Hybrid Solar Inverter

User Manual

For three phase inverter

Thank you for purchasing our product.
Before using the unit, please read this manual carefully and keep it for future reference.

DECLARATION

The right to modify the frame dimensions, functionality, technical data, parameters, standards without prior notice are reserved.

The contents of this manual have been checked for accuracy with its described hardware and software. However, the contents of this manual may be subject to appropriate modification as a result of product upgrades, specification changes, and updates of the manual, we cannot guarantee full accordance all the time. But the data in this manual are reviewed regularly and any necessary corrections are included in subsequent editions. Suggestions for improvement from readers are appreciated.

IMPORTANT NOTES

Please assure the intactness of product enclosure and all safety covers before installation. Operation must conform to the requirements of this manual and local industrial safety regulations and/or electrical codes.

In the event of damage or loss of user manual, users may ask local distributors, offices or our Technical Service Department for a new one.

Contents of this manual may be subject to appropriate modification as a result of product upgrades, specification changes and updates of the manual.

If any item as stated in this manual is not clear, please contact our Technical Service Department.

If any anomaly occur after power up or during the operation, it is essential to stop the machine and identify the fault or seek technical services as soon as possible.

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1 Safety Precautions

Safety signs in this manual:

DANGER indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

WARNING indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

CAUTION indicates low-risk potential hazards that, if not avoided, may lead to minor or moderate injury.

NOTE provides valuable tips on the best operation of our products.

1.1 Important Safety Instructions

Danger to life due to a high voltage inside the inverter!

• All work must be performed by a qualified electrician.

• Children and individuals with reduced physical sensory abilities, mental capabilities, or lack of experience and knowledge should not use this equipment unless supervised or instructed.

Danger of burns

• When the product is working, the upper of the enclosure and the enclosure body may become hot.

• During operation, only the touch screen needs to be operated.

Radiation may cause damage to health.

• Do not stay at a place less than 20cm away from the inverter for a long time.

Ground the PV generator.

• Comply with the local requirements for grounding the PV modules and the PV generator.

• It is recommended that generator frames and other conductive surfaces be connected in a manner that ensures continuous conduction and grounding for optimum protection of the system and personnel.

Make sure the input DC voltage is less than the maximum value. Over-voltage may cause permanent damage to the inverter or other losses, which will not be covered by the warranty!

Before attempting any maintenance, cleaning or working on any circuits connected to inverter, authorized service personnel must disconnect both AC and DC power from inverter.

Do not operate the inverter while the equipment is running.

Risk of electric shock!

• It is recommended to use only accessories that are compatible with the inverter, otherwise it may lead to the risk of fire, electric shock or personal injury.

• Make sure the existing wiring is in good condition, and the wires are not undersized.

• Do not disassemble any parts of inverter which are not mentioned in installation guide. It contains no user-serviceable parts. See Warranty for service. Unauthorized repairs may result in a risk of electric shock or fire and will void your warranty, and will void the warranty.

• Keep away from flammable, explosive materials to avoid fire disaster.

• The installation location should be away from humid or corrosive substance.

• Authorized service personnel must use insulated tools when installing or working with this equipment.

• PV modules should have IEC 61730 Class A rating.

• Do not touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both of them at the same time.

• The unit contains capacitors that remain charged to a potentially lethal voltage when the MAINS , battery and PV supply has been disconnected.

• Hazardous voltages may remain present for up to 5 minutes after disconnection.

• CAUTION-The energy stored in the capacitor is a shock hazard, do not operate the inverter, coupler, power cable, battery cable, PV cable or PV generator while energized. After turning off the PV, battery and power supply, always wait 5 minutes to allow the intermediate circuit capacitors to discharge before unplugging the DC, battery and power coupler.

• When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!

• Measure the voltage between terminals UDC+ and UDC- with a multi-meter(impedance at least 1Mohm) to ensure that the device is discharged (<35VDC) before starting to work inside the device.

1.1.1 Install surge protection devices (SPDs) for PV

• Over-voltage protection with surge arresters should be provided when installing PV power generation system.

• The grid connected inverter does not have SPDs installed on both PV input side and MAINS side.

• Lightning will cause a damage either from a direct strike or from surges due to a nearby strike.

• Induced surges are the most likely cause of lightning damage in majority of installations, especially in rural areas where electricity is usually provided by long overhead lines. Surge may be included on both the PV array conduction and the AC cables leading to the building.

• Consult specialists in lightning protection during the end-use application.

• Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.

• Installation of SPDs to protect the inverter against mechanical damage and excessive stress includes a surge arrester in case of a building with external lightning protection system (LPS) when separation distance is maintained.

• To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator. If the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 is required for surge protection for electrical devices.

• To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumer's cutout), located between the inverter and the meter/distribution system; SPD (test impulse D1) for signal in according l to EN 61632-1.

• All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.

• Spark gap devices are not suitable to be used in DC circuits once conducting, they won't stop conducting until the voltage across their terminals is typically more than 30 volts.

1.1.2 Anti-Islanding Effect

The islanding effect is a special phenomenon where a grid-connected PV system still delivers power to the nearby grid when voltage losses occur in the power system. This can be dangerous for maintenance personnel and the public.The Midea series inverters offer Active Frequency Drift (AFD) to prevent the islanding effect.

1.1.3 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 Ifn≤240mA which automatically disconnects the device in case of a fault.The device is intended to connect to a PV generator with a capacitance limit of about 700nf.

High leakage current!

Earth connection essential before connecting supply.

• Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic.

• Make sure that grounding conductor is adequately sized as required by safety regulations.

• Do not connect the ground terminals of the unit in series in case of a multiple installation. This product can cause current with a DC component, Where a residual current operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of type B is allowed on the supply side of this product.

1.1.4 For United Kingdom

• The installation that connects the equipment to the supply terminals shall comply with the requirements of BS 7671.

• Electrical installation of PV system shall comply with requirements of BS 7671 and IEC 60364-7-712.

• 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).

• Make sure that grounding conductor is adequately sized as required by safety regulations.

• Do not connect the ground terminals of the unit in series in case of a multiple installation. This product can cause current with a DC component, Where a residual current operated protective (RCD) .or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of type B is allowed on the supply side of this product.

1.1.5 For Australia and New Zealand

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

1.1.6 Battery Safety Instructions

Midea hybrid Series inverter should be used with low voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 4.

As accumulator batteries may pose risks of electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during 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 the load connected to the batteries before dismantling battery connection terminals.

6: Only individuals with proper expertise can carry out the maintenance of accumulator batteries.

1.2 Important Safety Instructions

This section gives an explanation of all the symbols shown on the inverter and on the type label.

Symbol	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE
	TUV
	RCM remark
	SAA certification
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Please note the provisions of the instruction manual.
	The inverter can't be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate inverter until it is isolated from battery, mains and on-site PV generation suppliers.
	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 min before you open the upper lid or the DC lid.

1.3 CE Directives

This chapter follows the requirements of the European Low Voltage Directive, which contains safety instructions and conditions of acceptance for imported systems that you must follow when installing, operating and servicing the equipment. If ignored, it may result in personal injury or death, or damage to the equipment. Please read this before you perform work on the equipment. If you can not understand these hazards, warnings, cautions, or instructions, contact an authorized service dealer to operate and maintain the equipment prior to installation.

The grid-connected inverter meets the requirements of IEC 62109-1/-2; IEC 62477-1; IEC 61000-6-1/-3.

If installed in a PV system, it is forbidden to start the unit (i.e. to start the specified operation) until it has been established that the entire system complies with the requirements specified in the CE Directive), that the grid-connected inverter is shipped with the connection device completed and ready for connection to the mains and PV power supply, and that the unit is installed in compliance with the national wiring regulations. Compliance with safety regulations depends on proper installation and configuration of the system, including the use of the specified wiring.

The system must be installed only by professional assemblers who are familiar with safety and EMC requirements. It is the responsibility of the assembler to ensure that the final system complies with all relevant laws of the country of use.The individual subassemblies of the system should be interconnected by national/international such as the wiring methods listed in the National Electrical Code (NFPA) Regulation No. 70 or VDE Regulation 0107.

2 Introduction

2.1 Model Description

The model description is as follows (take ME-HT8H as an example):

ME - HT 8 H

① ② ③ ④

ME: Midea Energy series	①
HT: Hybrid Three-phase output	②
8: Output power, 8kW	③
H: Battery high voltage	④

2.2 Basic features

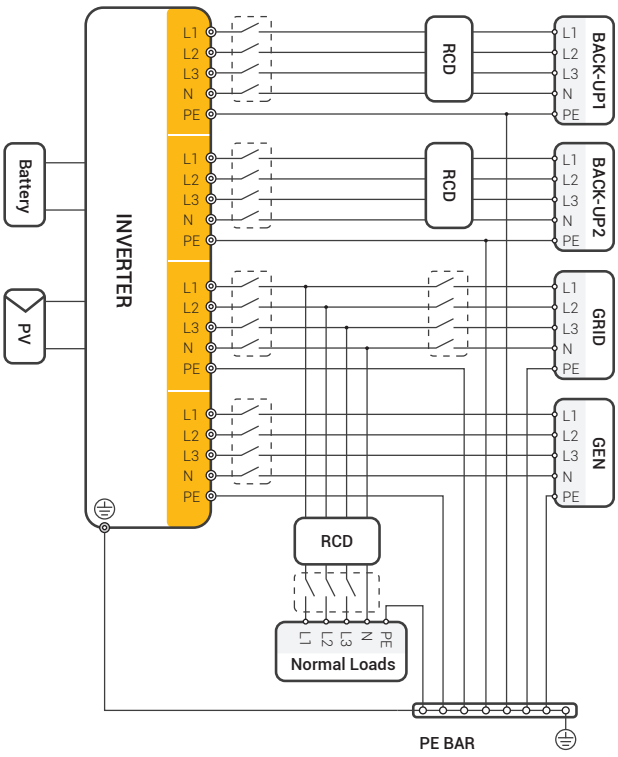
Midea Hybrid Series is a high performance inverter that converts solar energy to DC power and stores the energy in batteries.

The inverter can be used to optimize its own energy consumption, to store energy in batteries for future use or to connect to the public grid. The mode of operation depends on the PV energy source and user preferences. It can use the energy from the batteries and the inverter (generated by the PV) to provide emergency power in case of grid outages.

Midea Hybrid Series is designed in two EPS versions for customers to choose from based on local rules.

E-Version applies to wiring rules that require the N (neutral) wire of the EPS to be disconnected from the N (neutral) wire of the grid (applicable to most countries).

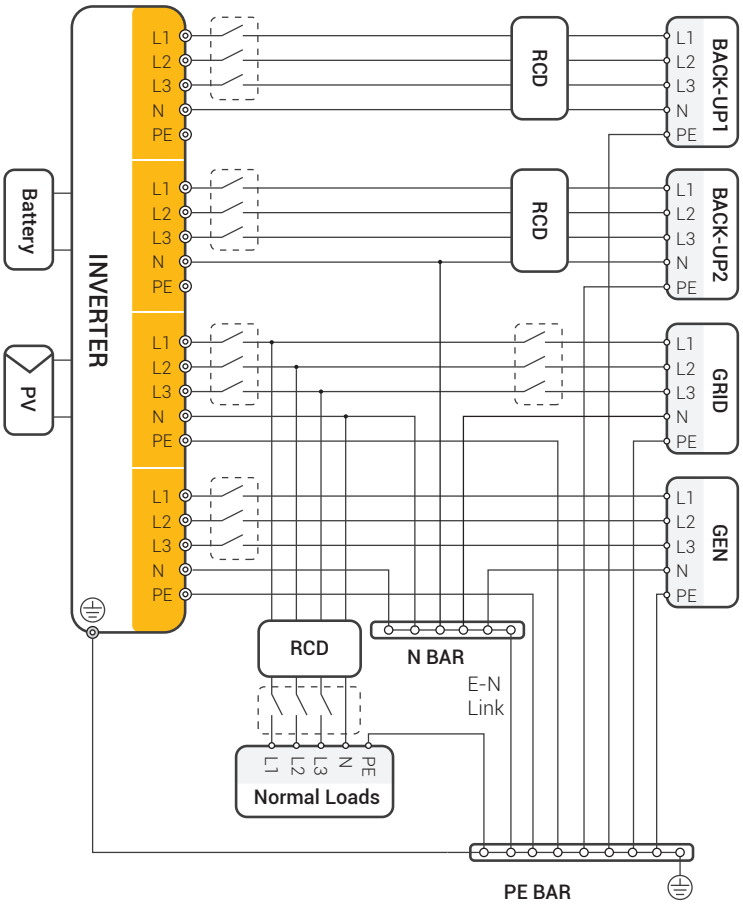
E-Version system diagram



The grounding screw hole of inverter is at the lower right corner.

I-Version applies to wiring rules that require that the N (neutral) wire of other power sources must not be isolated or switched (applicable to Australian and New Zealand wiring rules AS/NZS_3000:2012).

I-Version system diagram



The grounding screw hole of inverter is at the lower right corner.

• Please control the household load and make sure it is within the "EPS output rating" in EPS mode, otherwise the inverter will shut down and issue an "overload fault" warning.

• Please check with the main grid operator for any special grid connection regulations.

• The wiring diagram is for reference only and the complete electrical connection should comply with the local regulations.

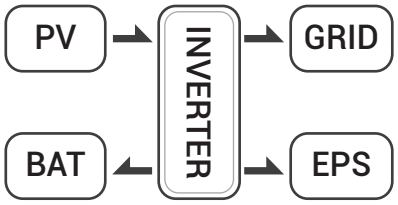
• Do not misconnect the phase sequence. Otherwise, the inverter will not operate properly.

2.3 Work Modes

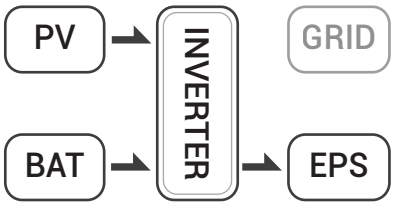
The inverter offers multiple working modes according to different requirements.

Work mode: Self-use

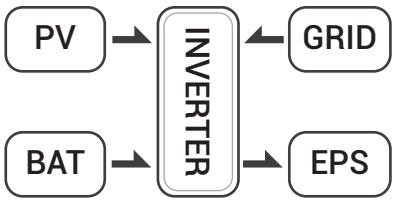
I. When PV, Grid, Battery is available:



Solar energy provides power to the loads as first priority. If solar energy is sufficient to power all connected loads, the excess solar energy will be used to charge the battery, and the reduntant power will be used to feed the grid.

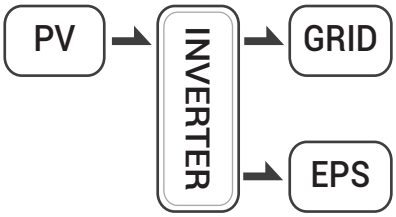


Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.

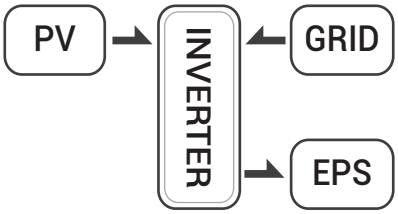


Solar energy provides power to the loads as first priority. If solar energy and battery are not sufficient to power all connected loads, utility energy (Main Grid) will supply power to the loads with solar energy at the same time.

II. When PV, Grid is available(without battery):

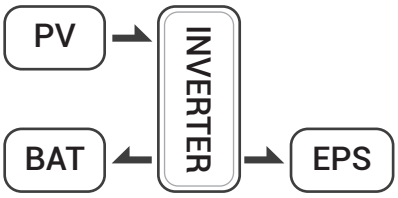


Solar energy provides power to the loads as first priority. If solar energy is Inverter sufficient,the excess power will feed to grid.

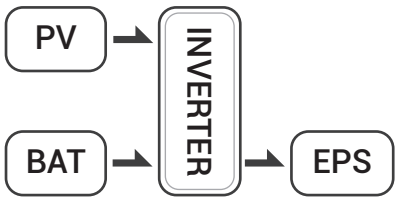


Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, grid energy will supply power to the loads at the same time.

