

User Manual



H1-G2-WL Series Single-phase Storage Inverter

H1- 2.5~6.0 -E-G2-WL

AC1- 2.5~6.0 -E-G2-WL

H1- 4.6~6.0 -E1-G2-WL

AC1- 4.6~6.0 -E1-G2-WL

To prevent damage to the product caused by improper use, please carefully read this manual before operation.

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1 Notes on This Manual

H1-G2-WL series inverters are designed and tested in accordance with international safety requirements. Certain safety precautions must be taken when installing and operating this inverter. The installer must read and follow all instructions, cautions and warnings in this installation manual.

1.1 Scope of Validity

This manual describes the assembly, installation, commissioning, maintenance and troubleshooting of the following model(s) of products:

H1-2.5-E-G2-WL	H1-3.0-E-G2-WL	H1-3.7-E-G2-WL	H1-4.0-E-G2-WL
H1-4.6-E-G2-WL	H1-5.0-E-G2-WL	H1-6.0-E-G2-WL	H1-4.6-E1-G2-WL
H1-5.0-E1-G2-WL	H1-6.0-E1-G2-WL		
AC1-2.5-E-G2-WL	AC1-3.0-E-G2-WL	AC1-3.7-E-G2-WL	AC1-4.0-E-G2-WL
AC1-4.6-E-G2-WL	AC1-5.0-E-G2-WL	AC1-6.0-E-G2-WL	AC1-4.6-E1-G2-WL
AC1-5.0-E1-G2-WL	AC1-6.0-E1-G2-WL		

Please keep this manual where it will be accessible at all times.

1.2 Target Group

This manual is intended for use by qualified electricians only. All procedures described herein shall be performed by trained and experienced electrical personnel in compliance with basic electrical safety requirements.

1.3 Symbols Used

The following symbols are used in the manual to highlight information in order to ensure the safety of the user's person and property when using the product, and to use the product more efficiently and optimally. The following symbols may appear in this manual, and the meanings they represent are listed below:

Danger!

"Danger" indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Warning!

"Warning" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Note!

"Note" provides important tips and guidance.

Symbols	Explanation
	CE mark. The product complies with the relevant EU directives.
	RCM mark.
	RoHS mark.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the inverter!
	Hazards, warnings and cautions. Important safety information regarding personal safety. Failure to follow the safety information in this manual could result in injury or even death.
	Capacitor discharge. Before opening the cover, the inverter must be disconnected from the grid and the PV string. Wait at least 5 minutes for the storage capacitors to discharge completely.
	Read the manual before performing any operations on the inverter.
	Product should not be disposed as household waste.
	PE conductor terminal.

2 Safety Precautions

2.1 Personnel Safety

Danger!

Operating Requirements

- High voltage exists inside the equipment. Unauthorized removal of necessary protective measures, improper use, and improper installation and operation may cause serious safety hazards, shock hazards, or equipment damage, and the resulting damage to the equipment is not covered by the warranty.
- Do not energize the equipment without completing the installation or without professional confirmation, and strictly prohibit operation with electricity.

Warning!

Operating Requirements

- Always use special insulated tools for wiring operations. Direct contact or contact with other conductors or indirect contact with the power supply equipment through wet objects is prohibited.
- During operation of the equipment, the enclosure temperature is high and there is a risk of burns. Before touching any part of the inverter, make sure that the equipment and its surfaces are at a contact-safe temperature and voltage before proceeding.

Note!

Personnel requirements

- All operations, including transportation, installation, start-up and maintenance, must be performed by qualified and trained personnel.
- Before operating the equipment, be sure to check that it is in proper condition, including, but not limited to, the equipment's parts, safety devices, and meter display.
- If any abnormality is found during operation, do not use the inverter and avoid temporary maintenance of the inverter.
- Special scenario operators, such as electrical operation, high place operation, equipment maintenance operation, etc., must have special operation qualification that meets the requirements of the local country/region, and should comply with local standards and relevant safety codes.
- Strictly follow the safety operation procedures, understand the potential dangers in equipment operation, and take precautions to maximize the safety of themselves and related personnel to prevent accidents caused by improper operation.
- Operators are required to wear appropriate personal protective equipment, including protective clothing, gloves, goggles, and helmets.
- It is strictly prohibited to operate under fatigue, drunkenness, or ill health.
- Take extra care when the inverter is disconnected from the public grid, as certain components may hold a certain voltage, creating a risk of electric shock.
- Before installation, check the machine to make sure that it does not have any damage caused by transportation or handling processes that could affect the insulation or safety distances. Choose the installation location carefully and observe

the specified cooling requirements.

- Before connecting the inverter to the distribution grid, contact the local distribution grid company for approval. This connection must be carried out by a qualified technician.
- Do not use the equipment when the safety devices do not work or are disabled.
- The manufacturer needs to be notified of any non-standard installation conditions.
- All repairs should be carried out only with approved spare parts, which must be installed in accordance with their purpose and by an authorized contractor or an authorized service representative.

2.2 Electrical connection safety

Danger!

Operating Requirements

- Remove all electrical connections from the unit before making electrical connections.
- Before making electrical connections, it is important to verify that the equipment itself and its front and rear switches are disconnected and that reliable locking and marking measures are in place to prevent accidental energization.

Wiring Requirements

- No loads may be connected between the inverter and its directly connected AC circuit breaker.
- Use test equipment to ensure that the PV strings have the correct positive and negative terminals.
- The entire grounding system should remain intact, including the grounding electrode, grounding trunk, branch wires, and connections to the equipment.

Grounding Requirements

- The protective earth conductor needs to remain grounded during installation and when removing the equipment.

Maintenance Requirements

- High voltage exists inside the unit, do not open the unit's mainframe panel.
- Disconnect the corresponding output switch of the power supply unit before performing maintenance on the power supply unit's back-end electricity or power distribution equipment.

Warning!

Wiring Requirements

- In electrical installations, it is important to follow the relevant codes and standards and to use circuit breakers of appropriate specifications to protect the safety of the circuit.

Grounding Requirements

- The grounding resistance should be in accordance with relevant standards and regulations to ensure effective current discharge. Normally, the value of grounding resistance should be small enough to ensure that the current can be quickly directed to earth in the event of a fault.

Maintenance Requirements

- Always use measuring equipment to ensure that the equipment is at contact-safe temperatures and voltages before touching any parts, and wear protective equipment for operation and maintenance of the inverter.

Note!**Wiring Requirements**

- Wires should be secured and supported at appropriate locations to prevent dislodgement or damage due to self-weight or external forces.

Inspection before connection

- Check the appearance and structure of the equipment for damage, whether the equipment received and the actual equipment ordered are the same, and contact Fox ESS in case of doubt, connecting damaged equipment can cause the risk of fire and electric shock.

Wiring Requirements

- Cable slots and crossing holes should have no sharp edges and the location of the pipe or crossing holes should be protected to prevent damage to the cables.

- Strictly follow national and industry standards and codes for electrical wiring for construction and installation.
- Verify that tools and test equipment used are functioning properly, calibrated effectively, and meet safety standards, and check and register the number of tools to prevent them from being left inside the equipment.
- Check that markings and labels on wires, terminals and equipment are clear and accurate.
- Check that connecting terminals are well insulated and protected, free from corrosion, deformation or looseness.
- Incorrect wiring operations can cause accidents such as fire or electric shock, and the resulting damage will not be covered by the warranty.
- Wiring should be clearly labeled to facilitate maintenance and troubleshooting.
- Wiring personnel need to wear appropriate personal protective equipment and use professional insulated tools for operation .
- The grounding system should be tested regularly to check the grounding resistance, connection status, etc. Before operating the equipment, ensure that the equipment is reliably grounded, and find and repair any damage or abnormality in time.
- Cabling should be kept at a safe distance of at least 30mm from high temperature heat sources to prevent aging of the insulation.
- Cables should not block the air inlet and outlet of the equipment.
- After the connection is completed, it should be ensured that the insulation of the wires is restored intact and the exposed conductor parts are effectively insulated.
- The grounded portion should be clearly labeled to alert personnel.
- The grounding connection must be firm and reliable to avoid loose, corrosion, or poor contact. The connection shall be properly treated against corrosion.
- Wiring should be laid neatly and in an orderly manner, avoiding crossings, tangles and excessive bending to minimize the risk of damage to the wires. Select power cords of sufficient length and strictly prohibit making joints or soldering points in power cords.
- The insulation of wires and cables should be intact and have good insulation properties to effectively prevent leakage and short circuit.

- The same kind of cables are tied neatly without outer skin damage, and different kinds of cables are laid out separately, forbidding twisting and crossing.
- Regularly check the system parameters and make records, if anomalies are found, the causes should be identified and dealt with accordingly. If you can not determine the cause of the anomaly, you need to turn to professionals to avoid accidents affecting the use of the system.
- Non-professionals are not allowed to disassemble and overhaul the inverter without authorization, and the operators need to be specially trained.
- Strictly follow the use and maintenance instructions of the product to operate, make sure the warning signs are intact, and replace the signs that become unclear due to long-term use in time.
- Regularly check whether the wiring and connecting terminals of each part of the equipment are firm and whether there is any looseness; especially pay attention to the fan, power module, input terminals, output terminals, grounding, and other parts.
- Place eye-catching warning signs or set up safety warning belts around the products; non-staff are not allowed to enter to avoid mishandling or accidents after unrelated personnel approach the products.
- Hang a "Danger - Do Not Close" tag on the upstream and downstream switches or circuit breakers, and post warning signs to prevent accidental connection.

2.3 Installation Requirements

Danger!

Equipment Protection

- Strictly follow the operation manual and specifications of the equipment to carry out maintenance operations, do not carry out other maintenance operations beyond this manual without authorization to avoid equipment failure due to incorrect operation.
- Prohibit arc welding, drilling, cutting and other operations on the equipment, and prohibit the installation of other equipment on the top of the product.

Drilling Safety

- Avoid pre-buried pipes or lines when drilling to avoid short circuits or other hazards.
- The entire grounding system should be kept intact, including the grounding electrode, grounding trunk, branch lines, and connections to the equipment.
- In electrical installations, it is important to follow the relevant codes and standards and to use circuit breakers of the right size to protect the safety of the circuits.

Note!

Use of Tools

- All tools must be complete, properly certified, and within their inspection validity period. Before use, ensure that the tools are sturdy and free from damage, loose parts, or missing components.

Equipment Protection

- Paint scratches, drops or rust stains that occur during transportation and installation of equipment must be repaired in a timely manner, and long-term exposure of the scratched part may affect the use of the inverter.

