VA]	15000	20000	25000	29900	30000
Max. apparent power [VA]	15000	20000	25000	29900	30000
Nominal output voltage [V]	3L/N/PE, 230 V / 400 V				
Rated output frequency [Hz]	50/60				
Max. output current [A]	25	33.4	41.7	45.4	43.5
Output V. THD [%]	<3@Linear Load				
GEN Port (AC)					
Nominal output voltage [V]	3L/N/PE, 230 V / 400 V				
Nominal frequency [Hz]	50/60				
Max. input apparent power [VA]	30000	40000	50000	50000	50000
Max. input current [A]	43.3	57.7	72.2	72.2	72.2
Power factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)				
Efficiency					
MPPT efficiency [%]	99.9%				
Euro efficiency [%]	96.7%	97.2%			
Max. efficiency [%]	97.8%				
Max. Battery charge / discharge efficiency [%]	98.5%(PV-BAT) 96.7%(BAT-AC)	98.5%(PV-BAT) 97.2%(BAT-AC)			
Protection					
LVRT	YES				
HVRT	YES				
Anti-islanding protection	YES				
AC output overvoltage / undervoltage protection	YES				
AC short circuit protection	YES				
AC overcurrent protection	YES				
Leakage current protection	YES				
DC surge protection	YES				
AC surge protection	YES				
PV insulation resistance detection	YES				
PV reverse polarity protection	YES				
PV input overvoltage protection	YES				

Technical Data	MH-HY- IV15.0-TH-S4-AU	MH-HY- IV20.0-TH-AU	MH-HY- IV25.0-TH-AU	MH-HY- IV29.9-TH-AU	MH-HY- IV30.0-TH-AU
Battery reverse polarity protection			YES		
Earthing fault protection			YES		
DC arcing detection and protection			YES		
System Data					
Ingress protection			IP66		
Protection class			Class I		
Pollution degree			PD3		
Overvoltage category			III (MAINS), II (DC)		
Operating temperature range [°C]			-25~+60		
Max. operation altitude [m]			3000		
Relative humidity			0 ~ 100%		
Cooling method			Smart fan cooling		
User interface			LED, LCD, APP		
Communication with BMS			CAN		
Communication with meter			RS485		
Communication with portal			WiFi (optional)		
Typical noise emission [dB]	<55			<60	
Dimension (W*H*D) [mm]			550*800*230		
Weight [kg]	46.5±2			50±2	
Topology			Non-isolated		
Self-consumption [W]			<25		
PV connector			MC4		
AC connector			Terminal Block		
Battery connector			Terminal Block		
Storage temperature [°C]			-40~+70		
Standard warranty [years]			10		
Standard Compliance					
Safety			IEC/EN 62109-1&-2		
EMC			EN IEC 61000-6-1/-2/-3/-4, IEC/EN 62920		
Grid code			AS/NZS4777.2		



Hiconics Eco-energy Drive Technology Co.,Ltd.

No.3 Boxing 2nd Road, Economic and Technological Development Zone,
100176, Beijing, P.R. China

European Services: Email: solar_service_eu@midea.com

Australian Services: Tel: +61 1300 457 098 Email: solar_service_au@midea.com

Global: Email: solar_service@midea.com

Web: www.hiconics-global.com