III. When PV, Battery is available (Grid is disconnected):



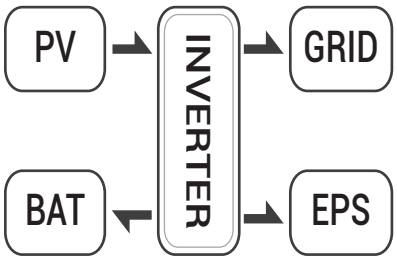
Solar energy provides power to the loads as first priority. If solar energy is sufficient to power all connected loads, solar energy will provides to charge battery.



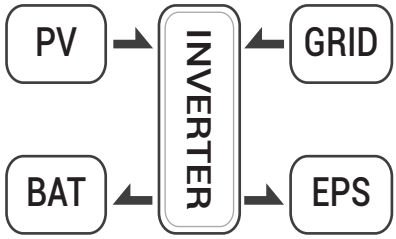
Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy and solar energy will supply power to the loads at the same time.

Work mode: Peak shift

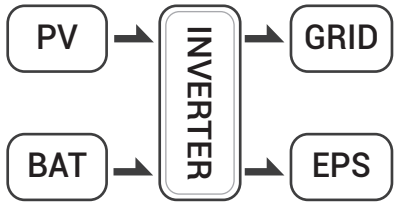
I. When PV, Grid, Battery is available:



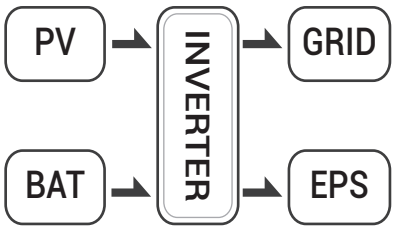
On charge time, solar energy will charge battery as first priority. The excess energy will supply power to the loads.If solar energy is sufficient to supply loads and charge battery.and If there's still some extra energy. then the excess power will feed the power to grid.



On charge time, solar energy will charge battery as first priority. then the excess solar energy will supply power to loads. If solar energy is not sufficient to charge battery and supply loads,grid will supply all the connected loads with solar energy together.

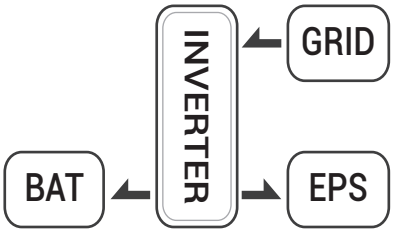


On discharge time, solar energy provides power to the loads as first priority. if solar energy is sufficient to supply loads, and if there's still some extra energy from solar energy,then the excess power and battery will deliver the power to the grid at the same time.

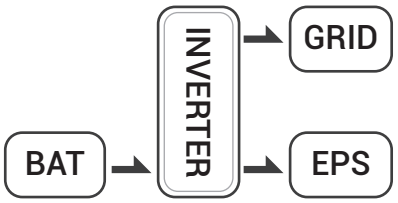


In the period of no charge or discharge, the solar power supply loads at first priority, excess energy to the grid.

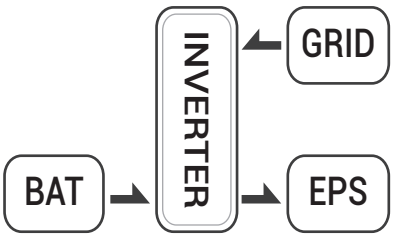
II. When Grid.Battery is available(PV is disconnected):



On charge time, grid will charge battery and supply power to the connected loads at the same time.



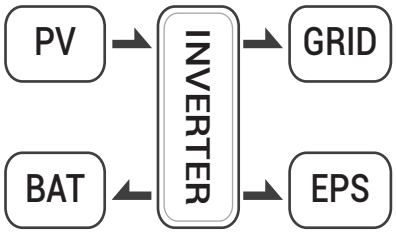
On discharge time,if load power is less than battery power, battery will supply power to loads as first priority. The excess power will be feed to grid.



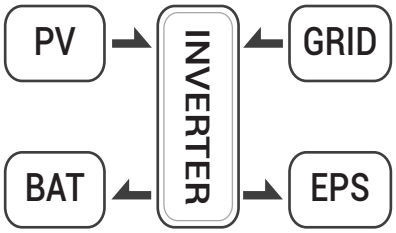
On discharge time,if load power is more than battery power, battery and grid will supply power to the loads at the same time.

Work mode: Bat priority

I. When PV, Grid, Battery is available:

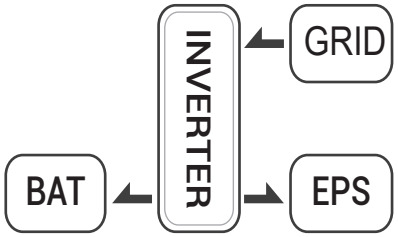


Solar energy will charge battery as first priority. If solar energy is excess. the excess power will supply load. If there's still some extra energy. then the excess power will feed the power to grid.



Solar energy will charge battery as first priority. If solar energy is excess the excess power will supply load. If solar energy is not sufficient to charge battery and supply loads, grid will supply power to loads.

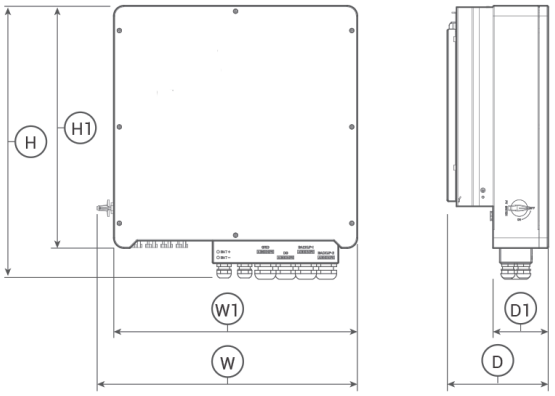
II. When Grid, Battery is available(PV is disconnected):

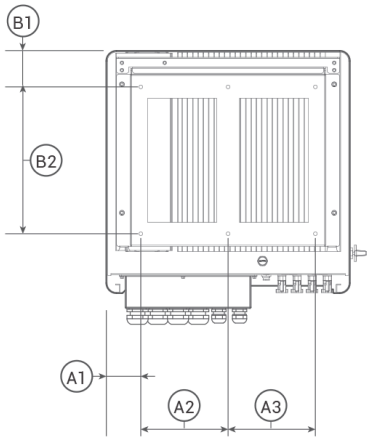


Grid will supply power to load and charge battery at the same time.

• If the anti-reverse function is set to be allowable, the system will not feed power to grid in self-use, peak shift, battery priority modes.

2.4 Dimensions

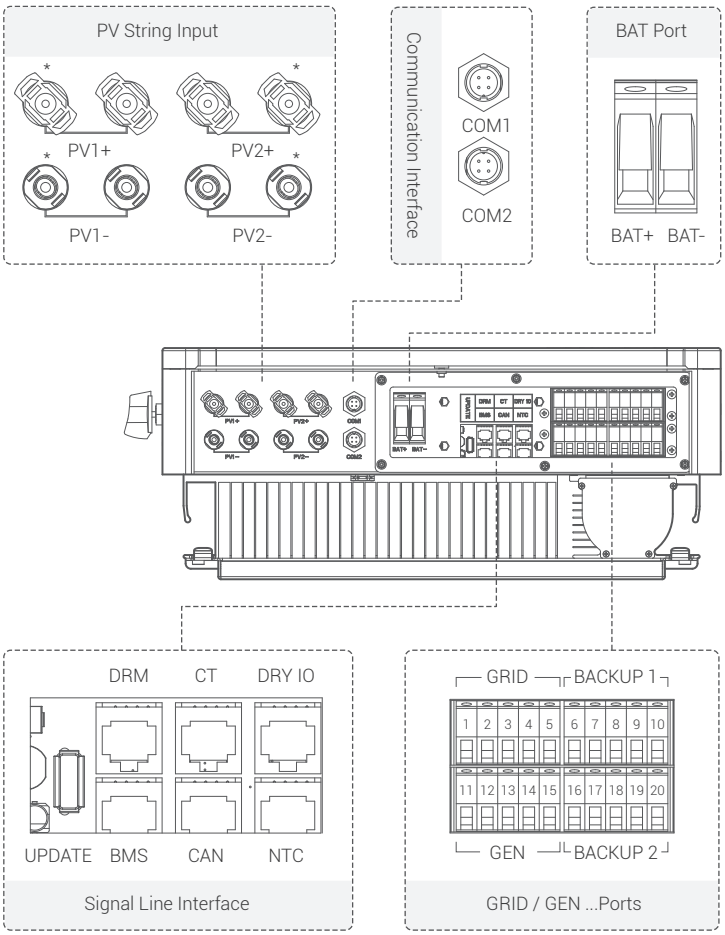




ME-HT6H, ME-HT8H , ME-HT10H , ME-HT12H , ME-HT15H						
W	H	D	W1	H1	D1	Mounting hole dia.
566	596	220	530	528	120	8
A1	A2	A3	B1	B2		
75	190	190	79	320		

Unit, mm

2.5 Terminals



PV1+	PV string 1 positive input
PV1-	PV string 1 negative input
PV2+	PV string 2 positive input
PV2-	PV string 2 negative input
COM1	GPRS port(optional)
COM2	WIFI port (optional)
BAT+	Battery positive input
BAT-	Battery negative input
UPDATE	Port for upgrading software
DRM	Function temporarily retained
CT	Connect to CT (current transformer)
DRY IO	Dry contact
BMS	BMS communication with battery
CAN	CAN communication
NTC	NTC detection

⋆: Only HT15H will use these plugs, which are reserved for other models.

GRID (Diesel generator function is unreleased currently)	
1	Grid line A phase
2	Grid line B phase
3	Grid line C phase
4	Grid line null line
5	Grid line ground electrode
GEN	
6	A phase
7	B phase
8	C phase
9	Null line
10	Ground electrode

Backup 1	
11	Backup1 line A phase
12	Backup1 line B phase
13	Backup1 line C phase
14	Backup1 line null line
15	Backup1 line ground electrode
Backup 2	
16	Backup2 line A phase
17	Backup2 line B phase
18	Backup2 line C phase
19	Backup2 line null line
20	Backup2 line ground electrode

1.The Update port: For on-premises upgrades.

2.The BMS port: BMS communication for lithium batteries.

3.The CT port: For external grid side CT to detect current size.

4.The DRM port, CAN port, NTC port and DRY IO port: Reserved port, temporarily unavailable.

2.6 Parameters

PV input

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Max. power of PV array	9kW	12kW	15kW	18kW	22.5kW
Max. input voltage	1000 V				
MPPT voltage range	180 V~850 V				
Min. input voltage/start voltage	125V/235ZV				
No. of independent MPPT trackers per MPPT input	2				2
No. of independent MPPT strings per MPPT input	1/1				2/2
Max. input current per MPPT tracker	13 A/13A				13A/13A
Max. short-circuit current per MPPT tracker	16A/16A				25A/25A

AC output

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Nominal AC voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
AC voltage range	360V~440V				
Rated AC grid frequency	50 Hz / 60 Hz				
AC grid frequency range	50±5Hz / 60±5Hz				
Rated active power	6 kW	8 kW	10 kW	12 kW	15 kW
Rated apparent power	6kVA	8kVA	10kVA	12kVA	15kVA
Max. apparent power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
Rated grid output current (@400V)	8.7A	11.5A	14.4A	17.3A	21.7 A
Max. grid output current	9.5A	12.7A	15.9A	19.1A	23.8A
Harmonics THDI (@ Nominal power)	< 3%				

AC input

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Rated grid voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
Rated grid frequency	50Hz / 60Hz				
Rated active power	12 kW	16 kW	20 kW	24 kW	30 kW
Max. apparent input power from grid	13.2kVA	17.6kVA	22kVA	26.4kVA	33.3kVA
Rated input current from grid	17.3A	23.1 A	28.9A	34.7A	43.4A
Max. input current from grid	19A	25.5 A	31.9A	38.2 A	47.6A

Battery

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Battery type	Lithium and Lead Acid Battery				
Battery voltage range	125V ~ 600 V				
Max. charging current / Max. discharging current	50 A / 50A				
Rated charging current / Rated discharging current	40A/40A				

Backup output

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Nominal output voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
Rated output frequency	50 Hz / 60 Hz				
Rated active power	6kVA	8kVA	10kVA	12kVA	15kVA
Max. apparent output power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
Peak active output power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
Rated Current (@400V)	8.7A	11.5 A	14.4A	17.3 A	21.7A
Max. output current	9.5A	12.7A	15.9A	19.1A	23.8A
Max. switch time	≤10ms				
Output THDI (@ Linear load)	<2%				

Efficiency

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
MPPT efficiency	≥99.5%				
Max efficiency	97.90%	97.90%	98.20%	98.20%	98.50%
Euro efficiency	97.20%	97.20%	97.50%	97.50%	97.6%
Max. battery to load efficiency	97.50%	97.50%	97.50%	97.60%	97.80%

Safety protection

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
DC-side disconnection device			○		
PV string reverse polarity protection			○		
All-pole sensitive residual current monitoring unit			○		
Anti-islanding protection			○		
AC output over current protection			○		
AC output short circuit current protection			○		
AC over voltage protection			○		
Protection class (as per IEC 62109-1)			I		
Over voltage category (as per IEC 62109-1)			AC: III; DC: II		

General data

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Power factor at rated power / adjustable displacement	0.99 / 0.8 leading to 0.8 lagging				
Dimensions (W / H / D)	530 / 600 / 220 mm				
Device weight	30 kg	31 kg	31kg	33 kg	34 kg
Installation	Wall-mounted				
Operating temperature range	-25 °C~+60 °C				
Noise emissions (typical)	< 35 dB(A)				
Standby consumption	< 20 W				
Cooling method	Natural convection				
Ingress protection rating (as per IEC 60529)	IP65				
Climatic category (according to IEC 60721-3-4)	4K4H				
Max. permissible value for relative humidity (non-condensing)	0~95%				
Max. operating altitude	4000m (>2000m power derating)				

Features

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Inverter topology (PV / battery)	Transformer less / Transformer less				
User interface	LED & App				
Communication with BMS	CAN				
Communication with meter	RS485				
Communication with portal	WIFI stick				
Integrated power control / Zero export control	○ / ○				

Standard Compliance

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Safty	EN 62109-1, EN 62109-2				
EMC	IEC 61000-6-1/-2/-3/-4, IEC 61000-3-11, IEC61000-3-12				

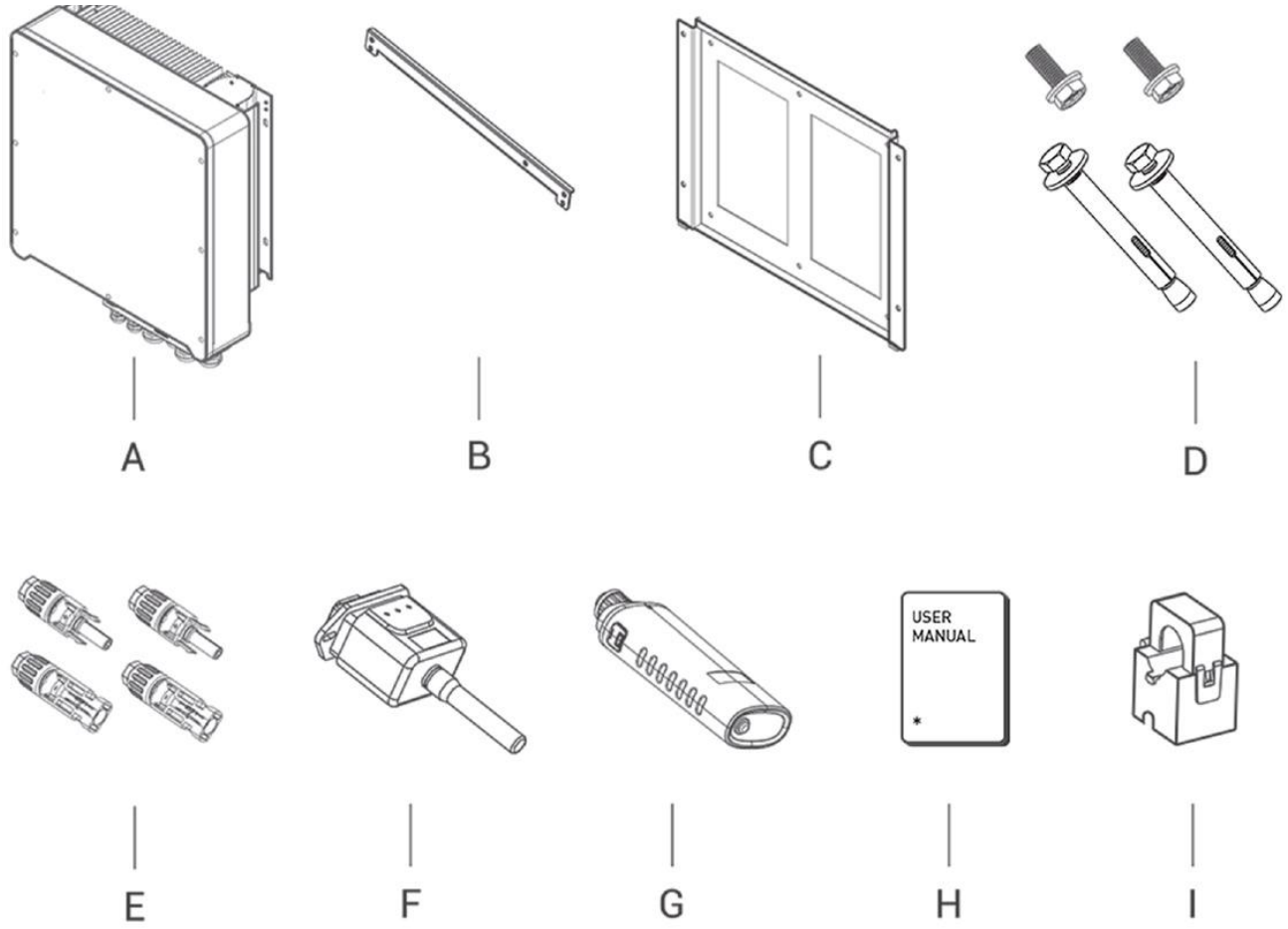
3 Installation

3.1 Check for Physical Damage

Make sure that the inverter is intact during shipment. If there is any visible damage, such as cracks, please contact your dealer immediately.