Drilling Safety

- Appropriate protective equipment such as goggles, earplugs, helmets, and coveralls should be worn when drilling to prevent splashing debris from hurting eyes and face, reduce noise damage to hearing, and protect the body from injury.
 - Cabling should be kept at a safe distance of at least 30 mm from high temperature heat sources to prevent deterioration of the insulation.
 - Cables should not block the air inlet or outlet of the equipment.
-
- Ensure that there is enough space and good lighting, and avoid using tools in dangerous or unstable environments.
 - Use the tool correctly and operate the tool correctly according to the instruction manual or professional guidance on the correct way to use the tool.
 - Perform regular maintenance, such as cleaning, lubrication, and calibration, to extend the service life of the tools and maintain their performance.
 - Before operation, dust, dirt, and debris need to be removed from the surface of the equipment to prevent them from entering the interior of the equipment and causing damage.
 - Update the operating system and related software of the equipment in time to fix the loopholes and improve the performance.
 - Protect the equipment from external collision and strong vibration.
 - Obtain consent from customers and contractors before drilling.
 - Check the drilling equipment before use, including whether the drill is securely installed, whether the wires are broken, and whether the switch is normal.
 - Ensure that the workpiece being drilled is securely fastened to prevent it from moving or rotating during drilling.
 - When replacing drills, cleaning debris or performing equipment maintenance, strictly prevent debris from falling into the interior of the equipment, and be sure to stop the machine first and then clean up the debris in a timely manner.

2.4 PE Connection and Leakage Current

PV System Residual Current Factors

- In every PV installation, several elements contribute to the current leakage to protective earth (PE). these elements can be divided into two main types.
- Capacitive discharge current - Discharge current is generated mainly by the parasitic capacitance of the PV modules to PE. The module type, the environmental conditions (rain, humidity) and even the distance of the modules from the roof affect the discharge current. Other factors that may contribute to the parasitic capacitance are the inverter's internal capacitance to PE and external protection elements such as lighting protection.
- During operation, the DC bus is connected to the alternating current grid via the inverter. Thus, a portion of the alternating voltage amplitude arrives at the DC bus. The fluctuating voltage constantly changes the charge state of the parasitic PV capacitor (i.e capacitance to PE). This is associated with a displacement current, which is proportional to the capacitance and the applied voltage amplitude.
- Residual current - if there is a fault, such as defective insulation, where an energized cable comes into contact with a grounded person, an additional current flows, known as a residual current.

Residual Current Device (RCD)

- All Fox ESS inverters incorporate a certified internal RD (Residual Current Device) to protect against possible electrocution in case of a malfunction of the PV array, cables or inverter (DC). The RCD in the Fox ESS inverter can detect leakage on the DC side. There are 2 trip thresholds for the RCD as required by the DIN VDE 0126-1-1 standard. A low threshold is used to protect against rapid changes in leakage typical of direct contact by people. A higher threshold is used for slowly rising leakage currents, to limit the current in grounding conductors for the safety. The default value for higher speed personal protection is 30mA, and 300mA per unit for lower speed fire safety.
- The internal RCD only performs leakage current detection in accordance with safety regulations. Its fault threshold cannot be modified, and it cannot fully replace an external RCD. If the current exceeds the permissible limit, the internal RCD will trip and trigger a fault alarm. However, since the internal inverter RCD automatically resets when the residual current is low, no manual reset operation is required.

Installation and Selection of an External RCD device

- Fox ESS recommends installing an external RCD. The installer must check which type of RCD is required by the specific local electric codes. Installation of an RCD must always be conducted in accordance with local codes and standards. Unless a lower value is required by the specific local electric codes, Fox ESS suggests an RCD value between 100mA and 300mA.
- In installations where the local electric code requires an RCD with a lower leakage setting, the discharge current might result in nuisance tripping of the external RCD. Selecting the appropriate RCD is important for correct operation of the installation. An RCD with a rating of 30mA may actually trip at a leakage as 15mA (according to IEC 61008). High quality RCDs will typically trip at a value closer to their rating.

2.5 Surge Protection Devices (SPDs) for PV Installation**WARNING!**

- Over-voltage protection with surge arresters should be provided when the PV power system is installed. The storage inverters are equipped with SPDs on the PV input side as standard, in order to meet the secondary lightning protection requirements. The installation of an external SPD is determined based on local regulatory requirements.

3Product Introduction

3.1 Basic Features

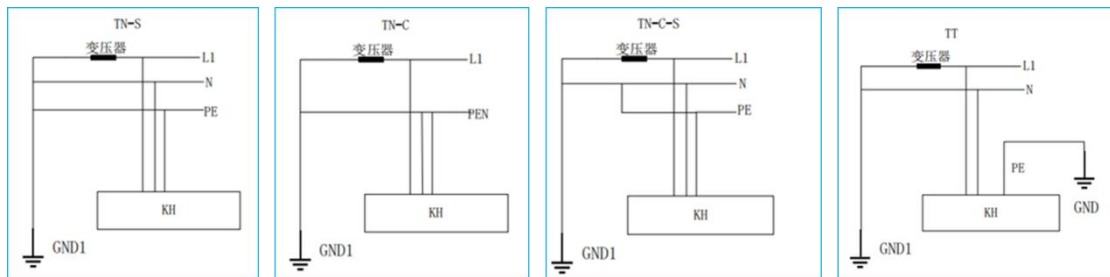
H1-G2-WL series are high-quality inverters which can convert solar energy to AC energy and store energy into battery. The inverter can be used to optimize self-consumption, store in the battery for future use or feed-in to public grid. Work mode depends on PV energy and user's preference.

Advantages	
	<ul style="list-style-type: none"> ✓ Advanced DSP control technology. ✓ Utilizes the latest high-efficiency power component. ✓ Advanced anti-islanding solutions. ✓ IP65 protection level. ✓ Max. Efficiency up to 97.8%; EU efficiency up to 97.0%; THD<3%. ✓ Safety & Reliability: Transformerless design with software and hardware protection. ✓ Export limitation (CT/Meter/DRM0/ESTOP). ✓ Power factor regulation. ✓ Friendly HMI. ✓ LED status indications. ✓ LCD display technical data, human-machine interaction through four touch keys. ✓ PC remote control.
Work modes	Description
Self-use (with PV Power)	Priority: load>battery>grid The energy produced by the PV system is used to optimize self-consumption. The excess energy is used to charge the batteries, then exported to grid.
Self-use (without PV Power)	When no PV supplied, battery will discharge for local loads firstly, and grid will supply power when the battery capacity is not enough.
Feed in priority	Priority: load>grid>battery In the case of the external generator, the power generated will be used to supply the local loads firstly, then export to the public grid. The redundant power will charge the battery.
Force time use	Priority: battery>load>grid (when charging) Priority: load>battery>grid (when discharging) This mode applies the area that has electricity price between peak and valley. User can use off-peak electricity to charge the battery. The charging and discharging time can be set flexibly, and it also allows to choose whether charge from the grid or not.
Back up mode	When the grid is off, system will supply emergency power from PV or battery to supply the home loads (Battery is necessary in EPS mode).

★Charging time is when the battery is charged within the set time range. The setting of charging time can be used in the above three modes.

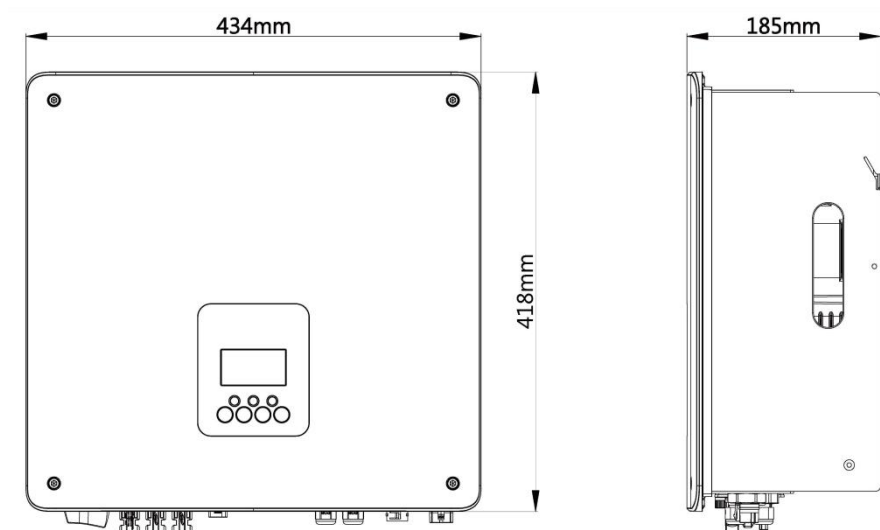
Grid Types Supported

The grid types supported by this product are TN-S, TN-C, TN-C-S and TT.

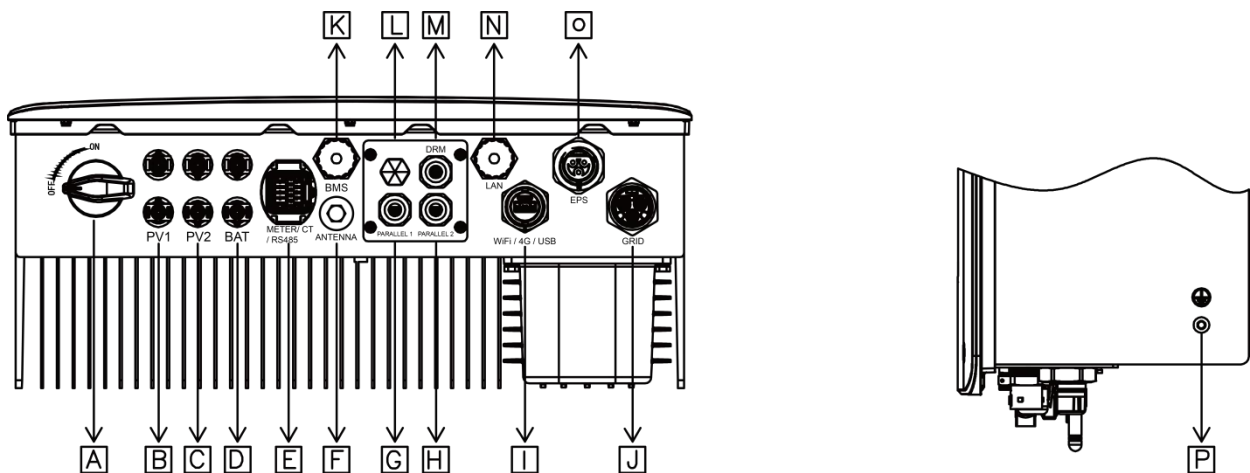


When the inverter is applied to TT grid, N to PE voltage requirement is less than 60V.

3.2 Dimensions



3.3 Terminals



No.	Description	No.	Description
A	DC Switch (For Hybrid Only)	I	WiFi / 4G / USB
B	PV1 (For Hybrid Only)	J	GRID
C	PV2 (For Hybrid Only)	K	BMS
D	Battery Connector	L	Waterproof Lock Valve
E	METER/CT/RS485	M	DRM
F	Antenna	N	LAN
G	PARALLEL 1	O	EPS
H	PARALLEL 2	P	Grounding Screw

- It is recommended to use the communication module produced by our company, using third party products may cause communication failure or even unknown damage.
- Note: Only authorized personnel are permitted to set the connection.

4 Technical Data

4.1 PV Input (For Hybrid Only)

Model	H1-2.5-E -G2-WL	H1-3.0-E -G2-WL	H1-3.7-E -G2-WL	H1-4.0-E -G2-WL	H1-4.6-E -G2-WL	H1-5.0-E -G2-WL	H1-6.0-E -G2-WL	H1-4.6-E1 -G2-WL	H1-5.0-E1 -G2-WL	H1-6.0-E1 -G2-WL
Max. PV array power [Wp]	5000	6000	7400	8000	9200	10000	12000	9200	10000	12000
Max. DC Input Power(PV1 +PV2) [W]	5000	6000	7400	8000	9200	10000	12000	9200	10000	12000
Max.MPPT input power(Per MPPT)	5000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Max. Input Voltage [V]	600									
Start-up Input Voltage [V]	75									
Rated Input Voltage [V]	360									
MPPT Operating Voltage Range [V]	80-550									
Max. Input Current [A]	16/16									
Max. Short-circuit Current [A]	20/20									
No. of Independent MPP Trackers	2									
No. of Strings per MPP Tracker	1									

4.2 Battery

Model	H1-2.5-E -G2-WL AC1-2.5- E-G2-WL	H1-3.0-E -G2-WL AC1-3.0- E-G2-WL	H1-3.7-E -G2-WL AC1-3.7- E-G2-WL	H1-4.0-E -G2-WL AC1-4.0- E-G2-WL	H1-4.6-E -G2-WL AC1-4.6- E-G2-WL	H1-5.0-E -G2-WL AC1-5.0- E-G2-WL	H1-6.0-E -G2-WL AC1-6.0- E-G2-WL	H1-4.6-E1 -G2-WL AC1-4.6- E1-G2-WL	H1-5.0-E1 -G2-WL AC1-5.0- E1-G2-WL	H1-6.0-E1 -G2-WL AC1-6.0- E1-G2-WL
Battery Type	Lithium-Ion battery (LFP)									
Battery Voltage [V]	80-480									
Max. Charge Current [A]	40									
Max. Discharge Current [A]	40									
Communication Interface	CAN									

4.3 AC Output/Input

Model	H1-2.5-E -G2-WL	H1-3.0-E -G2-WL	H1-3.7-E -G2-WL	H1-4.0-E -G2-WL	H1-4.6-E -G2-WL	H1-5.0-E -G2-WL	H1-6.0-E -G2-WL	H1-4.6-E1 -G2-WL	H1-5.0-E1 -G2-WL	H1-6.0-E1 -G2-WL
	AC1-2.5-	AC1-3.0-	AC1-3.7-	AC1-4.0-	AC1-4.6-	AC1-5.0-	AC1-6.0-	AC1-4.6-	AC1-5.0-	AC1-6.0-
	E-G2-WL	E-G2-WL	E-G2-WL	E-G2-WL	E-G2-WL	E-G2-WL	E-G2-WL	E1-G2-WL	E1-G2-WL	E1-G2-WL
AC OUTPUT										
Rated Output Power [W]	2500	3000	3680	4000	4600	5000	6000	4600	5000	6000
Max. Output Apparent Power [VA]	2750	3300	4048 /3680 ^[1]	4400	5060	5500	6600	4600	5000	6000
Rated Grid Voltage [V]	220/230/240									
Rated Grid Frequency [Hz]	50 / 60									
Rated Output Current (per phase) [A]	11.4	13.6	16.7/16 ^[2]	18.2	20.9	22.7	27.3	20.9	22.7	27.3
Max. Output Current [A]	12.5	15.0	18.4	20.0	23.0	25.0	30.0	20.9	22.7	27.3
Power Factor	1 (Adjustable from 0.8 leading to 0.8 lagging)									
THDI	<3%@ rated power									
AC INPUT										
Max. AC Input Power [VA]	3000	6000	7680	8000	9200	10000	12000	9200	10000	12000
Max. AC Input Current (per phase) [A]	13.6	27.3	34.9	36.4	41.8	45.5	54.5	41.8	45.5	54.5

4.4 EPS Output

Model	H1-2.5-E -G2-WL AC1-2.5- E-G2-WL	H1-3.0-E -G2-WL AC1-3.0- E-G2-WL	H1-3.7-E -G2-WL AC1-3.7- E-G2-WL	H1-4.0-E -G2-WL AC1-4.0- E-G2-WL	H1-4.6-E -G2-WL AC1-4.6- E-G2-WL	H1-5.0-E -G2-WL AC1-5.0- E-G2-WL	H1-6.0-E -G2-WL AC1-6.0- E-G2-WL	H1-4.6-E1 -G2-WL AC1-4.6- E1-G2-WL	H1-5.0-E1 -G2-WL AC1-5.0- E1-G2-WL	H1-6.0-E1 -G2-WL AC1-6.0- E1-G2-WL
EPS OUTPUT (WITH BATTERY)										
Max. Output Apparent Power [VA]	2500	3000	3680	4000	4600	5000	6000	4600	5000	6000
Peak Output Apparent Power (60s) [VA]	3000	3600	4400	4800	5500	6000	7200	5500	6000	7200
Max. Current (per phase) [A]	11.4	13.6	16.7	18.2	20.9	22.7	27.3	20.9	22.7	27.3
Rated Output Voltage [V]	220/230/240									
Rated Output Frequency [Hz]	50/60									
THDV (linear Load)	<2%@rated power									
Parallel Operation [Pcs]	10									
Switch Time [ms]	<20									

4.5 Efficiency, Safety and Protection

Model	H1-2.5-E -G2-WL	H1-3.0-E -G2-WL	H1-3.7-E -G2-WL	H1-4.0-E -G2-WL	H1-4.6-E -G2-WL	H1-5.0-E -G2-WL	H1-6.0-E -G2-WL	H1-4.6-E1 -G2-WL	H1-5.0-E1 -G2-WL	H1-6.0-E1 -G2-WL
	AC1-2.5- E-G2-WL	AC1-3.0- E-G2-WL	AC1-3.7- E-G2-WL	AC1-4.0- E-G2-WL	AC1-4.6- E-G2-WL	AC1-5.0- E-G2-WL	AC1-6.0- E-G2-WL	AC1-4.6- E1-G2-WL	AC1-5.0- E1-G2-WL	AC1-6.0- E1-G2-WL
EFFICIENCY										
MPPT Efficiency	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%
Euro Efficiency	95.26%	95.26%	95.70%	95.90%	96.23%	96.30%	96.33%	96.23%	96.30%	96.33%
Max. Efficiency	97.01%	97.01%	97.08%	97.08%	97.08%	97.08%	97.08%	97.04%	97.08%	97.08%
Max. Battery Charge Efficiency (PV to BAT) (@full load)	98.50%	98.50%	98.50%	98.50%	98.50%	98.50%	98.50%	98.50%	98.50%	98.50%
Max. Battery Discharge Efficiency (BAT to AC) (@full load)	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%
STANDARD										
Safety	EN 62109-1/ EN 62109-2									
EMC	EN 61000-6-2/ EN 61000-6-3									
Certification	EN50549-1, C10/11, VDE-AR-N 4105, G98, G99, CEI 0-21									
Protection										
Insulation Monitoring	YES									
Residual Current Monitoring	YES									
DC Reverse Polarity Protection	YES									

Anti-Island ing Protection	YES
AC Short-Circ uit Protection	YES
AC Overcurre nt /Overvolta ge Protection	YES
DC Switch	YES
Battery Wack-up Function	YES
SPD	DC: Type II, / AC: Type III
AFCI	optional

4.6 General Data

Dimensions (W*H*D) [mm]	434*418*185
Weight [kg]	22
Installation	Wall-mounted
Inverter topology	Non-Isolated
Cooling principle	Natural
Monitoring module	WiFi, LAN(optional) , 4G(optional)
Communication interface	RS485, DRM, Ripple Control, USB, CAN, LAN
Display	LCD, App, Website
ENVIRONMENT LIMIT	
Ingress protection	IP65
Protective class	Class I
Operating temperature range [°C]	-25..... +60°C (Derating at +45°C)
Storage/Operation relative humidity [%]	0 ~ 100 (non-condensing)
Altitude [m]	<2000
Storage temperature [°C]	-40..... +70°C
Noise emission(typical) [dB]	<35
Overvoltage category	III(AC), II(DC)
Standby consumption [W]	< 15
Warranty	10 years

5 Installation

5.1 Installation Precautions

Danger!

- Do not wear loose clothing or jewelry when performing installation work, otherwise there may be a risk of electric shock!
- Before carrying out installation work, make sure that the mechanical strength of the installation location is sufficient to support the weight of the equipment, otherwise a mechanical hazard may result.

Warning!

All jumper components and component-mounted racks must be properly grounded, with unpainted contact surfaces.

Please strictly observe the following safety tips during installation operations. Otherwise, personal injury or death may occur.

- Installation must be performed properly by a professional under conditions that follow all warning tips.
- Nickel-plated copper is recommended, but aluminum can also be used.
- Remove the oxide layer and apply a suitable antioxidant caulking mix before connecting the aluminum busbar.
- For ease of installation and maintenance, it is recommended that sufficient space be allowed around the equipment: adequate cooling airflow, required clearances, and space needed for cables and cable support structures.

5.2 Unpackaging

Note!

Please open the package in order and do not knock it violently!

The following items must be checked before and after opening the box:

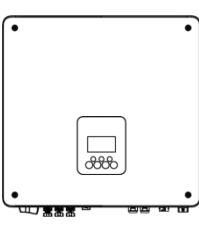
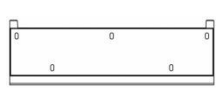
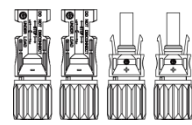
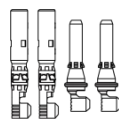
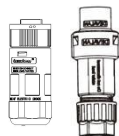
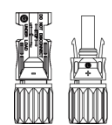
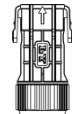
No.	Items
1	Check the appearance for any damage, scratches, dents, etc.
2	Check if all the accessories are included.
3	Check if the nameplate information matches the model of the ordered product.
4	Check the warning label for any damage, scratches, fading, etc.

Unpacking Precautions

- During storage, the packaging must not be removed. It should only be removed when the equipment is ready for installation.
- Before unboxing, inspect the product's external packaging for any issues such as damage, breakage, moisture, dampness, or deformation.
- During unboxing, check the product and its accessories for surface defects like damage, rust, or dents.

Packing List

When receiving the goods from the carrier, it is essential to conduct a thorough and careful inspection of the products. Check each received item against the delivery slip. If any items are missing or damaged, the carrier should be notified immediately upon discovery. The packing list is as shown below:

 <p>Inverter* 1</p>	 <p>Bracket* 1</p>	 <p>PV connectors* 4 (for hybrid only)</p>	 <p>PV pin contacts* 4 (for hybrid only)</p>
 <p>AC connectors* 2 (1*EPS, 1*GRID)</p>	 <p>Battery connectors* 2</p>	 <p>Battery pin contacts * 2</p>	 <p>Expansion tubes*5 & Expansion screws* 5</p>
 <p>Earth terminal* 1</p>	 <p>Communication connector* 1</p>	 <p>Quick installation guide*1</p>	 <p>CT* 1 (with 10m cable)</p>



5.3 Installation Requirements

Selecting the optimal installation location for the inverter plays a very important role in its safe operation, life assurance and performance guarantee.

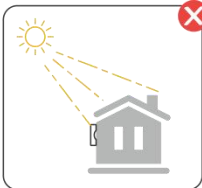
Environment Requirements

Warning!

The inverter generates high temperature during operation, so please install it in a location where it cannot be touched by human beings or isolate it by installing a protective net and erecting a safety warning sign on the outside.

Note!

Site selection should be in accordance with local laws and regulations and relevant standard requirements.