3.2 Packing List

Open the package and take out the product, please check the accessories first. The package list is shown below.



No.	Description	No.	Description
A	Inverter	F	GPRS module (optional)
B	Crossbar	G	WIFI module
C	Bracket	H	User manual
D	Expansion screws and pan-head screws	I	Current transformer(CT)
E	PV connectors (8KW~12KW: 2×positive, 2×negative; 15KW: 4×positive, 4×negative)		

3.3 Mounting

3.3.1 Installation Precaution

Midea Series inverter is designed for outdoor installation (IP 65). Please ensure that the installation location 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 antennas or antenna cables.

• Not higher than altitude of about 2000m above sea level.

• Not in environment of precipitation or humidity (>95%).

• Under good ventilation conditions.

• The ambient temperature is between -20℃and +60℃.

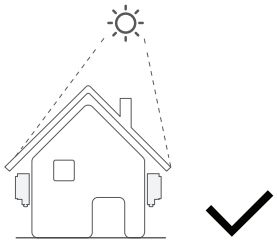
• The slope of the wall should be within ± 5°.

• The wall hanging the inverter should meet the following conditions:

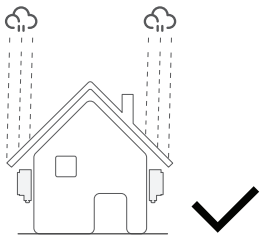
I. Solid brick/concrete, or a mounting surface of comparable strength;

II. Inverter must be supported or reinforced if the wall's strength isn't enough (such as wooden wall, the wall covered by a thick decorative layer)

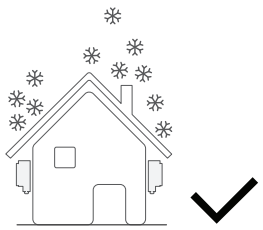
Please AVOIDE direct sunlight, rain exposure, snow accumulation during installation and operation.



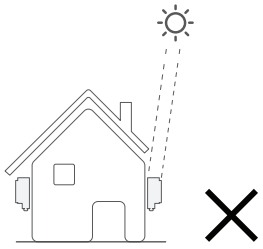
No direct sunlight



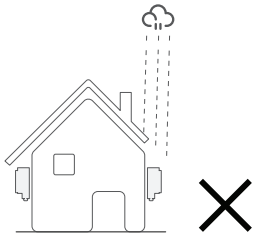
No rain exposure



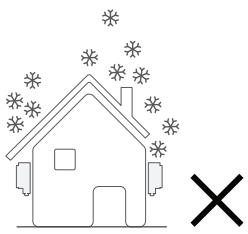
No snow accumulation



Direct sunlight



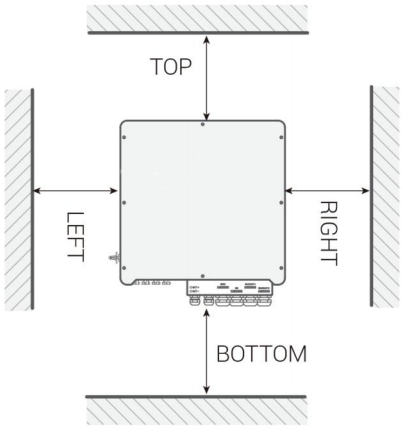
Rain exposure

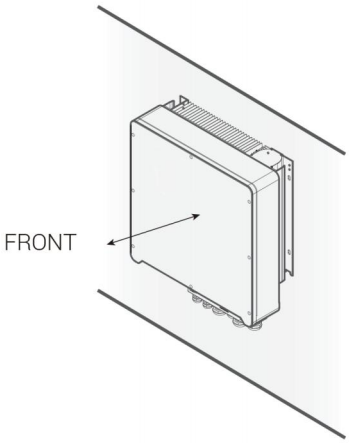


Snow accumulation

3.3.2 Space Requirement

• Space Requirement





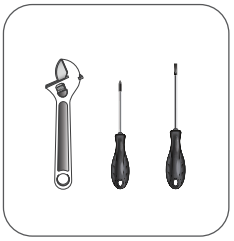
Directions	TOP	BOTTOM	LEFT	RIGHT	FRONT
Min. size (mm)	300	300	300	300	300

3.3.3 Installation Procedure

Tools:

Terminal blocks, RJ45 crimping pliers, screwdrivers, hand wrenches and drills, etc.



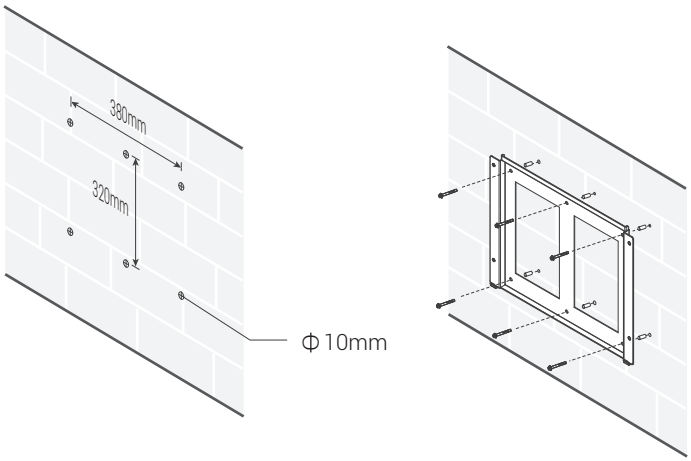



Step 1: Mounting the wall bracket on the wall

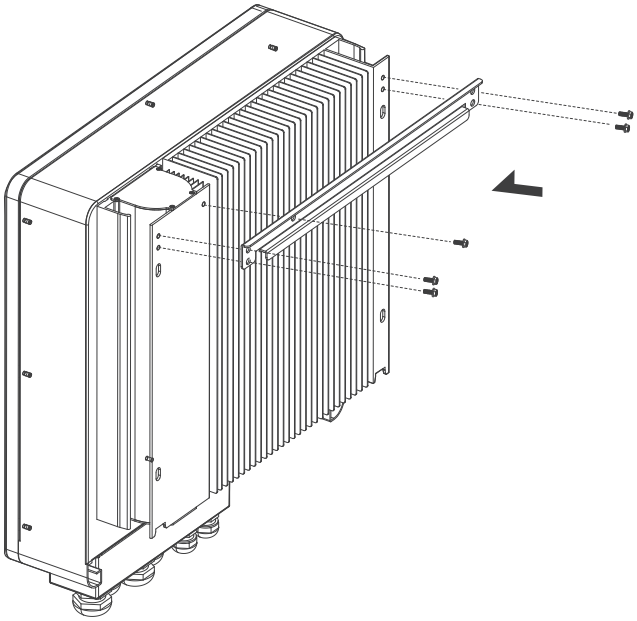
1. Place the bracket on the wall, mark the location of the six holes and then remove it.

2. Drill holes with an drill, making sure they are deep enough (at least 60 mm) to support the inverter.

3. Install the expansion tubes in the holes, and tighten them. Then install the wall bracket with the expansion screws.

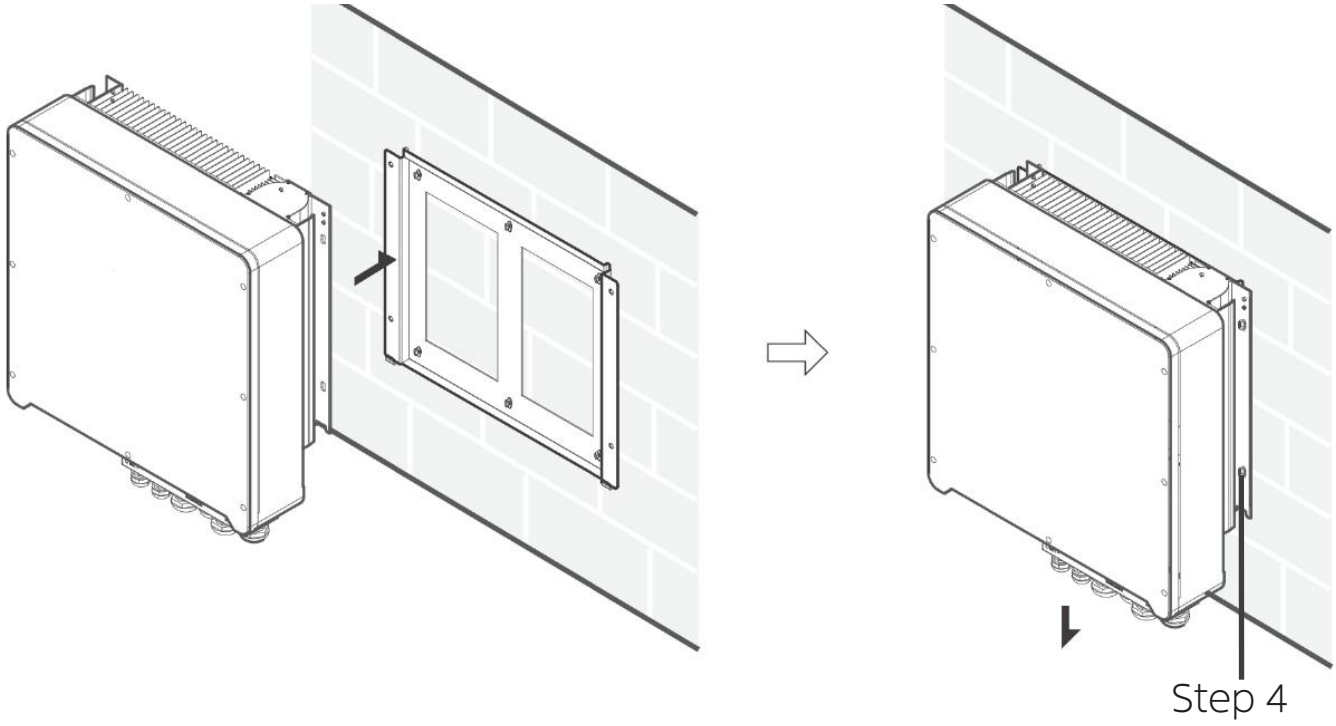


Step 2: Use the screws to fix the crossbar as shown in the figure below.



Step 3: Place the inverter on the wall-mounted bracket by holding the handle on the side.

Step 4: Tighten the fixing screws on both sides of the inverter.



Step 5: If necessary, an anti-theft lock can be installed on the lower left side of the inverter.

4 Electrical Connection

4.1 PV connection

Hybrid Inverter can be connected in series with 2-strings PV modules for 6KW,8KW,10KW,12KW.

Select PV modules with excellent function and reliable quality. The open-circuit voltage of module arrays connected in series should be less than Max. DC input voltage. Operating voltage should be in accordance with MPPT voltage range.

Max.DC Voltage Limitation

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Max. DC Voltage (V)			1000		
MPPT Voltage Range (V)			180~850		

WARNING

• PV module voltage is very high, which already achieve dangerous voltage range, please comply with electric safety rules when connecting.

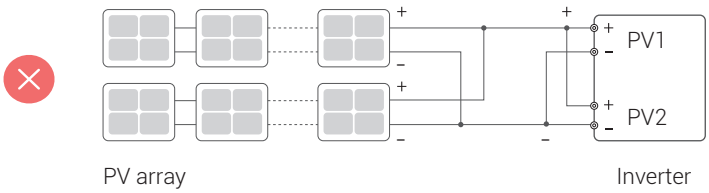
• DO NOT ground the PV positive and negative terminals.

• The following requirements of PV modules need to be applied for each input area.

• DO NOT ground the PV positive and (or) negative terminals.

• To save cables and reduce DC losses, it is recommended to install inverters near the PV modules.

• The following PV connection mode is NOT allowed!

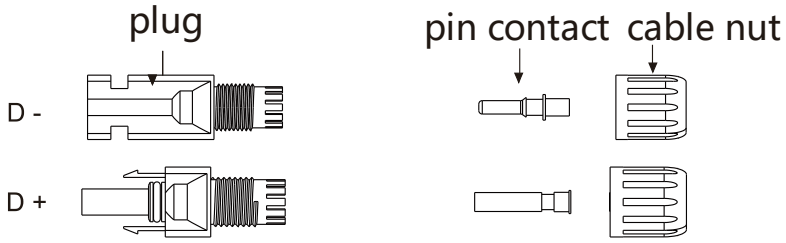


Connection steps:

Step 1 : Inspect PV modules

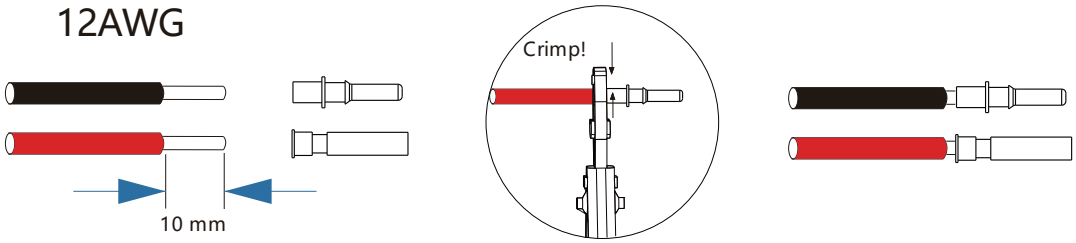
1. Measure the module array voltage with a voltmeter.
2. Check the PV+ and PV- from the PV string combiner box correctly.
3. Please make sure the impedance between the positive pole and negative pole of PV to ground should be MΩ level.

Step 2: Separate DC Connector.