Items	Requirements
Location	<ul style="list-style-type: none"> ● Ensure adequate ventilation to allow free air flow for effective dissipation of heat generated during inverter operation. ● The air intake and outlet must be professionally protected against rain, windborne sand, and dust. ● Ensure there are no trees around the installation site to prevent branches or leaves from being blown by strong winds and obstructing the product door or air intake. ● Necessary measures for fire prevention, water protection, and rodent prevention must be in place. ● It should be located away from areas with concentrated toxic or hazardous gases. ● Keep away from flammable, explosive, and corrosive materials. ● It is strictly prohibited to install the equipment in areas prone to microbial growth, such as fungi or mold. ● Install away from areas with strong vibration, high noise sources, and strong electromagnetic interference, such as large transformers and high-voltage power lines. ● Locate away from noise-sensitive areas (e.g., residential, office, and school zones). If installation in such areas is unavoidable, the installation site must be at least 40 meters away from the noise-sensitive area, and noise reduction measures must be implemented. ● Do not install the equipment outdoors in salt-affected areas because it may be corroded. A salt-affected area refers to the region within 1000 m of the coast or prone to sea breeze. Regions prone to sea breeze vary with weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills). ● It should ideally be installed in an environment with low dust levels, low humidity, and no condensation to prevent dust and moisture from entering the inverter, which could affect its performance and lifespan. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>No direct sunlight</p> </div> <div style="text-align: center;">  <p>No rain exposure</p> </div> <div style="text-align: center;">  <p>Direct sunlight</p> </div> <div style="text-align: center;">  <p>Rain exposure</p> </div> </div>
Space	Sufficient space must be reserved on all sides (front, rear, left, right) and above the equipment for heat dissipation, maintenance, and emergency evacuation.
Altitude	2000m
Temperature	-25°C ~ +60°C
Relative Humidity	0%~95%

⚠ Warning!

The intrusion of moisture can easily cause damage to the equipment! For normal use of the equipment:

- Do not open the cabinet door when the air humidity exceeds 95%.
- Avoid opening the cabinet door, performing maintenance or overhauling, etc., in rainy, lightning or humid weather conditions.

Installation Surface Requirements**⚠ Warning!**

Mounting the inverter on a wall that does not meet the specified conditions may cause equipment damage. Any resulting damage will not be covered under the warranty.

Requirements for the Wall

The wall used for mounting the inverter must meet the following conditions:

- It must be a solid brick/concrete surface or a surface of equivalent strength, and must be capable of bearing the weight.
- If the wall lacks sufficient strength (e.g., column walls or walls with thick decorative coverings), the inverter must be properly supported or reinforced.
- It is strictly prohibited to install the inverter on flammable surfaces or surfaces prone to resonance.
- It should be installed on a wall with good sound insulation to reduce the impact of operational noise.

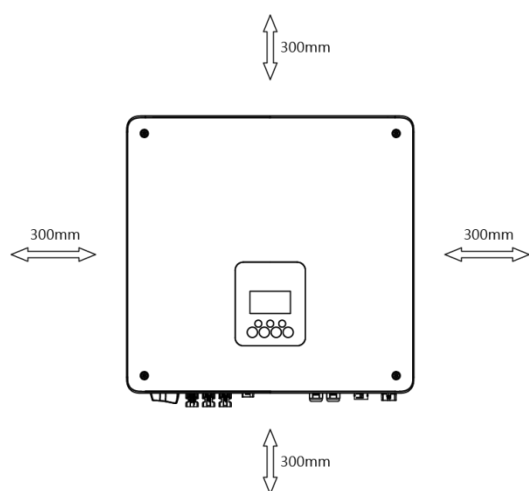
Requirements for Foundation

The foundation for the inverter must meet the following conditions:

- The installation surface must be flat, dry, and must be free of standing water.
- Ensure the ground is level, stable (without shaking), and can support the equipment's weight.
- If installed in an area with abundant vegetation, in addition to routine weeding, the ground beneath the equipment must be hardened (e.g., by laying concrete, gravel, etc.) over an area of no less than 3m × 2.5m.

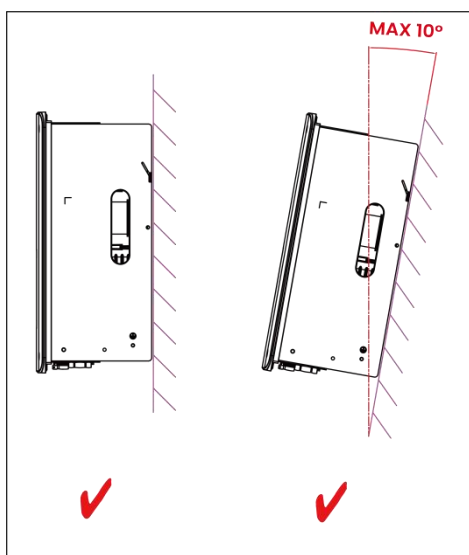
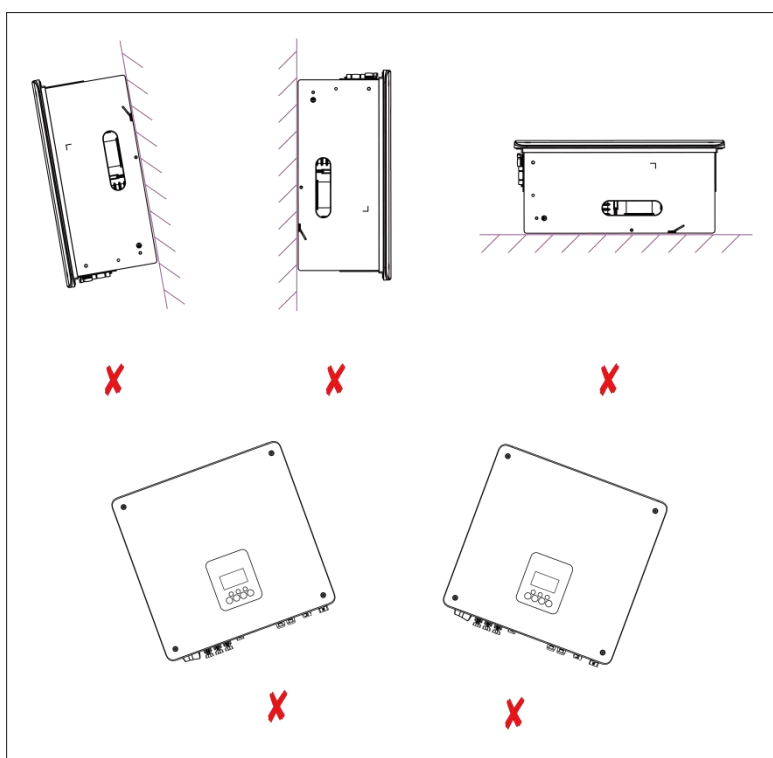
Requirements for Space

Adequate space must be reserved around the inverter, and a suitable installation angle must be selected to ensure sufficient room for installation and heat dissipation. The specific space requirements for a single inverter are illustrated in the following diagram.



Position	Min. space (mm)
Left	300
Right	300
Top	300
Bottom	300

Requirements for Angle



Warning!

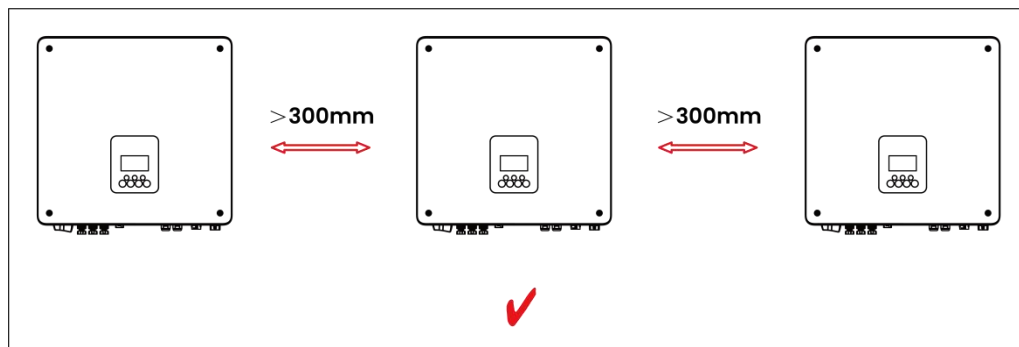
The wall inclination must be within $\pm 5^\circ$.

Multiple Inverter Installation

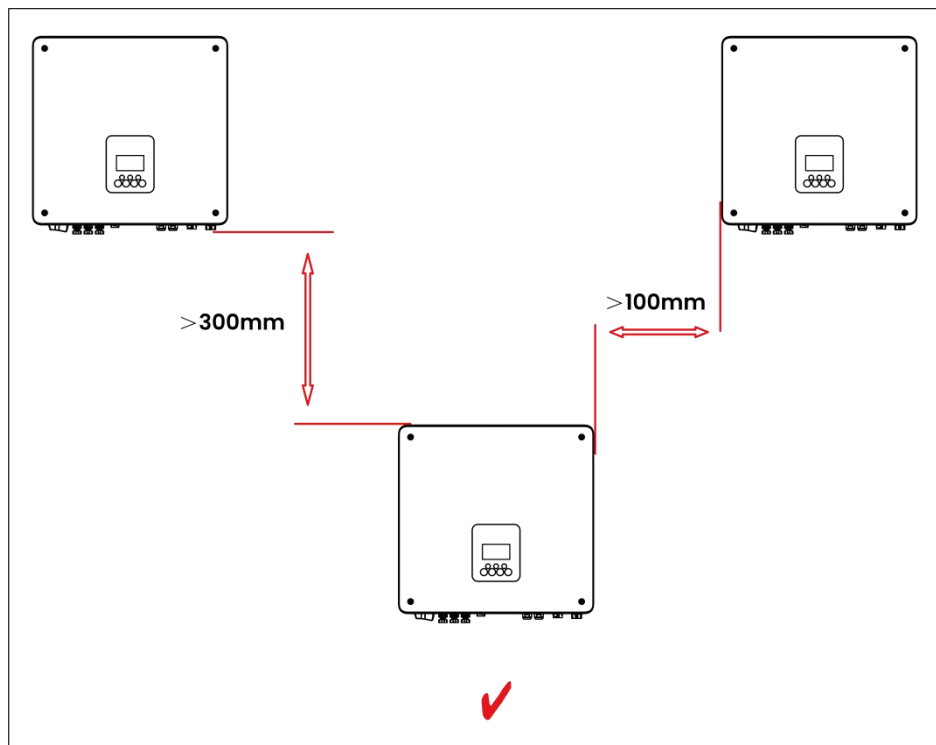
Note!

When installing multiple units, an in-line arrangement is recommended where space permits. If space is limited, a staggered (triangular) arrangement is advised. Vertical stacking of multiple inverters is not recommended.