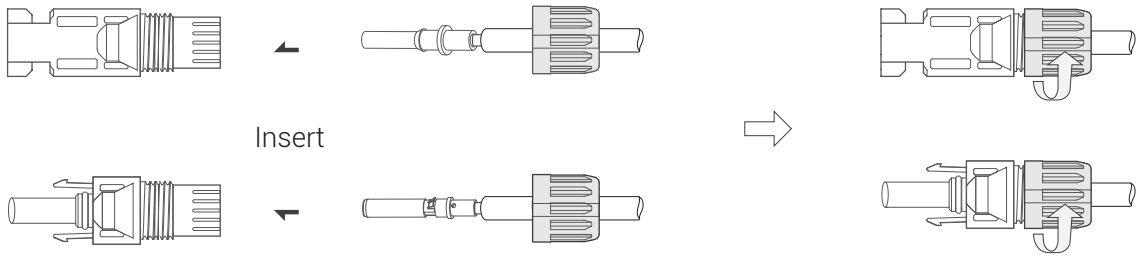


Step 3 : Wiring

1. Connect the 12 AWG wire to the cold crimp terminal.
2. Remove 10mm of insulation from the end of the wire.
3. Insert the insulator into the pin contact and clamp it with crimping pliers.



Step 4 : Insert the pin contact through the nut and into the male or female plug, when a "click" is felt or heard, the pin contact assembly is properly seated. Then tighten the nut.



Step 5 : Plug the PV connector into the corresponding interface on the inverter.

4.2 Grid connection

The Midea series inverters are designed for three-phase grids. The voltage is 380/400/415V and the frequency is 50/60Hz. Other technical requirements should be in accordance with the requirements of the local public grid.

Recommended cables and micro-breakers

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Cable (mm^2)	4~6			6~10	
Micro-breaker (A)	20		32		

Micro-breaker should be installed between inverter and grid, any load should not be connected with inverter directly.

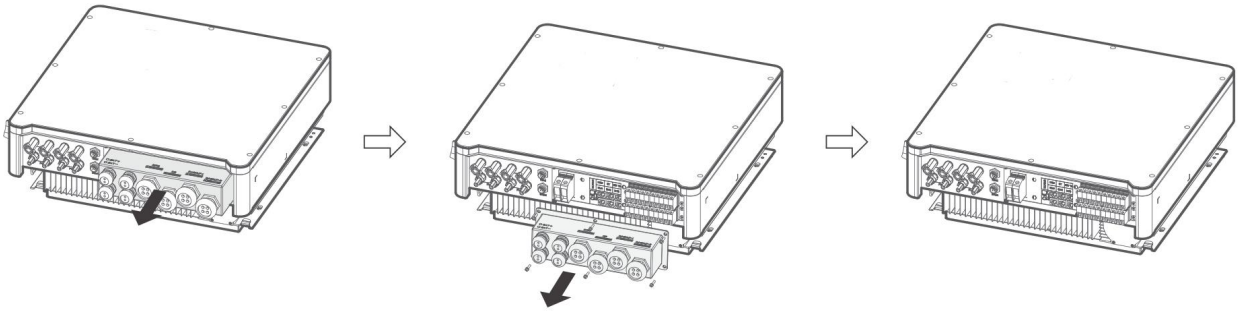
Connection steps:

Step 1: Check the grid voltage.

1. Check the grid voltage and compare it with the allowed voltage range (Refer to technical data).

2. Disconnect the board from all phases and ensure that it is not reconnected.

Step 2: Remove the waterproof lid from the grid port on the inverter.



Step 3: Make the AC wires.

1. Select the appropriate wire (Cable size: refer to Cable Table).

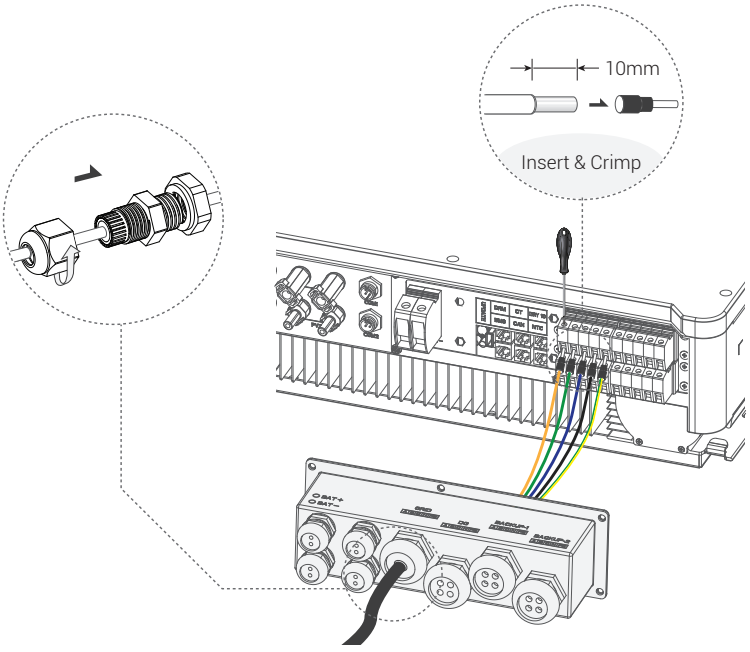
2. It is recommended to keep about 60mm length of cable for crimping.

3. Remove 10mm of insulation from the end of wire.

4. Thread the end of the wire into the tubular terminal and use crimping pliers to crimp it tightly.

5. Disassemble the waterproof connector and waterproof cover and thread the cable through the waterproof connector.

Step 4: Insert the terminals into each of the three phase grid ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).



4.3 EPS Connection (apply to I Version and E Version only)

The Midea series hybrid inverters have both off-grid and on-grid functions. The inverters output power through the AC port when the grid is on and through the EPS port when the grid is off.

I Version & E Version

Midea series inverter provides two versions for customer to choose based on the local rules.

Version I applies to wiring rules that require EPS load-side ground to be isolated from grid-side ground (applies to wiring rules in Australia and New Zealand AS/NZS_3000:2012)

Version E applies to wiring rules that require the load-side ground of the EPS to be un-isolated from the grid-side ground (applicable in most countries).

Auto & Manual

For the "E version" inverters, the EPS function can be triggered automatically or manually, depending on the user's preference.

For the "I version" inverter, the EPS function can only be triggered automatically.

If the user wants to use this function manually, an external switch needs to be installed. Please refer to the specific wiring diagram below.

For solutions, please contact our sales.

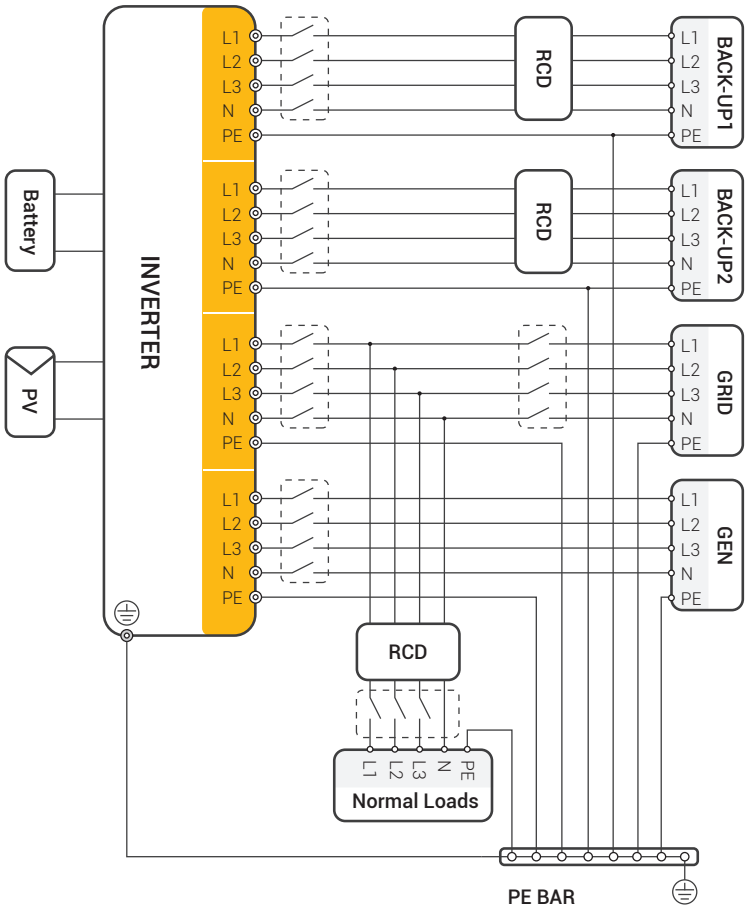
E Version Auto

Transfer switch required.

I Version Auto

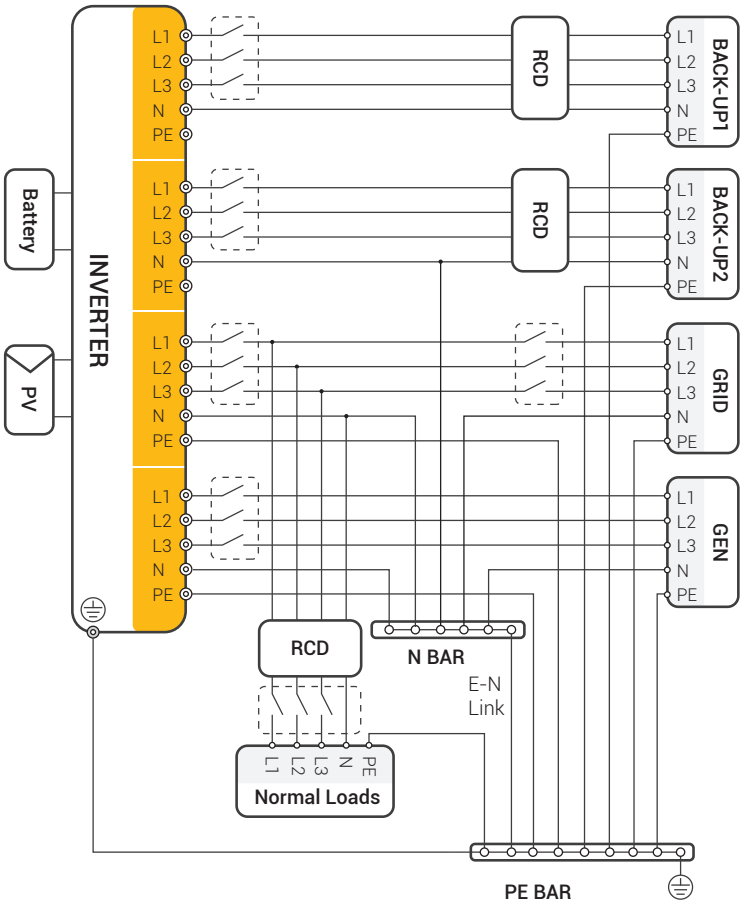
No transfer switch required.

E-Version system diagram



The grounding screw hole of inverter is at the lower right corner.

I-Version system diagram



The grounding screw hole of inverter is at the lower right corner.

* If you have a request for a compatible contactor, please contact our sales.

• If local policies dictate a wiring pattern that is inconsistent with the above operating guidelines, especially for N (neutral) wire, earth and RCD, please contact us before operating! This wiring diagram is for reference only and complete electrical connections should be made in accordance with local regulations.

The Midea series hybrid inverters have grid-on and grid-off functions. When the grid is on, the inverter will output power through the AC port, while when the grid is off, it will output power through the BACKUP ports.

BACKUP1 for very important load, BACKUP2 for important or normal load.

When there is a power outage or no grid,

• If the battery does not report low voltage or under voltage alarm, the inverter will supply power to both BACKUP1 and BACKUP2.

• If the battery has a low voltage or under voltage alarm, the inverter only supplies power to BACKUP1.

• The total output power of the BACK-UP1 and BACK-UP2 must not exceed the rated output power.

Recommended cables and micro-breakers

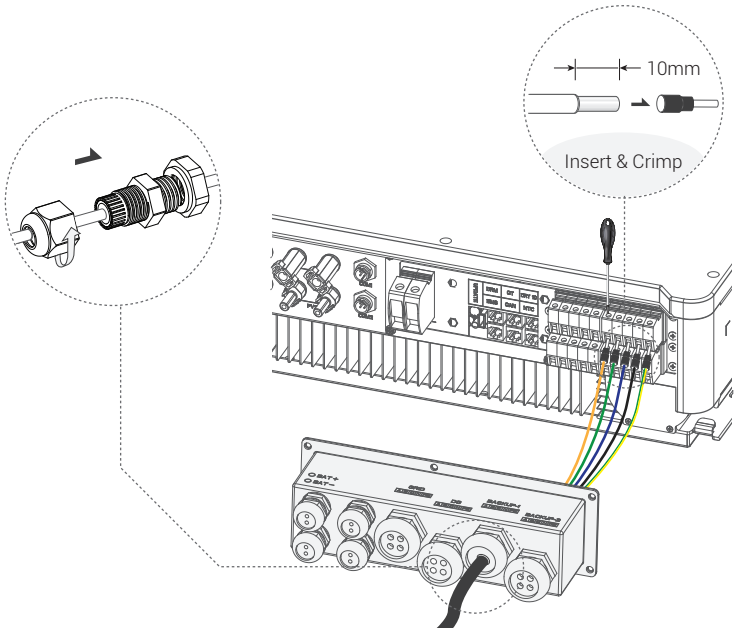
Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Cable (mm^2)	4~6			6~10	
Micro-breaker (A)	20		32		

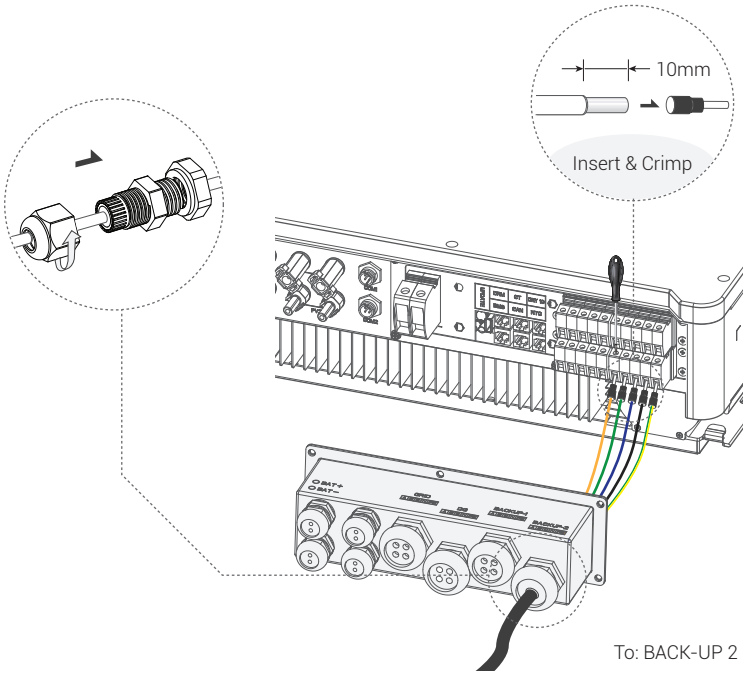
Connection steps:

Step 1 : Make EPS wires.

1. Select the appropriate wire (Cable size: refer to Cable Table).
2. It is recommended to keep about 60mm length of cable for crimping.
3. Remove 10mm of insulation from the end of wire.
4. Thread the end of the wire into the tubular terminal and use crimping pliers to crimp it tightly.
5. Disassemble the waterproof connector and waterproof cover and thread the cable through the waterproof connector.

Step 2 : Insert the terminals into the EPS port of the inverter (loosen or tighten the crimp terminal screws with a one-way screwdriver).





Requirements for EPS loads

WARNING

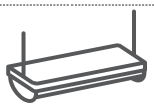
Make sure the rated load power of the EPS is within its rated output range, otherwise the inverter will shut down with an "overload" warning.

When an "overload" occurs, adjust the load power to ensure it is within the EPS output power range before turning on the inverter.

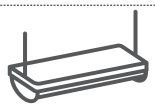
For non-linear loads, make sure that the surge power should be within the output power range of the EPS.

The following table shows some common feasible loads for your reference.

Common feasible loads for reference

Type	Power		Common equipment	
	Start	Rated		
Resistive load	R1	R1	 Incandescent lamp	 TV
Capacitive load	R2	R1.5	 Fluorescent lamp	
Inductive load	R3~5	R2	 Fan	 Fridge

For example:

Equipment	Power	
	Start	Rated
 Incandescent lamp : **100W**	100VA (W)	100VA (W)
 Fluorescent lamp: **40W**	80VA (W)	60VA (W)
 Fridge: **150W**	450~750VA (W)	300VA (W)

4.4 Battery Connection

The charge/discharge system of Midea series hybrid inverters is designed for high voltage lithium batteries.

Before selecting a battery, please note that the battery communication should be compatible with the Midea series hybrid inverter.

Battery breaker

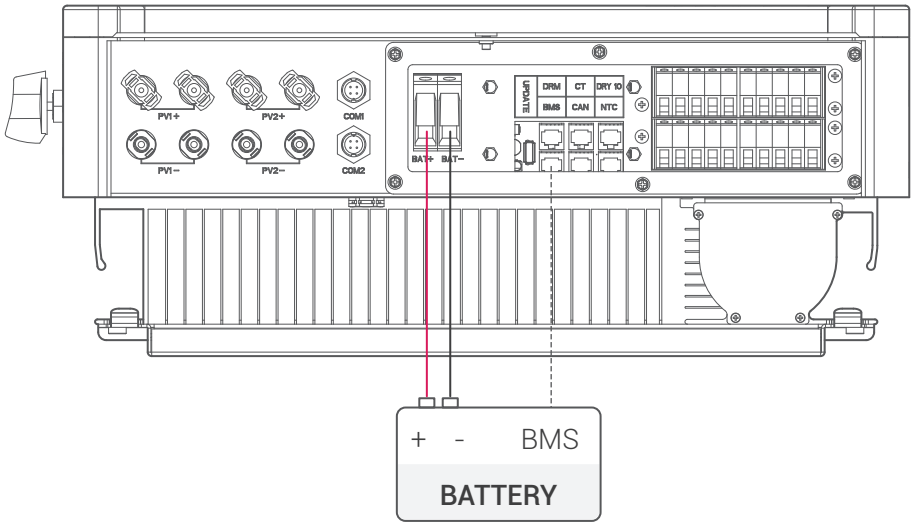
Before connecting to the battery, install a non-polarized DC circuit breaker to ensure that the inverter can be safely disconnected during maintenance.

Recommended non-polar DC breaker-breaker

Model	ME-HT6H	ME-HT8H	ME-HT10H	ME-HT12H	ME-HT15H
Voltage	Nominal voltage of DC breaker should be larger than maximum voltage of battery				
Current (A)	63				

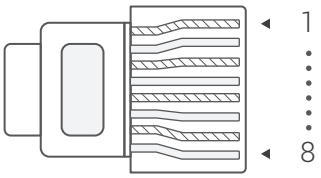
Battery connection diagram

Battery connection



BMS PIN Defination

The communication interface between the inverter and the battery is RJ45, and its protocol is RS485 or CAN.



BMS PIN definition

PIN	1	2	3	4	5	6	7	8
RS485	×	×	×	×	×	GND	BMS_485A	BMS_485B
CAN	×	×	×	BMS_CANH	BMS_CANL	×	×	×

When using RS485 protocol, please note that PIN2 must be disconnected.

• The battery communication can only work when the battery BMS is compatible with the inverter.

Battery connection steps:

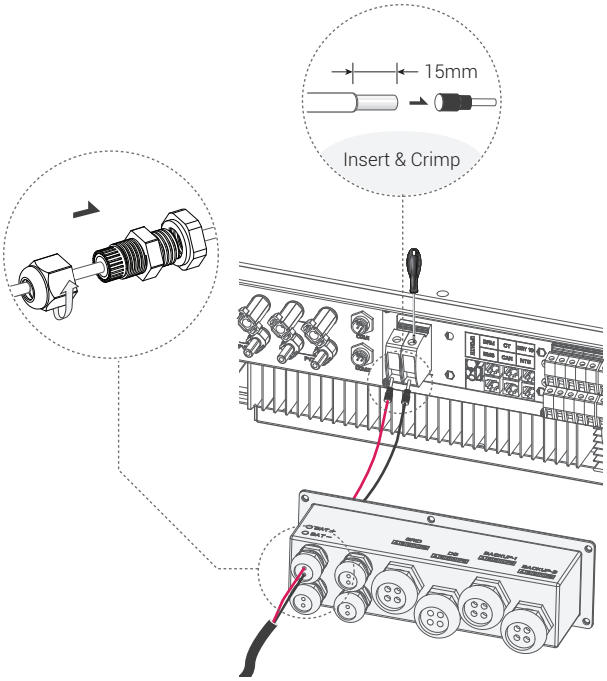
Step 1: Select the 10mm2 wire and remove 15mm of insulation from the end of wire.

Step 2: Thread the end of the wire into the tubular terminal and use crimping pliers to crimp it tightly.

Step 3: Disassemble the waterproof connector and pass the cable through the waterproof connector.

Step 4: Insert the terminals into battery ports on the inverter.

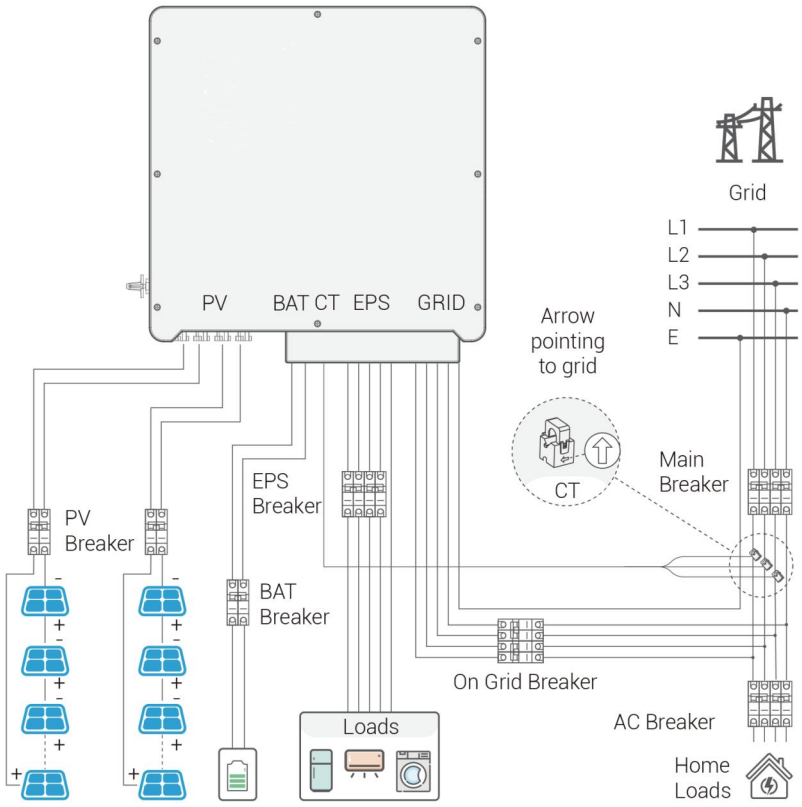
Step 5: Assemble waterproof connectors and waterproof cover.



4.5 CT Connection and Phase instruction

CT is used for monitoring the power usage for entire house, at the meantime, inverter will also need the data from Meter to achieve the Export Control Function.

CT connection and phase wiring diagram



- The CT arrow points to the grid, otherwise the inverter will display wrong data or the machine will not work properly.
- Pay attention to phase sequence when wiring. With incorrect phase sequence, the inverter will not operate properly.

CT connection steps:

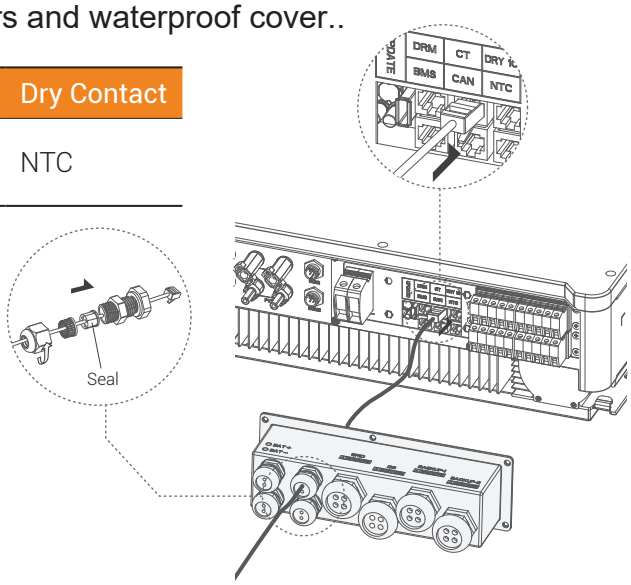
Step 1: Disassembly of waterproof connector and waterproof cover.

Step 2: Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step 3: Insert RJ45 end of the CT cable into the CT port of the inverter.

Step 4: Assemble waterproof connectors and waterproof cover..

DRM	CT	Dry Contact
BMS-485 BMS-CAN	Parallel	NTC

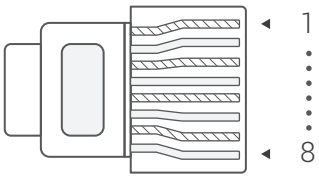


4.6 DRM Connection (Function temporarily retained)

The DRM supports several demand response modes by transmitting control signals as shown below.

NOTE: Only PIN6 (DRM0) is available now, other PIN functions are under development.

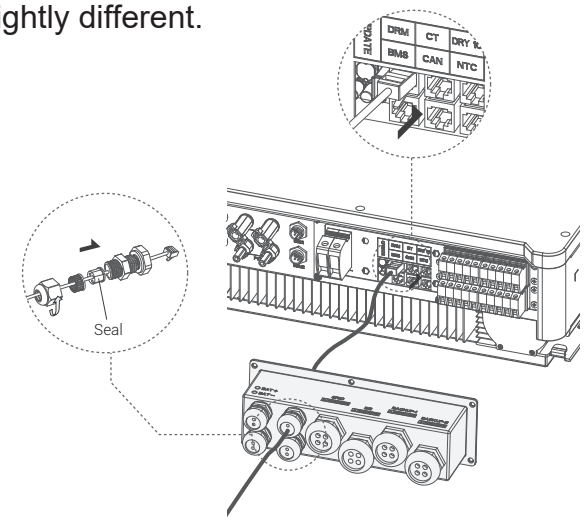
BMS PIN definition



PIN	1	2	3	4	5	6	7	8
Definition	DRM1/5	DRM2/6	DRM3/7	DRM4/8	+5V	DRM0	GND	GND

DRM connection steps:

Please refer to CT steps for DRM connection. Please kindly note that the definition of PIN and the location of the port will be slightly different.



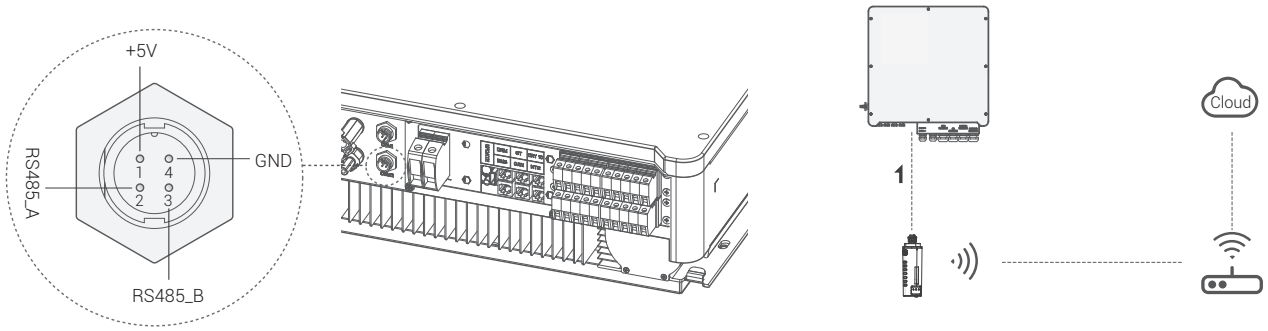
The seal is for waterproofing. Please make sure it is put back in.

4.7 WiFi Connection

The inverter provides a WiFi port that allows data to be collected from the inverter and transmitted to a monitoring website via WiFi.

Purchase this WiFi adaptor from the supplier if needed.

WiFi connection diagram



WiFi connection steps:

Step 1 : Assemble WiFi adaptor to COM2(WiFi) port at the bottom of the inverter.

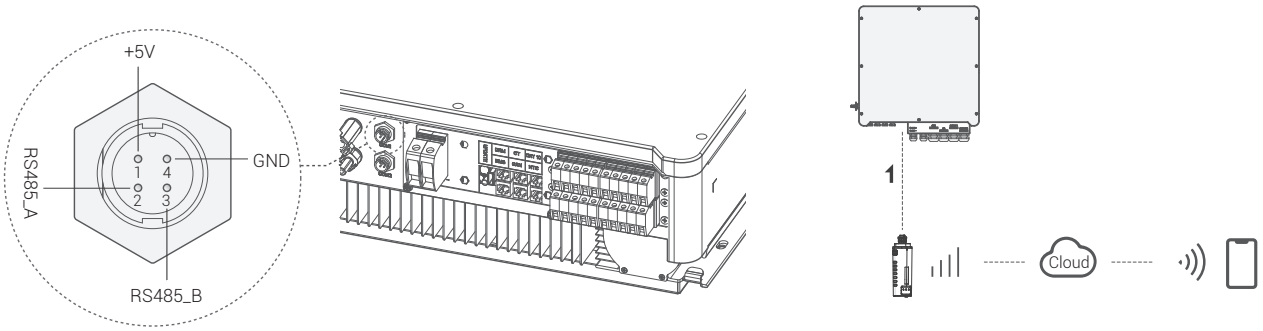
Step 2 : Establish the connection between the inverter and the router.

Step 3 : Create a user account online. (Please check the " WiFi adaptor user manual" for more details).

4.8 GPRS Connection (optional)

Midea hybrid inverters offer a GPRS (radio frequency) interface to control the switching time of a given load via a smart plug (which can be purchased from the supplier if required), thus allowing the load to consume mainly PV energy during operation and minimizing energy costs.

GPRS connection diagram



GPRS connection steps:

Please refer to the " Smart Plug user manual" for detailed connection steps. Com1 is the GPRS port.

4.9 Inverter Manipulation

Start inverter after checking all the following steps:

- ✓ Make sure the inverter is fixed well on the wall.
- ✓ Make sure all DC wiring and AC wiring is complete.
- ✓ Make sure the meter/CT is well connected.
- ✓ Make sure the battery is well connected.
- ✓ Make sure the external load contactor is well connected.
- ✓ (If needed) Turn on the AC switch and EPS switch.
- ✓ Turn on the PV/DC switch and the battery switch.

Check the inverter:

Step 1: Check the status of the indicators.

If the light on the left is not green, please check the following three items:

- All the connections are correct.
- All the external breakers are switched on.
- The DC switch on the inverter is in the “ON” position.

Step 2: If it is the first time to start, please follow this procedure. For specific settings, please refer to Section 5 (Setting).

Step 3: Set up the wifi according to the wifi user manual.

Step 4: Perform "self-test". (for Italy only). Self-test according to CEI 0-21 (only for Italy).

The self-test is only used for inverters that are operated and commissioned in Italy.

According to the Italian standard requirements, all inverters entering the utility grid are equipped with a self-test in accordance with CEI 0-21. During the self-test, the inverters are continuously checked for protection response times and values for overvoltage, undervoltage, overfrequency and underfrequency.

5 Setting

5.1 LED Panel

Instructions for LED Indicator

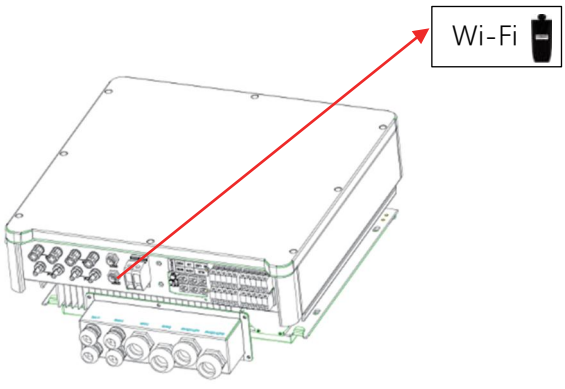
LED Indicator	Status	Description
PV	On	PV input is normal.
PV	OFF	PV is unavailable.
BAT	ON	Battery is active.
BAT	OFF	Battery is unavailable.
GRID	ON	GRID is available and normal.
GRID	OFF	GRID is unavailable.
EPS	ON	EPS power is available.
EPS	OFF	EPS power is unavailable.
ALARM	ON	Fault has occurred and inverter shuts down.
ALARM	OFF	No fault.