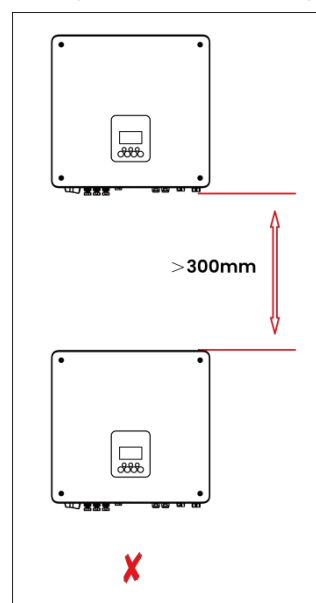
In-line arrangement of multiple inverters (recommended)



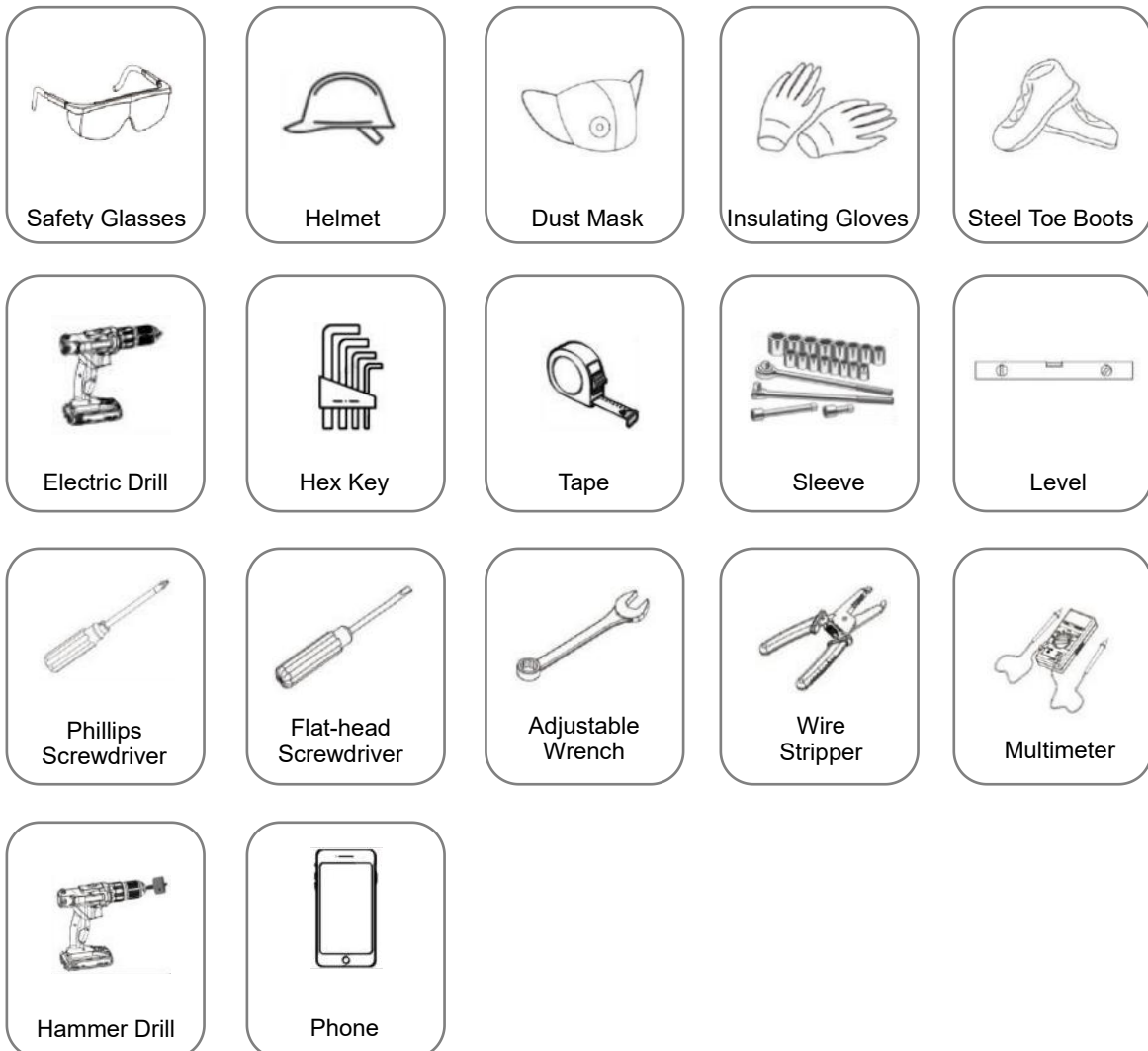
Staggered (triangular) arrangement of multiple inverters (recommended)



Vertical stacking of multiple inverters (not recommended)



5.4 Tools Preparation



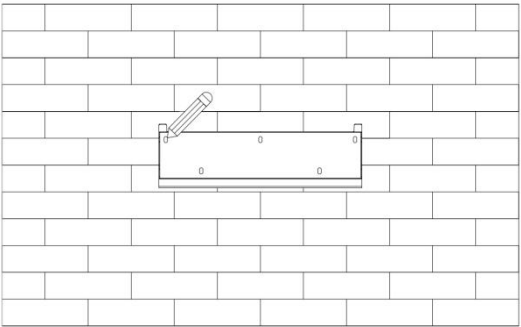
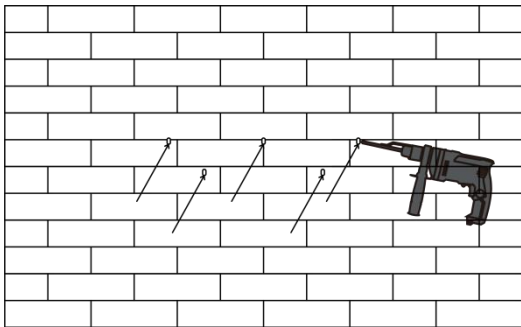
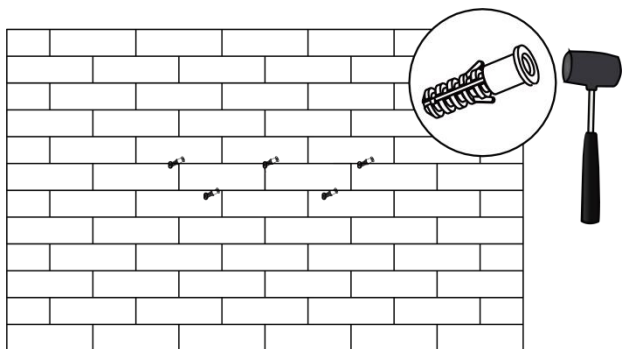
5.5 Inverter Handling

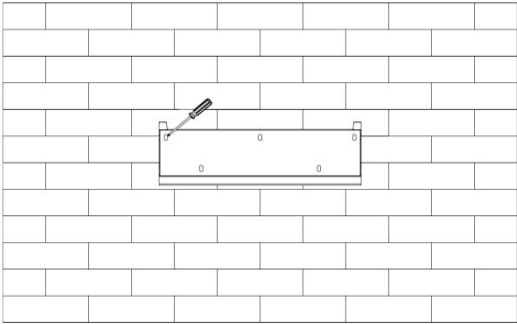
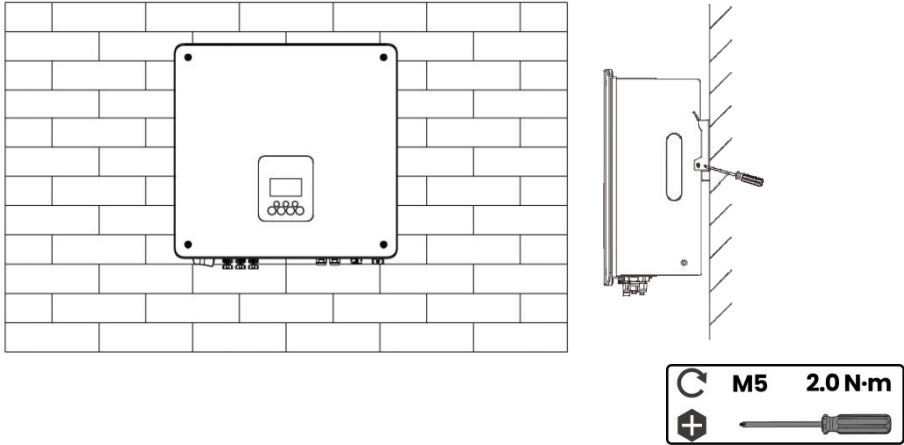
- When manually handling the unit, wear protective gloves, safety shoes, and other personal protective equipment to prevent injury during the process.
- Use correct lifting posture: Bend your knees to lower your center of gravity, grasp the inverter handles with both hands, and slowly straighten your knees, using the strength of your legs to lift the load. Keep the load close to your body and move using short, quick steps.
- Always maintain body balance during handling. Avoid making sudden turns or changes in direction.
- If a turn is necessary, execute it slowly and adjust your body posture in advance.
- If you feel fatigued or lack sufficient strength, you must stop handling immediately.

Warning!

Do not jerk or twist your body using the strength of your lower back, as this can lead to injury.

5.6 Installation Steps

Procedures	
Step 1	Choose the installation site for the inverter, ensuring to avoid concealed water pipes and electrical wiring within the wall to prevent any hazards.
Step 2	<p>Position the mounting bracket against the wall and mark the locations of all 5 screw holes.</p> 
Step 3	<p>Using an electric drill, create holes with a minimum depth of 50mm and a minimum diameter of 8mm. It is recommended to apply anti-rust paint to the drilled holes for protection.</p> 
Step 4	<p>Insert the expansion tubes into the drilled holes in the wall.</p> 

<p>Step 5</p>	<p>Insert the expansion tubes into the holes and tighten them. Install the bracket with the expansion screws.</p> 
<p>Step 6</p>	<p>Hang the inverter over the bracket, slightly lower the inverter, and make sure the 2 grooves on the back are fixed with the 2 mounting bars from bracket properly. Fixing inverter with the supplied M5 screw.</p> 

⚠ Warning!

Operators should wear protective goggles and dust masks to prevent dust from being inhaled into the lungs or falling into the eyes when punching.

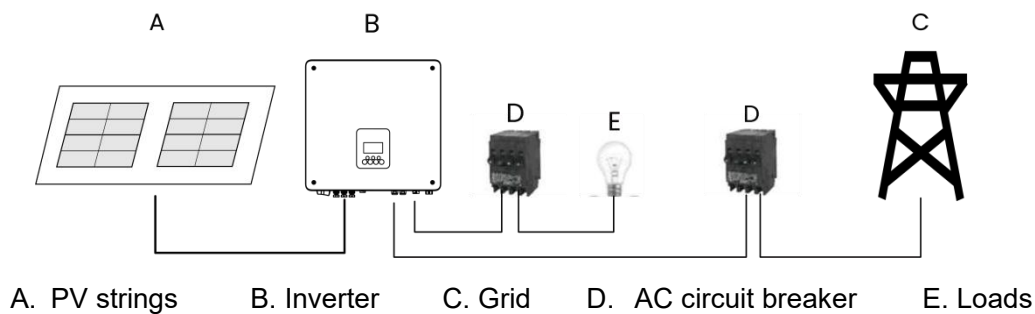
Note!

The upper face of the expansion tubes must be made sure that it is level with the concrete wall surface and does not protrude from the concrete wall surface, otherwise it will make the wall plate unevenly placed on the wall surface.

6 Electrical Connection

6.1 Electrical Connection Overview

This series of inverters is designed for use with single-phase power grids. They are suitable for grids with a rated voltage of 220/230V and a frequency of 50/60Hz. All other technical specifications must comply with the requirements of the local public grid.