5.2 APP SETTING

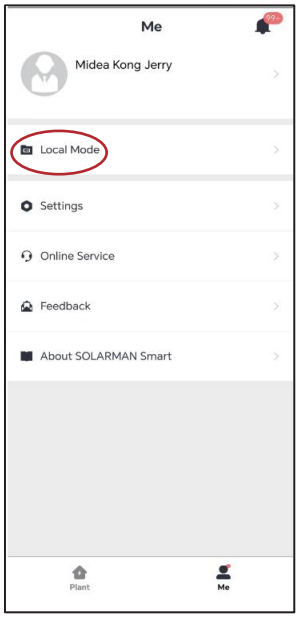
5.2.1 APP quick installation

a. Download and install the app "Solarman Smart" on your mobile phone.

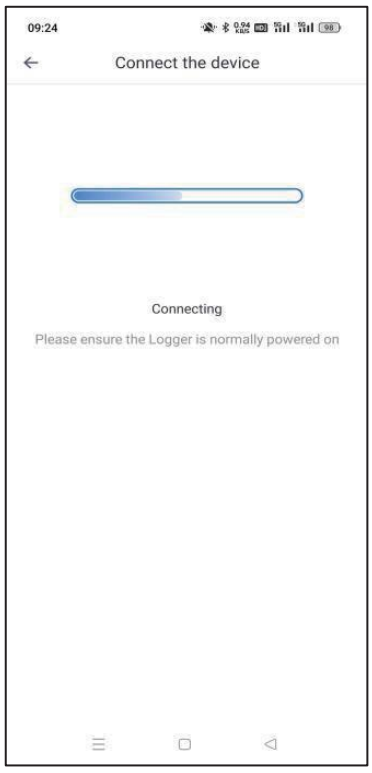
b. Connect the inverter to the collector first, and ensure that the COM and READY leds on the right of the data collector are blinking.

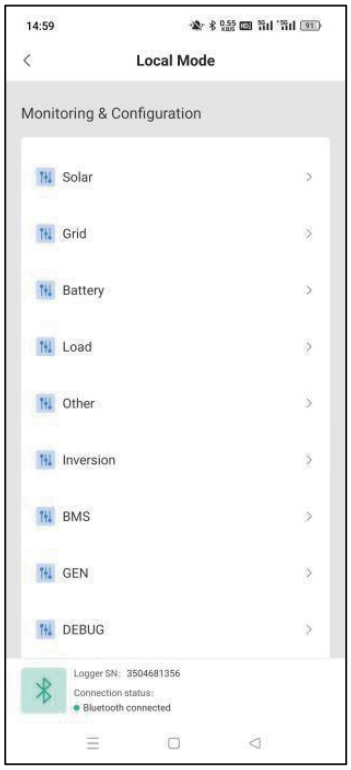


c. Open the APP and go to the main interface of the APP. Click "Local Mode", make sure your Bluetooth is enabled, scan the QR code on the collector or manually enter the serial number to connect to the collector.

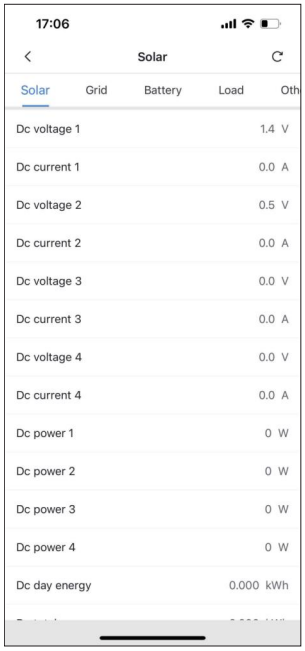


d. After the connection is successful, the COM indicator is steady on and the READY indicator is blinking.





When this page is displayed, it means that the connection is successful and the equipment is in normal working condition, and the inverter parameters can be monitored through the software.

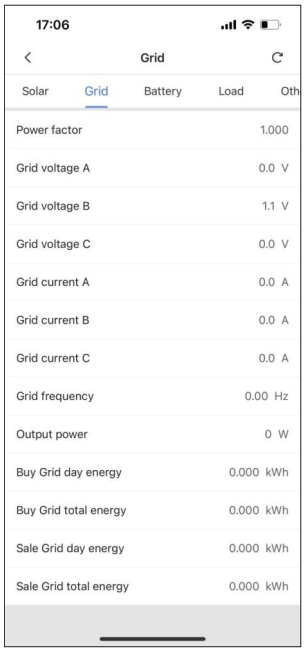


5.2.2 Display interface

5.2.2.1 Solar page

Real-time parameters about the PV. This page shows the voltage and current, power, and energy parameters on the DC side.

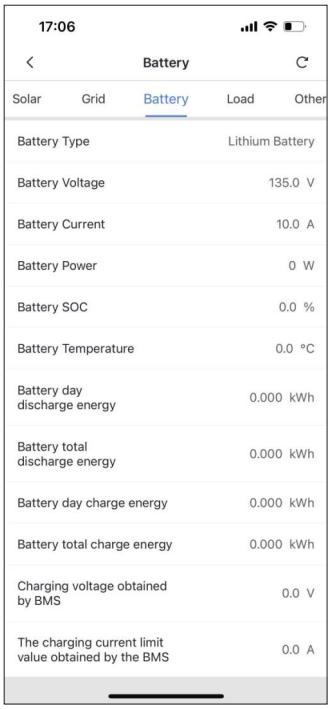
- **Dc voltage :** PV input real-time voltage.
- **Dc current :** PV input real-time current.
- **Dc power :** PV input real-time power.
- **Dc day energy :** PV input power daily.
- **Dc total energy :** PV input power totally.



5.2.2.2 Grid page

Real-time parameters about the grid.

- **Power factor :** Power factor.
- **Grid voltage :** Gird-phase real-time voltage.
- **Grid current :** Gird-phase real-time current.
- **Grid frequency :** Real-time frequency.
- **Output power :** The power of output to Grid, “ + ”means sell power to Grid. “ - ” means buy power from Grid.
- **Buy Grid day energy :** Consumption of energy from Grid daily.
- **Buy Grid total energy :** Consumption of energy from Grid totally.
- **Sale Grid day energy :** Consumption of energy from PCS daily.
- **Sale Grid total energy :** Consumption of energy from PCS totally.

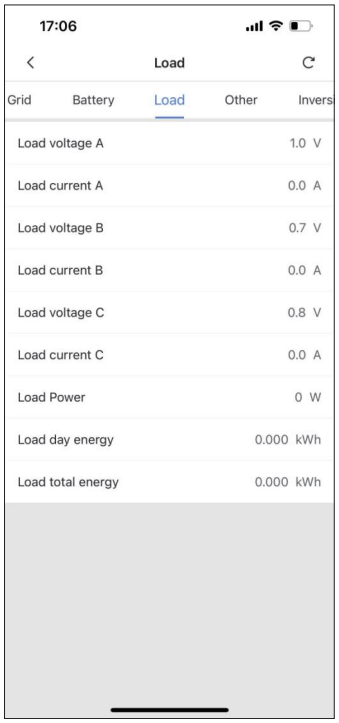


5.2.2.3 Battery page

Real-time parameters about the battery.

- **Battery type :** (lead-acid, lithium battery, DC-SOURCE).
- **Battery Voltage :** Battery real-time voltage.
- **Battery Current :** Battery real-time current.
- **Battery Power :** Charge power. “ + ”means charge, “ - ” means discharge.
- **Battery SOC:** Percentage of battery capacity from the BMS.
- **Battery Temperature :** Battery temperature.
- **Battery day discharge energy :** Battery discharge energy daily.
- **Battery total discharge energy :** Battery discharge energy totally.
- **Battery day charge energy :** Battery charge energy daily.
- **Battery total charge energy :** Battery charge energy totally.
- **Charging voltage obtained by BMS :** Charge voltage from BMS.
- **The charging current limit value obtained by the BMS :** Charge current limit from BMS.

...



5.2.2.4 Load page

Real-time parameters about the load.

Synonymy: BACK-UP/EPS/LOAD.

- **Load voltage :** Load-phase real-time voltage.
- **Load current :** Load-phase real-time current.
- **Load Power :** Output power of Load.
- **Load day energy :** Output power of Load daily.
- **Load total energy :** Output power of Load totally.

5.2.2.5 Other page

Some information from inverter.

· **Power Level :** This interface show inverter model, for example 5.0kW,8.0kW.

· **Inverter State :** Displays the inverter status information (INIT, STANDBY, PV GRID,BAT GRID, HYBRID POW, AC BAT CHG, PV BAT CHG, BYP, FAULT).

· **Work mode :** Displays the working mode, including SELFCONSUME, PEAK SHIFT, BAT PRIORITY.

· **ARM Version :** Show Software version.

· **DSP Version :** Show Software version.

· **SN :** Show module SN.

· **Inverter Temperature :** Show inverter Temperature.

· **Environment Temperature :** Show environment Temperature.

· **Current Fault State :** Show current fault.

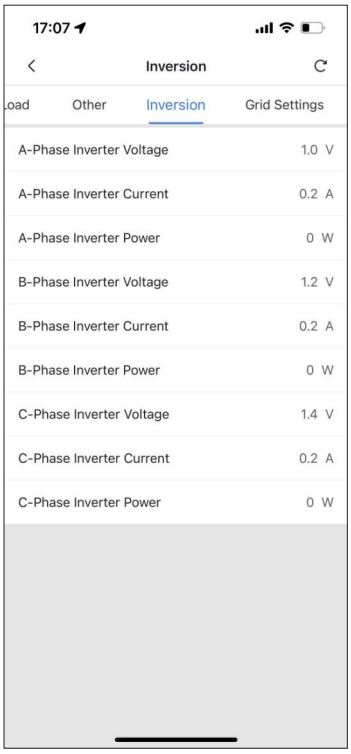
· **Positive BUS voltage :** Real-time voltage of bus capacitor of the inverter.

· **Negative BUS voltage :** Real-time voltage of bus capacitor of the inverter.

· **System Status Word :** Value of the actual system status.

· **INV States :** Displays the inverter status information,including: STANDBY, OFF GRID, GRID, OFF GRID PL, INV TO PFC.GRID: Grid connected state.
OFF GRID PL: Working state of off-grid conversion to grid connection.
INV TO PFC: Status of power by public grid turn into on grid working mode.

· **DCDC States :** Displays charging and discharging status information, including: STANDBY, CHARGE, DISCHARGE.



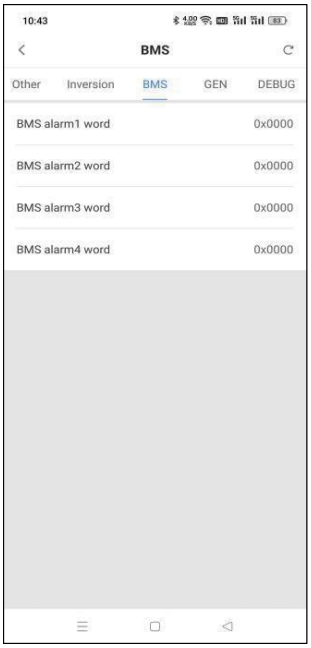
5.2.2.6 Inversion page

Internal parameters for on-site problem analysis, not for end users.

· **Phase Inverter Voltage :** INV -phase real-time voltage.

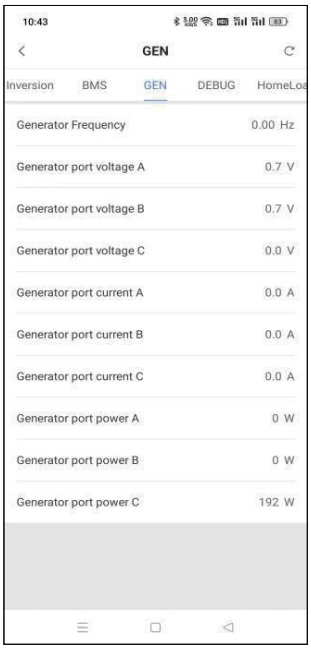
· **Phase Inverter Current :** INV -phase real-time current.

· **Phase Inverter Power :** INV -phase power.



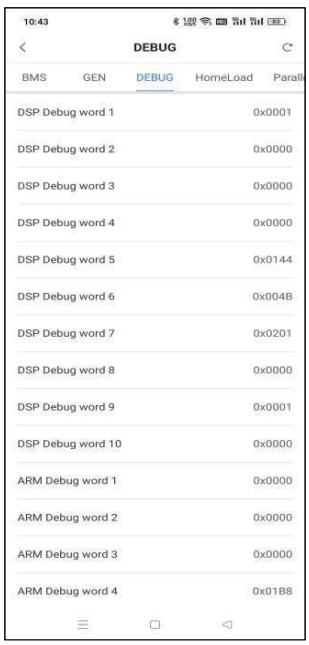
5.2.2.7 BMS page

This screen displays the alarm code obtained by the BMS when an inverter alarm is generated.



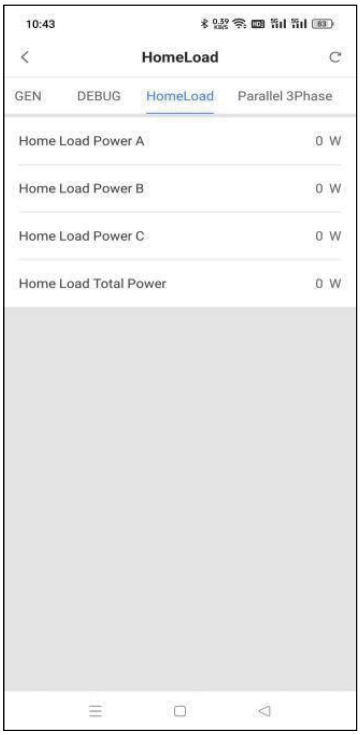
5.2.2.8 GEN page

This screen displays the input voltage frequency, voltage, current, and power parameters of the generator.



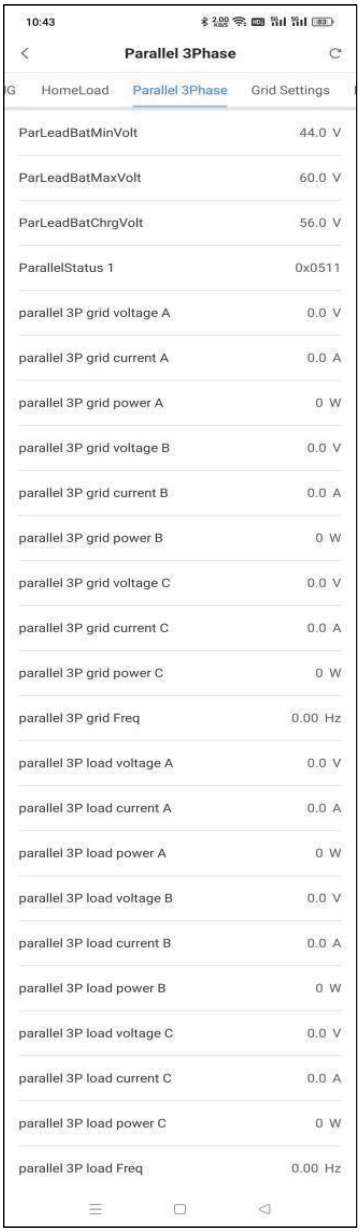
5.2.2.9 DEBUG page

Special debugging instruction code.



5.2.2.10 Home Load page

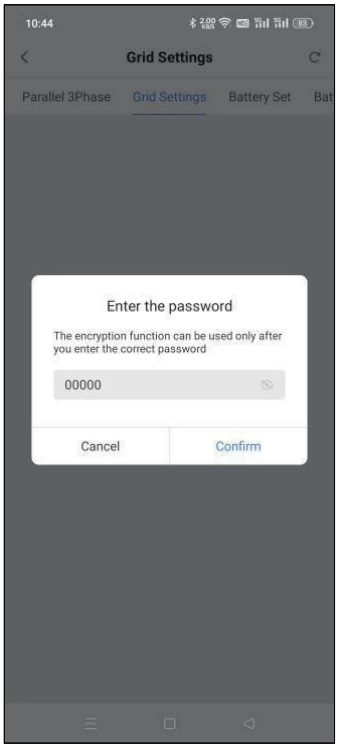
The home load parameter takes effect only when the home load is connected.