The cable colors shown in all electrical connection diagrams within this section are for reference only.

6.2 External Protective Earthing

⚠ Danger!

The protective earth wire needs to remain grounded during installation and when removing the equipment.

Note!

The grounding resistance should comply with relevant standards and regulations to ensure effective current discharge. Normally, the value of the earth resistance should be small enough to ensure that the current can be rapidly conducted to earth in the event of a fault.

- Grounding connections must be secure and reliable to avoid loosening, corrosion, or poor contact. Appropriate anti-corrosion treatment should be applied at connection points.
- The entire grounding system, including the grounding electrode, main grounding conductor, branch conductors, and connections to equipment, must be maintained intact.
- The grounding system should undergo periodic inspection and testing, checking ground resistance and connection integrity. Ensure the equipment is reliably grounded before operation, and promptly identify and repair any damage or abnormalities.

- Strictly adhere to national and industry-specific electrical wiring standards and codes during construction and installation.

Grounding Terminal Requirements

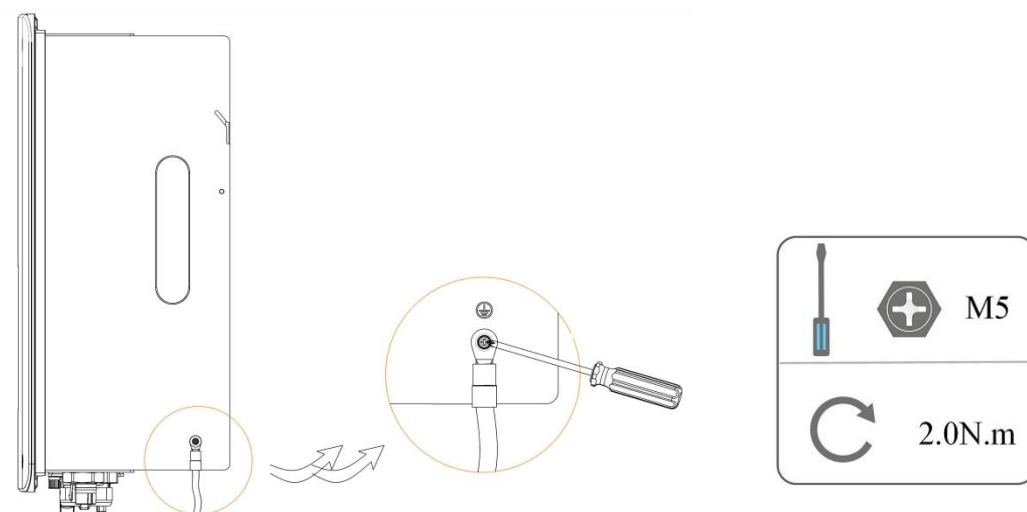
Material	Cross-Sectional Area (mm ²)	External Protective Grounding Terminal & AC Side Grounding Terminal
Copper	≥ 10	Simultaneous grounding is recommended.
Aluminum	≥ 16	Simultaneous grounding is recommended.
Copper	≥ 10	Simultaneous grounding is mandatory.
Aluminum	≥ 16	Simultaneous grounding is mandatory.

If alternative grounding methods comply with local standards and relevant safety codes, they may be implemented accordingly. The company assumes no liability for any consequences that may arise therefrom.

Grounding Cable Requirements

Cross-sectional area of PE conductor	Description
Half of the phase conductor	This requirement applies only when the PE conductor and the phase conductor are of the same material. If the materials differ, the PE conductor must possess an equivalent conductivity matching the specification in the table.

Grounding Procedures



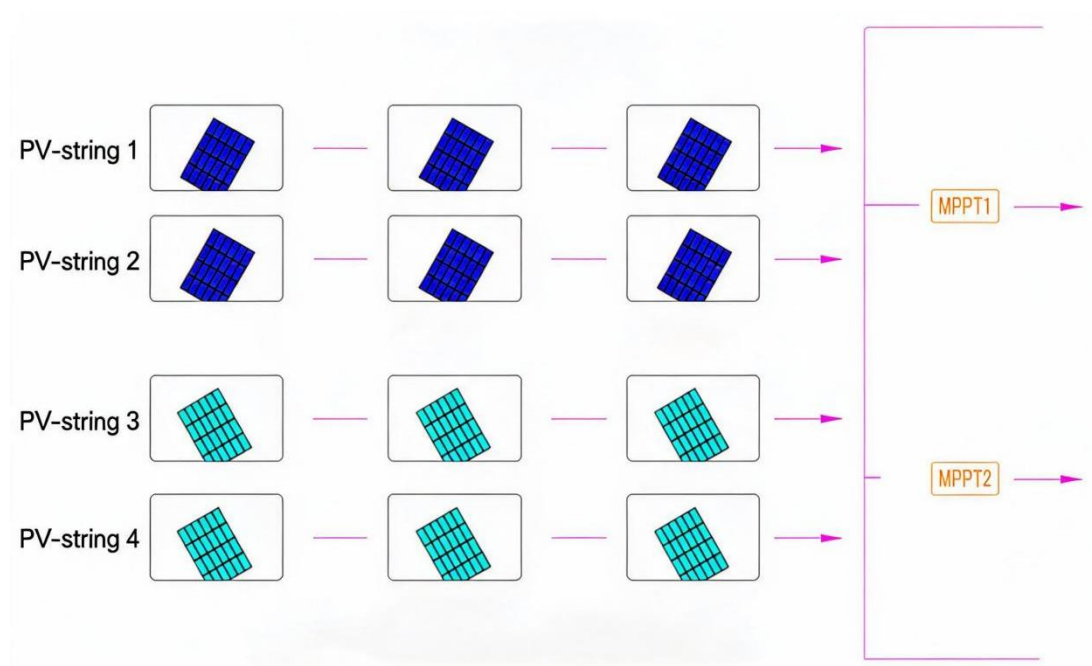
6.3 DC Connection

H1-G2-WL Series Inverters can be connected with 2-strings of PV modules. Please select suitable PV modules with high reliability and quality. Open circuit voltage of module array connected should be less than 600V, and operating voltage should be within the MPPT voltage range.

PV Input Configuration

As shown in the figure below, the inverter features multiple PV inputs, with each input equipped with an independent MPP tracker.

- Each PV input operates independently, with its own dedicated MPPT. The PV strings connected to different inputs can have different configurations, including panel type, number of panels per string, tilt angle, and azimuth.
- Each MPPT can accommodate up to 2 PV strings. To maximize the power output of the PV panels, ensure that all modules within the same system are of the same type, have identical output characteristics and specifications, and share the same tilt angle.



Before connecting the PV inputs to the inverter, ensure the following electrical parameter requirements are met:

Maximum Open-Circuit Voltage per Input	Maximum Allowable Current per Input Terminal
600 V	20 A

⚠ Danger!

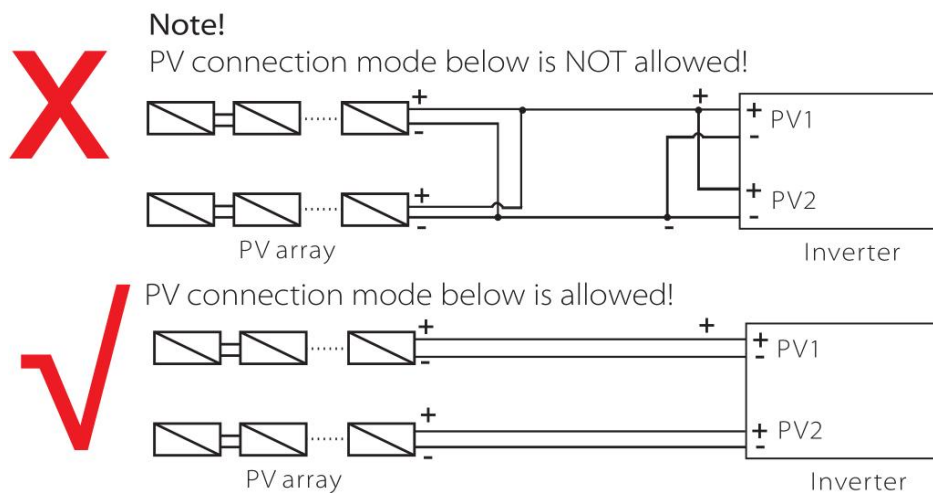
Do not ground the PV positive or negative terminal.

⚠ Warning!

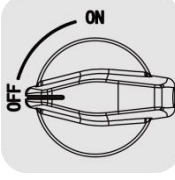
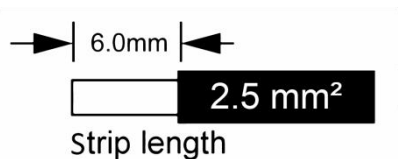
PV modules produce high voltage, which is within the hazardous voltage range. Always adhere to electrical safety rules during connection.

Note!

If the inverter does not have a built-in DC switch, select a suitable external DC switch. To save on cable costs and reduce DC power losses, it is recommended to install the inverter as close to the PV modules as possible.

**Cable specifications**

It is recommended to use 2.5mm² PV-specific DC cables for connecting PV modules.

Procedures	
Step 1	Turn off the DC switch.
	
Step 2	Choose 2.5 mm ² wire to connect the PV module. Trim 6mm of insulation from the wire end.
	 <p>Strip length</p>

Step 3	Separate the DC connector (PV) as below.
Step 4	Insert striped cable into pin contact and ensure all conductor strands are captured in the pin contact.
Step 5	Crimp pin contact with crimping pliers. Put the pin contact with striped cable into the corresponding crimping pliers and crimp the contact.
	<p>Attention! Reserved for locking. Do not crimp.</p>
Step 6	Insert pin contact through the cable nut to assemble into back of the male or female plug. When you feel or hear a "click" the pin contact assembly is seated correctly.

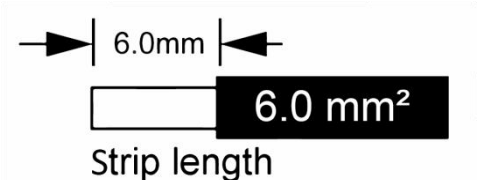
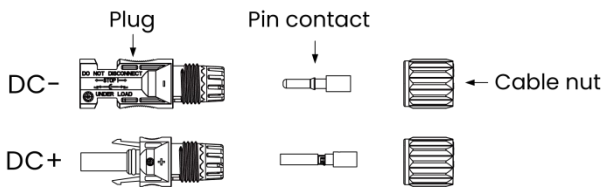
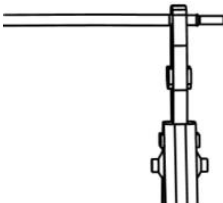
Unlock the DC connector:

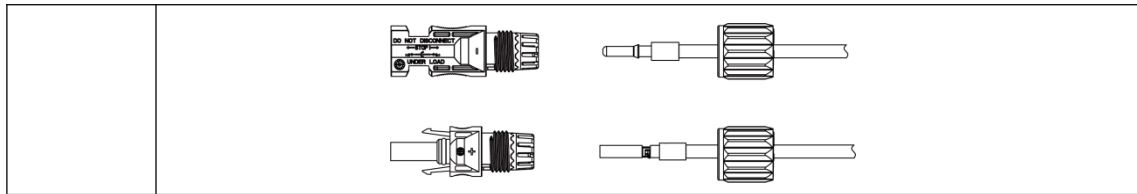
- Use the specified wrench tool.
- When separating the DC + connector, push the tool down from the top.
- When separating the DC - connector, push the tool down from the bottom.
- Separate the connectors by hand.

⚠ Warning!

Ensure that the power cable connected to the inverter is connected vertically and that the vertical length is greater than 30 cm. If the cable is bent close to the terminals, this may result in poor line contact and burn the terminals.

6.4 Battery Connection

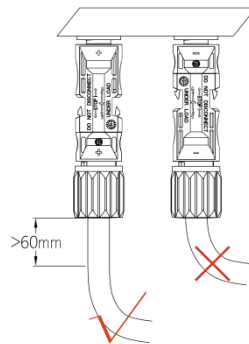
Procedures	
Step 1	Choose 6.0 mm ² wire to connect the battery.
Step 2	<p>Trim 6mm of insulation from the wire end.</p>  <p>Strip length</p>
Step 3	<p>Separate the DC connector (battery) as below.</p> 
Step 4	Insert striped cable into pin contact and ensure all conductor strands are captured in the pin contact.
Step 5	<p>Crimp pin contact with crimping pliers. Put the pin contact with striped cable into the corresponding crimping pliers and crimp the contact.</p> 
Step 6	Insert pin contact through the cable nut to assemble into back of the male or female plug. When you feel or hear a "click" the pin contact assembly is seated correctly.



Unlock the DC connector:

- Use the specified wrench tool.
- When separating the DC + connector, push the tool down from the top.
- When separating the DC - connector, push the tool down from the bottom.
- Separate the connectors by hand.

In order to avoid the cable bend force lead to a visible deformation in the sealing portion of the insulation, the cable need keep at least 60mm straight length.



6.5 AC Connection

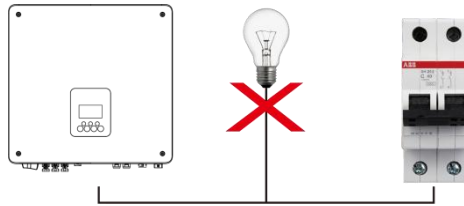
H1-G2-WL series inverters are designed for single-phase grid. Per voltage range is 220/230/240V; frequency is 50/60Hz. Other technical requests should comply with the requirement of the local public grid.

Table1: With EPS Function (Internal)

	Model (kW)	2.5	3.0~4.6	5.0~6.0
GRID	Cable	4.0-6.0 mm ²	10.0 mm ²	10.0 mm ²
	Micro-Breaker	16A	50A	63A
EPS	Cable	4.0 mm ²	4.0 mm ² / 6.0 mm ²	4.0 mm ² / 6.0 mm ²
	Micro-Breaker	16A	32A	32A

Table2: Without EPS Function (External)

	Model (kW)	2.5	3.0~4.0	4.6~6.0
GRID	Cable	2.5 mm ² / 4.0 mm ²		4.0 mm ² / 6.0 mm ²
	Micro-Breaker	16A	25A	32A

**Note!**

1. If you don't use the EPS function, the wiring conduct core section can refer to the parameters of table 1.
2. If you use the EPS function, the wiring conduct core section can refer to the parameters of table 2.

⚠ Warning!

A micro-breaker for max output over-current protection device shall be installed between inverter and grid, and the current of the protection device is referred to the table above, any load **SHOULD NOT** be connected with the inverter directly.

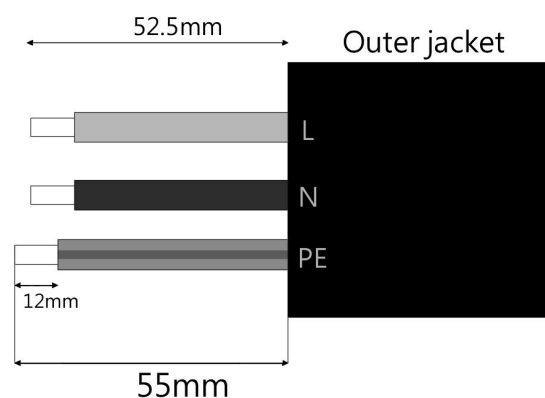
6.5.1 AC Wiring

Check the grid voltage and compare with the permitted voltage range (refer to technical data).

Disconnect the circuit-breaker from all the phases and secure against re-connection.

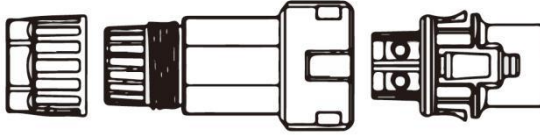
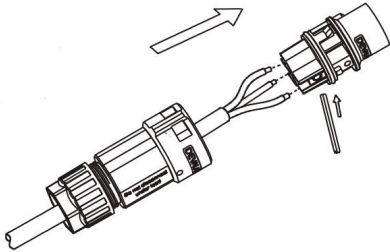
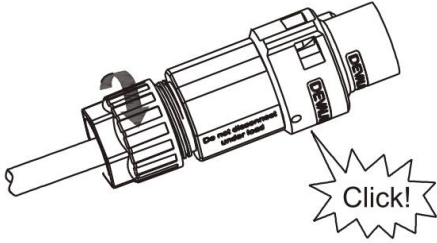
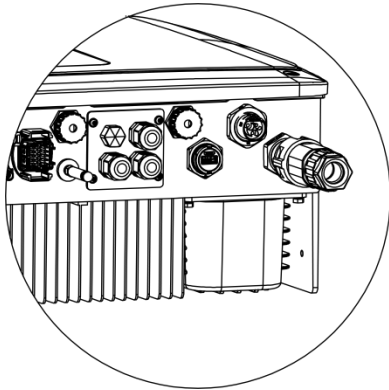
Trim the wires:

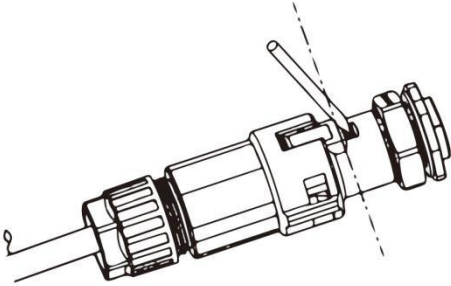
- Trim all the wires to 52.5mm and the PE wire to 55mm.
- Use the crimping pliers to trim 12mm of insulation from all wire ends as below.



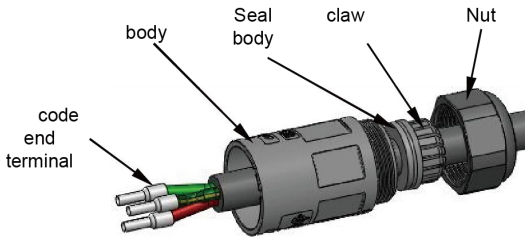
Wires	Colors
L	Brown/Red Wire
N	Blue/Black Wire
PE	Yellow & Green Wire
Note: Please refer to local cable type and color for actual installation.	

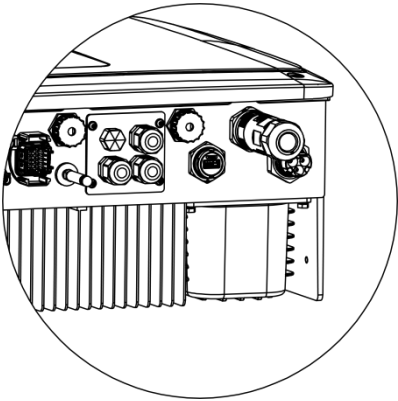
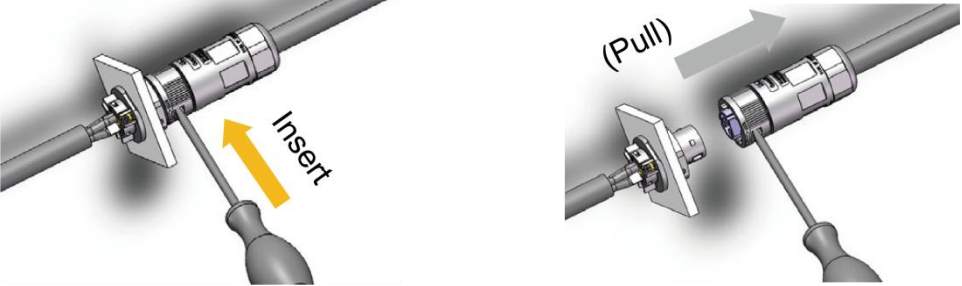
6.5.2 GRID Wiring

Procedures	
Step 1	<p>Separate the ON-GRID plug into three parts as below.</p> <ul style="list-style-type: none"> - Hold middle part of the female insert, rotate the back shell to loosen it, detach it from female inset. - Remove the cable nut (with rubber insert) from the back shell.
	
Step 2	<p>Slide the cable nut and then the back shell onto the cable. Install the cable into the plug terminal and lock the screw, torque is (2.0+/-0.2 N.m).</p>
	
Step 3	<p>Push the threaded sleeve into the socket, tighten up the cap on the terminal.</p>
	
Step 4	<p>Push the threaded sleeve to connection terminal until both are locked tightly on the inverter.</p>
	

Step 5	Remove the ON-GRID connector: Press the bayonet out of the slot with a small screwdriver or the unlock tool and pull it out, or unscrew the threaded sleeve, then pull it out.
	

6.5.3 EPS Wiring

Procedures	
Step 1	Run the cable into the sleeve assembly.
	
Step 2	Install the cable into the plug terminal and lock the screw, torque is $(0.8 \pm 0.1 \text{ N}\cdot\text{m})$.
	
Step 3	Insert the plastic core into the main body.
	
Step 4	Put the sealing body and yarn trapper into the main body, screw the lock nut into the main body, and the torque is $(2.5 \pm 0.5 \text{ N}\cdot\text{m})$.

	
Step 5	<p>Insert the male end into the female end. For the rotation direction of the lock, please refer to the LOCK mark on the assembly.</p>
	
Step 6	<p>Push the threaded sleeve to connection terminal until both are locked tightly on the inverter.</p>
	
Step 7	<p>Remove the EPS connector: press the connector unlock with a small screwdriver or the unlock tool and pull it out.</p>
	

6.6 Electrical Connection

6.6.1 Communication Device (optional)

The H1-G2-WL series inverters have a variety of communication device options such as WiFi, LAN, 4G, RS485, meters and external devices. The inverter's output voltage, current, frequency, fault information and other operating information can be monitored locally or remotely through these interfaces.

6.6.2 WiFi/LAN/4G (optional)

The inverter has an interface to a WiFi/LAN/4G device that allows the device to collect information from the inverter, including the inverter's operating status, performance, etc., and update this information to the monitoring platform (WiFi/LAN/4G devices can be purchased from local vendors).

Connection steps:

Step 1 Plug the WiFi/LAN/4G device into "WiFi/LAN/4G" port at the bottom of the inverter.