5.2.2.11 Parallel 3Phase page

Group three - phase parameter interface, available only when the three - phase is enabled. If you need to use, please consult local dealers.

5.2.3 APP Parameter setting page



5.2.3.1 Grid settings

You need to enter a password to access the grid Settings screen. The default password is 00000.

· **Grid Std :** This interface is used to select Grid standard. (see 5.2.3.1.1)

· **Vac Min :** The input value of Grid low voltage. (This is valid only if the grid standard is ”custom”)

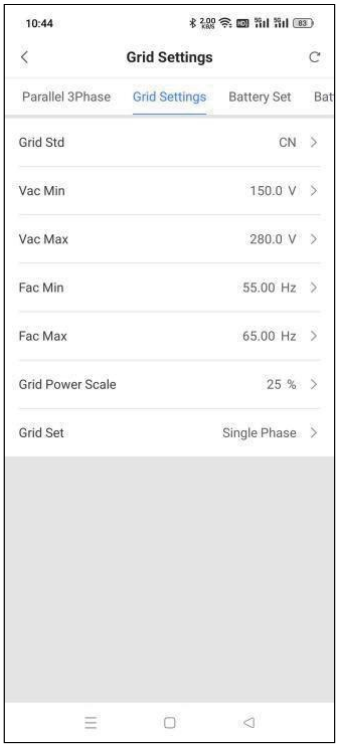
· **Vac Max :** The input value of Grid high voltage. (This is valid only if the grid standard is ”custom”)

· **Fac Min :** The input value of Grid low frequency. (This is valid only if the grid standard is ”custom”)

· **Fac Max :** The input value of Grid high frequency. (This is valid only if the grid standard is ”custom”)

· **Grid Power Scale :** The input value is power percent of grid.

· **Grid Set :** Select the grid parameters to which you are connected, Includes Single phase, Spilt phase, US 208V, JP 120V.

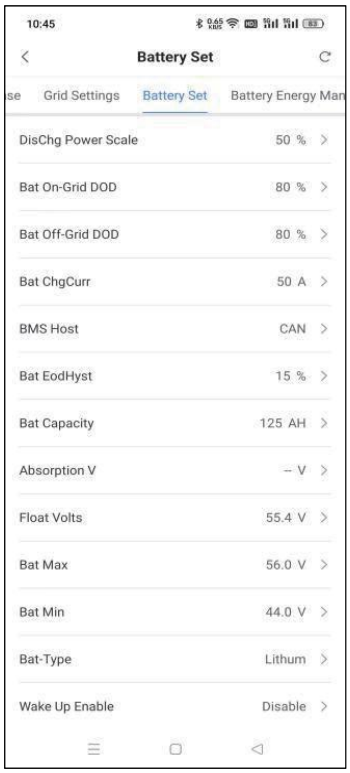


5.2.3.1.1 Grid standard

Grid Std
-> AU
AU-W
NZ
UK
VDE
KR
PHI
CN
US-CA
THAIL
SA
CUSTOM
POL
EN50549
VDE4105
JPN
ITA
SLO
CZE
SWE
HU
SK

1:AU-Australia	240V/415V 50Hz
2:AU-W-Western Australia	240V/415V 50Hz
3:NZ-New Zealand	240V/415V 50Hz
4:UK-United Kingdom	230V 50Hz
5:PK	230V 50Hz
6:KR-Korea	220V/380V 60Hz
7:PHI-Philippines	110V/220V 60Hz
8:CN-China	220V/380V 50Hz
9:US-CA-America	120V/240V208V/240V 60Hz
10:THAIL	220/380V 50Hz
11:ZA	230V 50Hz
12:CUSTOM-User defined	-
13:POL	230V/380V 50Hz
14:EN50549	217V/220V/240V 380V/400V 50HZ/60Hz
15:VDE4105-Germany	230V/380V 50Hz
16:Japan	110V/190V/60Hz
17:Italy	230V/380V/50Hz
18: Slovenia	230V/380V/50Hz
19: Czech Republic	230V/380V/50Hz
20: Sweden	230V/380V/50Hz
21: Hungary	230V/380V/50HZ
22: Slovakia	230V/380V/50HZ

If none of the above options are available, please consult your dealer.



5.2.3.2 Battery set

· **DisChg Power Scale :** The input value is power percent of battery discharge. The default value is 100%.

· **Bat On-Grid DOD :** The depth of battery discharge when connected to the grid. When the battery discharge exceeds the DOD parameter, the inverter generates a low voltage or under voltage alarm, and the battery stops discharging.

· **Bat Off-Grid DOD :** The depth of battery discharge when off-grid. When the battery discharge exceeds the DOD parameter, the inverter generates a low voltage or under voltage alarm, and the battery stops discharging.

· **Bat ChgCurr :** The amount of current that can be set to charge the battery.

· **BMS Host :** This interface is used to select battery communication BMS type, including RS485, and CAN. The default option is CAN.

· **Bat EodHyst :** Return stroke error of discharge current, when the SOC is lower than the set point, it must go back to (SOC+Bat EodHyst), and the battery can discharge, otherwise, can not discharge. The default value is 20%.

· **Bat Capacity :** The battery capacity setting will affect the maximum charging current, for example, set 100Ah, the maximum charging current is 100A*0.2=20A. (The input value ranges from 50 to 1000).

· **Absorption V :** The voltage at which a lead-acid battery is charged at constant voltage.

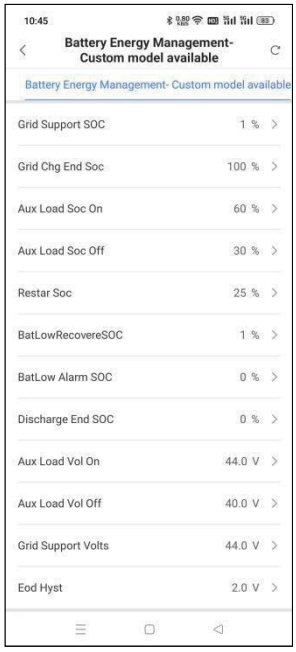
· **Float Volts :** Set the lead-acid battery charging voltage. (The input value ranges from 40 to 58).

· **Bat Max :** Only for lead acid Battery.

· **Bat Min :** Only for lead acid Battery.

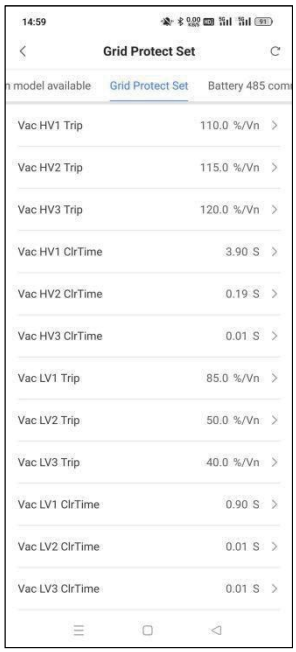
· **Bat-Type :** Set the type of battery, according to the battery demand can be set DC source (for testing use only), lithium battery, lead-acid battery.

· **Wake Up Enable:** If you want to use this feature, consult your battery brand dealer. When the battery level is low and the battery relay has been disconnected, the inverter will send a command to the battery to forcibly suck the relay through the BMS, and the inverter will charge. After the battery wakes up successfully, please turn off the function, otherwise it will affect the normal operation of the machine.



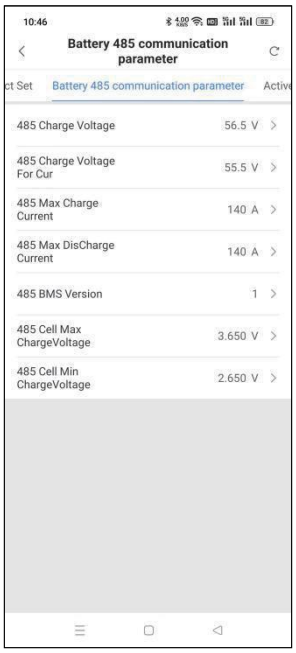
5.2.3.3 Battery Energy Management-Custom model available

This function only applies to some models, please consult the corresponding supplier whether it can be used.



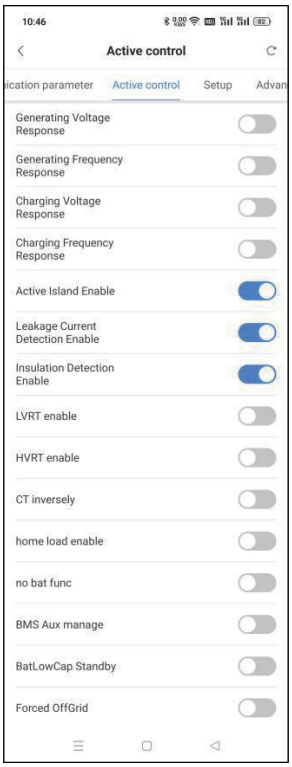
5.2.3.4 Grid Protect Set

Customers do not need to change the Grid protection Settings. If any modification is required, consult the local supplier.



5.2.3.5 Battery 485 communication parameter

- **485 Current Charge voltage :** Set the 485 current charging voltage.
- **485 Charge voltage for cur :** Set the 485 charge current limiting start voltage.
- **485 Max. Charge current :** Set the maximum charge current of the 485.
- **485 Max. Discharge current :** Set 485 Max. Discharge current.
- **485 BMS Version :** Set the maximum charge current of the 485.
- **485 Cell Max Charge Voltage :** Set the maximum voltage of the 485 unit.
- **485 Cell Min Charge Voltage :** Set the minimum voltage of the 485 unit.



5.2.3.6 Active control

· **Generation voltage response :** When the grid voltage is abnormal, the active power is limited, and the function is enabled when required by the national grid standard.

· **Generation frequency response :** When the power grid frequency is abnormal, the active power will be limited, and the function will be enabled if required by the national power grid standard.

· **Charge voltage response :** When the grid voltage is abnormal, the charging power will be limited, and the function will be enabled if required by the national grid standards.

· **Charge frequency response :** When the power grid frequency is abnormal, the charging power will be limited, and the function will be enabled if required by the national power grid standard.

· **Active Island Enable :** When the grid goes down, inverter will detect the loss of power and disconnect from the grid within milliseconds. It prevents your solar panels from feeding electricity into a downed power line. (The default option is enable).

· **Leakage Current Detection Enable :** Leak current detect (The default option is enable).

· **Insulation detection Enable :** When the insulation detection function is enabled in the grid-connected state, the insulation detection is performed once a day when the photovoltaic energy comes in, and the inverter switches to the By-pass band load. If the inverter is off-grid, the output will be disconnected during insulation detect and the load will stop working. (The default option is enable).

· **LVRT enable :** means low voltage trip protection, and undervoltage protection can be realized after opening.

· **HVRT enable :** means high voltage trip protection. and overvoltage protection can be realized after opening.

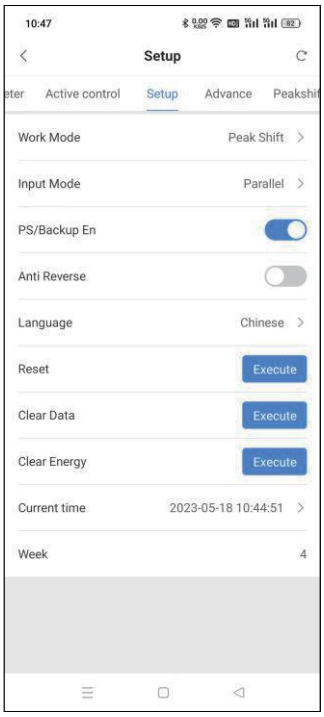
· **CT inversely :** Enable/disable CT inversely. Reverse the current detected by the CT of the power grid. This function is applicable to reverse the CT detection of the power grid.

· **No Bat func :** Enable/disable the battery-free system.

· **BMS Aux MANAGE :** When the BMS of the battery does not have a disable charge or discharge function, the inverter will automatically reduce the power to avoid overcharging or over discharging the battery. The default option is disabled.

· **Bat Low Cap Standby :** When there is no photovoltaic power supply at night, and the battery.

· **Forced Off Grid :** The inverter is forced to disconnect from the power grid. The default option is disabled.



5.2.3.7 Setup

· **Work Mode :** This interface is used to select the working mode, includes SELFCONSUME, PEAK SHIFT, BAT PRIORITY. The default setting is SELFCONSUME.

· **Input Mode :** Setup of PV Input mode (**INDEPENDENT :** The default Settings, **PARALLEL :** This feature is for test use only, not customer use, **CV :** This feature is for test use only, not customeruse) .The default setting is Independent.

· **PS/Backup En :** When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

· **Anti- Reverse :** Whether Inverter isn't allowed to generate electricity to the Grid, The default option is disable, Enable means that it isn't allowed to generate electricity to the Grid.

· **Language :** Set the system language, including Chinese and English**.**

· **Reset :** Execute the command to perform a factory reset.

· **Clear Data :** Execute a command to clear data.

· **Clear Energy :** Execute the command to clear statistics.

· **Current time :** Current time setting for the PCS.

· **Week :** Day of week.

5.2.3.8 Advance

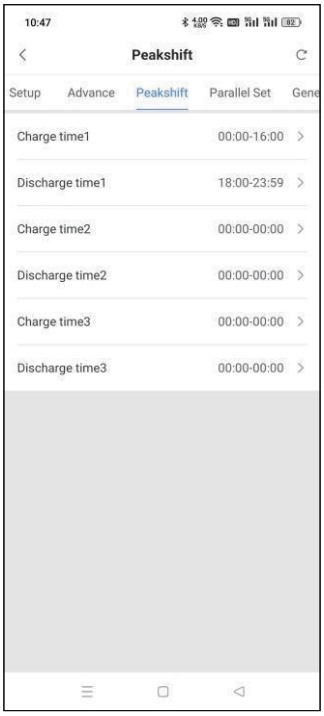
· **On/Off Button En :** After this button is enabled, you need to manually press the switch button to start the inverter. Otherwise, the inverter will be in standby state. After disabling the button, the inverter will start immediately upon power-on.

· **ARC Enable :** After this function is enabled, DC arc pulling phenomenon can be detected, and the inverter can be shut down in time when arc pulling phenomenon occurs again.

· **Power Factor :** The input value should range between L0.80 and L0.99 or C0.8 and C1.00.

· **Reactive Power :** Reactive power control. The input value should range between -60% and +60%, which varies with the standard.

· **Reactive Type :** Including: Power Factor, React Power Qu Wave Qp Wave. (For specific country if required by the local grid).

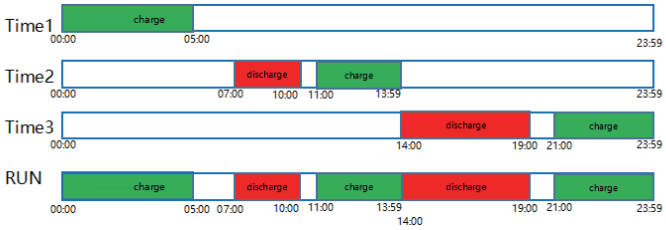


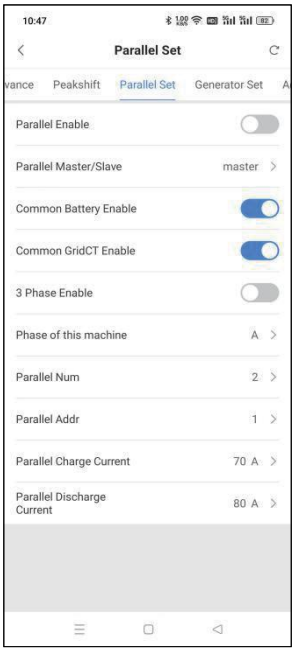
5.2.3.9 Peakshift

This time range is enabled only when the working mode is Peak shift.

· **Peak shift :** This function allows three charge and discharge cycles to be set to ensure that the inverter's time is local when the time is set. This parameter is set to one day, if the specified time conflict, the first time is executed as the master time; If the three time ranges do not conflict, the three time ranges are executed sequentially.

If you want to set a continuous charging time from the first night to the next morning. For example, you want charge battery form first day 21:00pm to next day 5:00am, divide this time period into two time periods (21:00~23:59, 00:00~05:00), and select two charging time periods from Time1, Time2 and Time3 and set them





5.2.3.10 Parallel Set

· **Parallel Enable :** Enable/Disable the parallel function.

· **Parallel Master/Slave :** In a parallel system, the master unit broadcasts the bms and other information to the slavers. Make sure only one unit is configured as master.

· **Common Battery Enable :** Common battery or independent battery.

· **Common GridCT Enable :** If using Common CT connection Method, this feature needs to be enabled. To enable this feature, you need to change the CT model, please contact your dealer.

· **3 Phase Enable :** Enable the three-phase function.

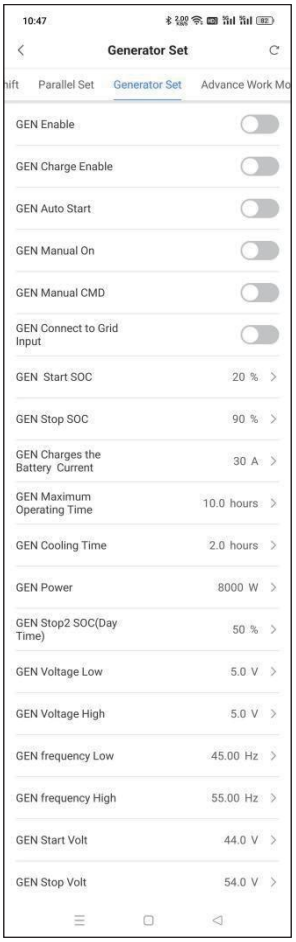
· **Phase of this machine :** Local phase of unit for three phase installation（reserved function）.

· **Parallel Num :** Set the number of parallel machines, and select the number of units to include hosts.

· **Parallel address :** According to the number of parallel machines with numerical coding, each machine address can not be repeated.

· **Parallel charging current :** The sum of the charging current of the master and slave, and the charging current of each machine = parallel charging current / number of parallel units.

· **Parallel discharge current :** The sum of the discharge current of the master and slave, the discharge current of each machine = parallel discharge current / number of parallel units.



5.2.3.11 Generator Set

This page is the generator settings, and you can modify the parameters of this section through this page

· **GEN Enable :** Enable control of the Generator function.

· **GEN Charge Enable :** Generator Charge Enable control.

· **GEN Auto Start :** If the user wants the Generator to be automatically controlled to start and stop through the dry contact, Enable it.

· **GEN Manual ON :** If the user wants the Generator to be controlled manually, Enable it. Manual En should be opposed to Automatic control En.

· **GEN Manual CMD :** The on/off command in manual control mode.

· **GEN Connect to Grid Input :** Connect the Generator to the grid input port.

· **GEN Start SOC :** When the SOC of battery is lower than the setpoint，the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started.

· **GEN Stop SOC :** When the SOC of battery is higher than the setpoint，the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be stopped.

· **GEN Charges the Battery current :** It indicates the maximum current that the inverter charges the battery from Generator.

· **GEN Maximum Operating Time :** It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. The value 240 means 24hours in which state the Generator will not be shut down all the time. The unit is 0.1 hour.

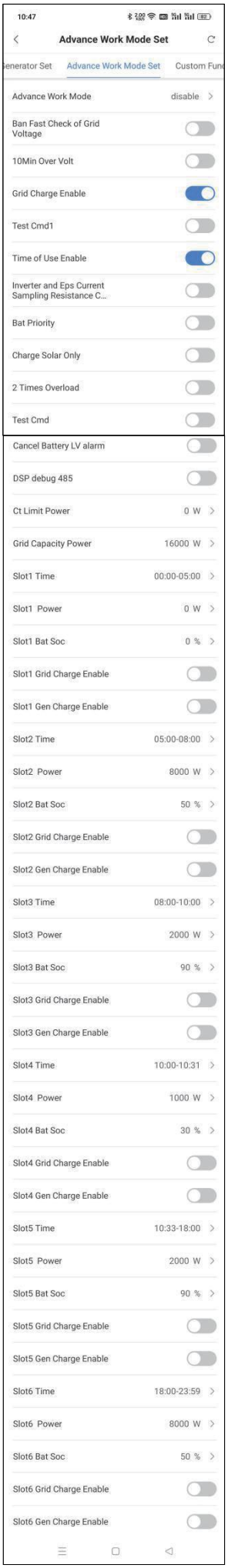
· **GEN Cooling Time :** It indicates the waiting time of the Generator to restart after it has reached the running time. The unit is 0.1 hour.

· **GEN Power :** Rated power of Generator.

· **GEN Stop2 SOC (Day Time) :** Reserve function.

· **GEN Voltage Low/High :** Generator low voltage, high voltage alarm setting value.

· **GEN Start /Stop Volt :** Battery voltage Sets the value for turning on and off the generator.



5.2.3.12 Advance Work Mode Set

· **Advanced mode work :** There are three advanced modes available: Sell First, limit grid consumption, zero export. The Basic mode feature is automatically disabled when you enable Advanced mode.

①**Sell First :** First consider selling electricity to the grid. In this mode the anti-reflux setting is automatically disabled. The users can use this mode to sell back surplus solar power to grid. If time of use is enabled, the battery power can also be sold to grid（Excess PV and battery power can be sold to the grid）.

②**limit grid consumption :** In this mode, the ct limiters are used to sense the grid power flow direction. The hybrid inverter can be choosed to sell power or not sell power to grid. There is a CT Limit Power parameter available in this mode. When the battery is needed to discharge to reduced the load consumption, the grid will cover the parameter set part consumption firstly and the battery discharges energy to makes up the rest part. Other conditions are similar to SELF CONSUME working mode (Excess PV power can be sold to the grid through CT Limit)..

③**zero export :** In this mode, the ct limiters should be installed in the input of the inverter's grid port. The hybrid inverter will not sell power to grid. The user can use Zero export power parameter to ensure the inverter won't feed back power to grid（Neither PV nor battery excess power is sold to the grid）.

· **Grid Charge Enable :** It is a high-level control attribute of grid charge enable. If time of use function is disabled, this attribute is used to judge whether or not to charge the battery by grid. If time of use function is enabled, the battery can be charged by grid only when the time slot grid charge attribute is enabled.

· **Bat priority :** Battery priority enable switch.

· **Charge Solar Only :** If user don't want to use grid to charge the battery in any time, please enable this attribute. The photovoltaic energy will be used first for the load, and then the excess energy will be used to charge the battery. If the photovoltaic energy is insufficient, the battery will power the load.

· **CT limiting power :** CT limiting power can be set.

· **Grid Capacity Power :** grid capacity can be set.

· **Slot1 Time :** Time range setting.

· **Slot1 Power :** The charging and discharging power of the battery.

· **Slot1 Bat SOC :** Battery SOC Settings within a time range. When the actual SOC of the battery is greater than the set value, the battery is in discharge state. When the actual SOC of the battery is less than the set value, the battery is charged.

· **Slot1 Grid Charge Enable :** Grid charging is allowed in Slot1. Available only when Grid charge enable is on.

5.2.3.12 Advance Work Mode Set

· **Slot1 Gen Charge Enable :** Gen charging is allowed in Slot1.

There are 6 slots which can be programmed. You can set the advanced mode first, and then set the battery to charge or discharge in the set time, choose grid charge or generator charge.

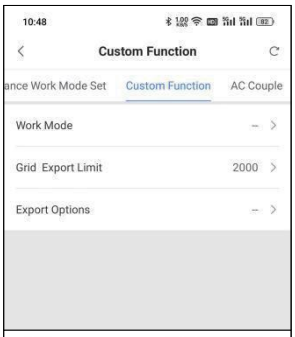
The following functions do not need to be configured.

· **Ban Fast Check of Grid Voltage :** Enable/disable fast abnormal detection of power grid voltage.

· **10Min Over Volt / Test Cmd1 / Inverter and eps current sampling resistance change / 2 Times Overload / Test CMD / :** /.

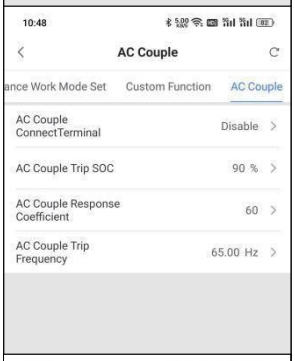
· **DSP debug 485 :** Enable or disable DSP debug 485.

· **Cancel Battery LV alarm :** When the battery voltage reaches the battery low value, the system forcibly enables the battery voltage no-alarm function.



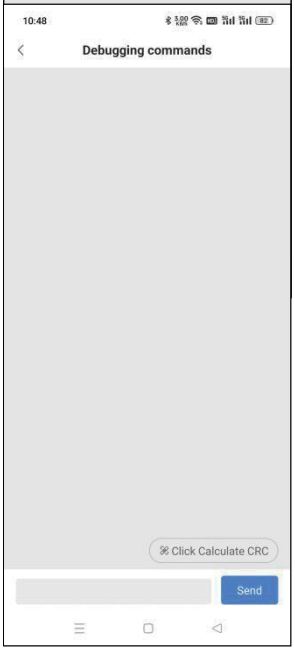
5.2.3.13 Custom Function

This interface is customized. If you need to customize the interface, contact your local supplier.



5.2.3.14 AC Couple

This interface is customized. If you need to customize the interface, contact your local supplier.



5.2.3.15 Debugging commands

This interface is used to debug serial port communication, Special for testing.

6 Fault diagnosis and solutions

The following table li`sts some basic problems that may occur in practice and the corresponding basic solutions. When you encounter the following problems, please refer to the following solutions.

- If the problem is still not solved, please contact your local distributor.
- If an error occurs that is not listed in the table, please contact customer service.

Codes:	00
Content:	DischgOverCur

Explaination:

Battery discharge over current. When the battery is loaded, the load is too large.

Solutions:

- Nothing need to do, Wait one minute for the inverter to restart.
- Check whether the load is in compliance with the specification.
- Disconnect all power and shut down all inverters; disconnect the load and restart the inverter with power.

Codes:	01
Content:	Over Load

Explaination:

The load power is greater than other power(PV,BAT).

Solutions:

- Check whether the load is in compliance with the maximum power of the inverter.
- Disconnect all power and turn off all inverters; disconnect the load, power up and restart the inverter, and if the fault has been cleared, check the load again for a short circuit.
- If the error/warning remains, please contact customer service.

Codes:	02
Content:	BatDisconnect

Explaination:

Battery Disconnect. (Battery voltage not identified)

Solutions:

- Check whether the battery is connected.
- Check if battery wiring port is open circuited.
- If the error/warning remains, please contact customer service.

Codes:	03
Content:	Bat Under Vol

Explaination:

Battery voltage lower than normal range.

Solutions:

• Checking system settings, re-power and restart.

• Check if the grid power down. If so, waitting for the grid power up, the inverter will automatically charge.

• If the error/warning remains, please contact customer service.

Codes:	04
Content:	Bat Low capacity

Explaination:

Bat Low capacity

Solutions:

• Low battery setting capacity (SOC<100%-DOD)

Codes:	05
Content:	Bat Over Vol

Explaination:

The battery voltage is over than the Inverter maximum voltage.

Solutions:

• Checking system settings, re-power and restart.

• If the error/warning remains, please contact customer service.

Codes:	06 / 07
Content:	Gird low vol / over vol

Explaination:

Grid voltage is abnormal.

Solutions:

• Check if the grid is abnormal.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	08 / 09
Content:	Gird lowFreq / overFreq

Explaination:

Grid Frequency is abnormal.

Solutions:

• Check if the grid is abnormal.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	10
Content:	Gfci over

Explaination:

Inverter GFCI exceeds standard.

Solutions:

• Check PV string for direct or indirect grounding phenomenon.

• Check peripherals of inverter for current leakage.

• If the error/warning remains, please contact customer service.

Codes:	13
Content:	Bus under vol

Explaination:

BUS voltage is lower than normal.

Solutions:

• Check the input mode setting is correct.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	14
Content:	Bus over vol

Explaination:

BUS voltage is over maximum value.

Solutions:

• Check the input mode setting is correct.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	15
Content:	Inv over cur

Explaination:

The inverter current exceeds the normal value.

Solutions:

• Restart the inverter and wait until it functions normally.

Codes:	16
Content:	Chg over cur

Explaination:

Battery charge current over than the Inverter maximum voltage.

Solutions:

• Restart the inverter and wait until it functions normally.

Codes:	18 / 19
Content:	Inv under vol / over vol

Explaination:

INV voltage is abnormal.

Solutions:

• Check if the INV voltage is abnormal.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	20
Content:	Inv Freq Abnor

Explaination:

INV frequency is abnormal.

Solutions:

• Check if the INV frequency is abnormal.

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	21
Content:	Igbt temp high

Explaination:

The inverter temperature is higher than the allowed value.

Solutions:

• Disconnect all power from the inverter, wait one hour, and then turn on the power to the inverter.

Codes:	22
Content:	Bat BMS failure

Explaination:

BMS detected a battery alarm.

Solutions:

• Restart the battery and see if the alarm is cancelled.

Codes:	23
Content:	Bat over temp

Explaination:

Battery temperature is higher than the allowed value.

Solutions:

• Disconnect the battery and reconnect it after an hour.

Codes:	24
Content:	Bat UnderTemp

Explaination:

Battery temperature is lower than the allowed value.

Solutions:

• Check the ambient temperature near the battery to comfirm it meets the specifications.

Codes:	25
Content:	The battery cell pressure difference is large

Explanation:

BMS monomer differential pressure alarm.

Solutions:

• Check whether the battery cell voltage difference is too large.

Codes:	26
Content:	Bat reverse connection

Explanation:

The anode and cathode of the battery are reversed.

Solutions:

• Detect whether the positive and negative poles of the battery are connected reversely.

Codes:	27
Content:	BMS comm.fail

Explanation:

Communication between lithium battery and inverter is abnormal.

Solutions:

• Check the cable, RJ45 header, line sequence.

• Checking the Battery switch.

Codes:	28
Content:	Bat failure

Explanation:

The anode and cathode of the battery are reversed.

Solutions:

• Check whether the battery is abnormal.

• Check whether the battery BMS alarm is normal.

Codes:	29
Content:	Bypass overload

Explanation:

Excessive load power.

Solutions:

• Check whether the load power exceeds the inverter power.

Codes:	30
Content:	Grid Phase error

Explanation:

The power grid phase sequence is incorrectly connected.

Solutions:

• Check power grid wiring.

Codes:	31
Content:	Arc Fault

Explaination:

PV Arc Fault

Solutions:

• Check Photovoltaic panels, PV wire.

• If the error/warning remains, please contact customer service.

Codes:	32 / 33
Content:	Bus soft fail / Inv soft fail

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	34 / 35
Content:	Bus short / Inv short

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	36
Content:	Fan fail

Explaination:

Fan fail

Solutions:

• Check whether the Inverter temperature is abnormal.

• Check whether the fan runs properly.(If you can see it)

Codes:	37
Content:	PV iso low

Explaination:

PV Low insulation impedance.

Solutions:

• Check if the PE line is connected to the inverter and is connected to the ground.

• If the error/warning remains, please contact customer service.

Codes:	38
Content:	Bus Relay Fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	39
Content:	Grid Relay Fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	40
Content:	EPS rly fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	41
Content:	Gfci fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	42
Content:	Current sampling fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait for its normal operation.

• If the error warning persists, please contact customer service.

Codes:	43
Content:	PV short-circuit

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait for its normal operation.

• If the error warning persists, please contact customer service.

Codes:	44
Content:	Selftest fail

Explaination:

PV Low insulation impedance.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

Codes:	45
Content:	System fault

Explaination:

The inverter may be damaged.

Solutions:

• Restart the inverter and wait until it functions normally.

• If the error/warning remains, please contact customer service.

V1.0