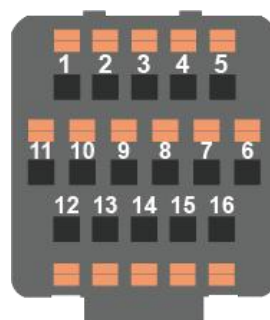
Step 2 For WiFi device: Connect the WiFi with the local router, and complete the WiFi configuration (please refer to the WiFi product manual for more details).

Step 3 Set-up the site account on the Fox ESS monitoring platform (please refer to the monitoring user manual for more details).

Meter/CT/RS485

The inverter has integrated export limitation functionality. To use this function, a power meter or a CT must be installed.

The PIN definitions of Meter/CT/485 interface are as below.



PIN	1	2	3	4	5	6	7	8
Definition	Meter485A	Meter485B	EMS 485B	EMS 485A	CT2+	CT2-	CT1-	CT1+

PIN	9	10	11	12	13	14	15	16
Definition	/	K1	K2	K3	K4	/	DI	COM

- CT1: For Hybrid/AC.
CT2: Grid tied inverter (if have).
- Compatible Meter type: DDSU666 (CHINT), SDM230 (EASTRON).

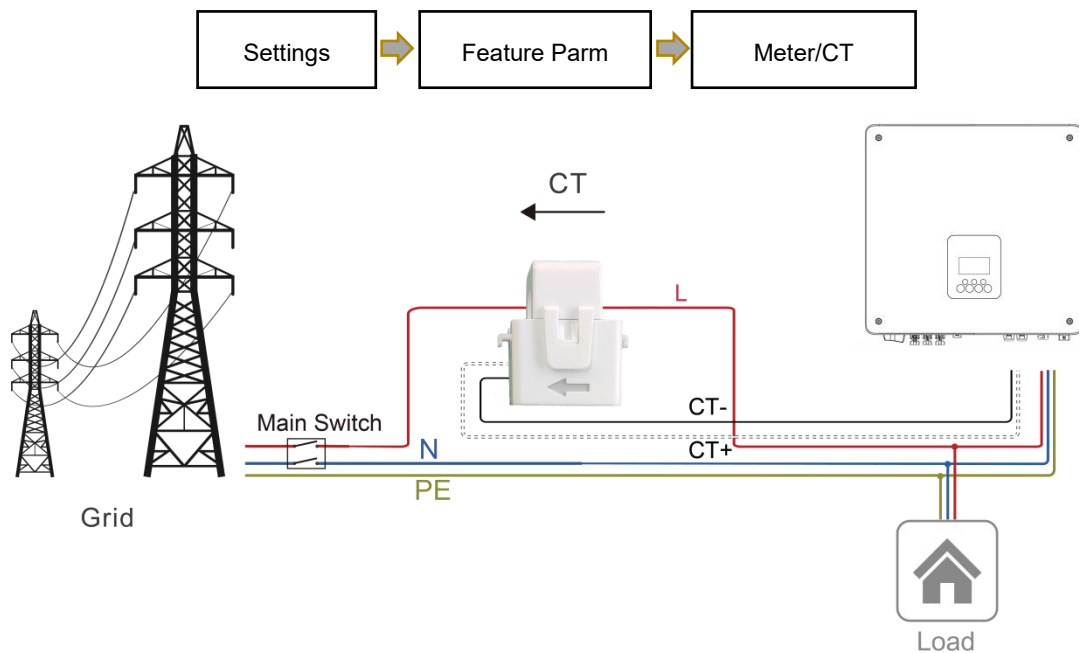
- CT

This inverter has an integrated export management function. To enable this function, a power meter or CT must be installed. The CT should be clamped on the main live line of the grid side. The arrow on the CT should be pointing towards the grid. The white cable connects to CT+, and the black cable connects to CT-.

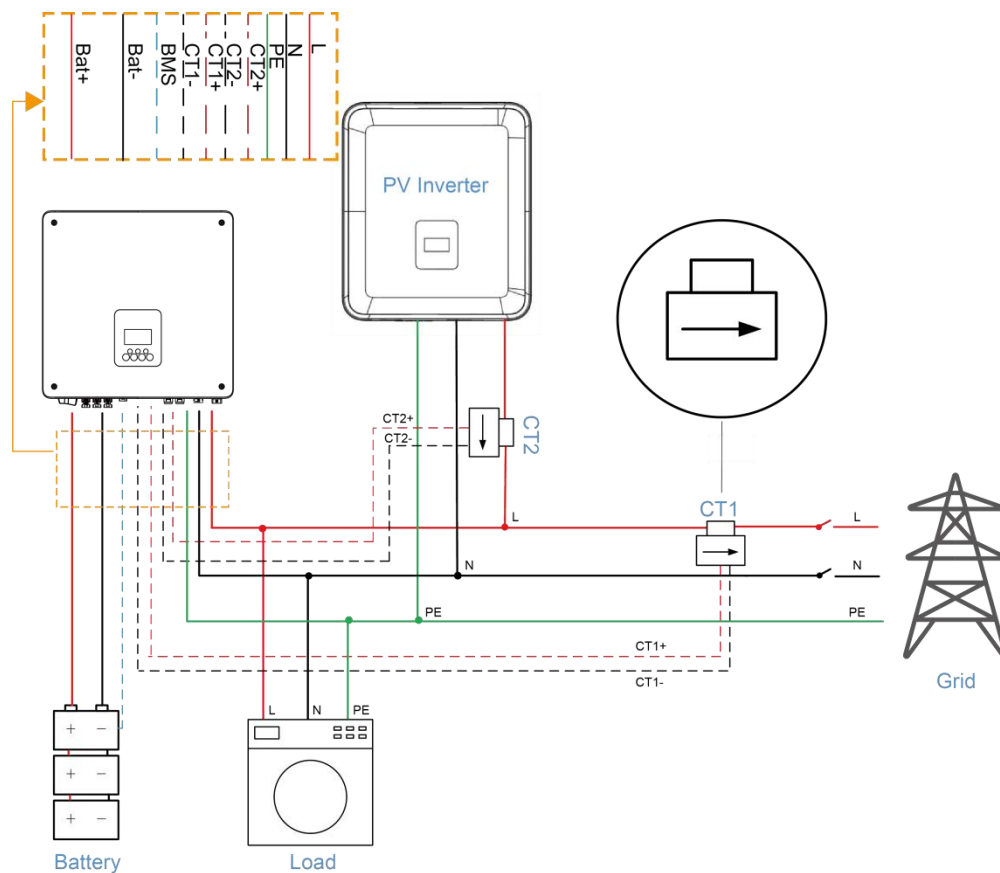
6.6.3 Meter/CT Setting

Short press the touch key to switch display or make the number+1.

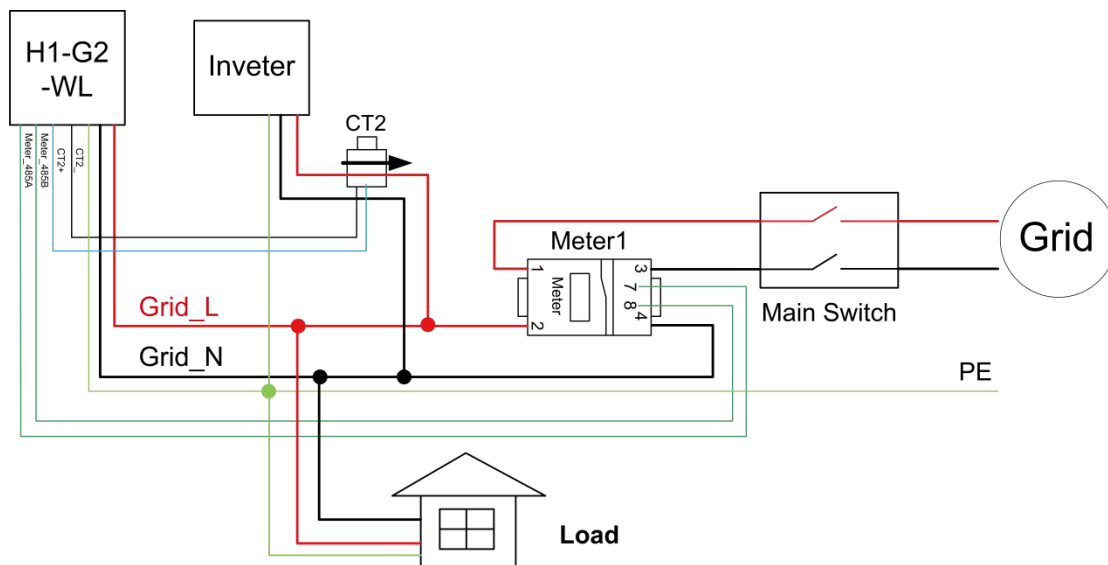
Long press the touch key to confirm your setting.



If there is another generator in the home, CT2 can be used to record the power generated by the generator and transmit the data to the website for monitoring.

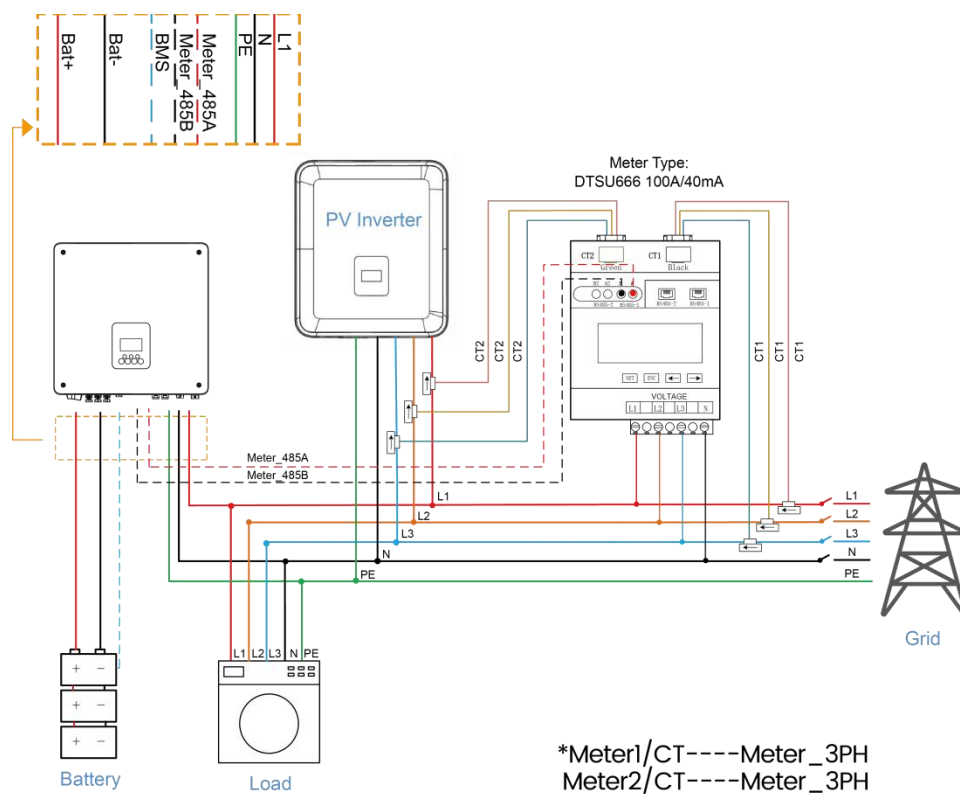


Wiring diagram for solution Meter1+CT2:

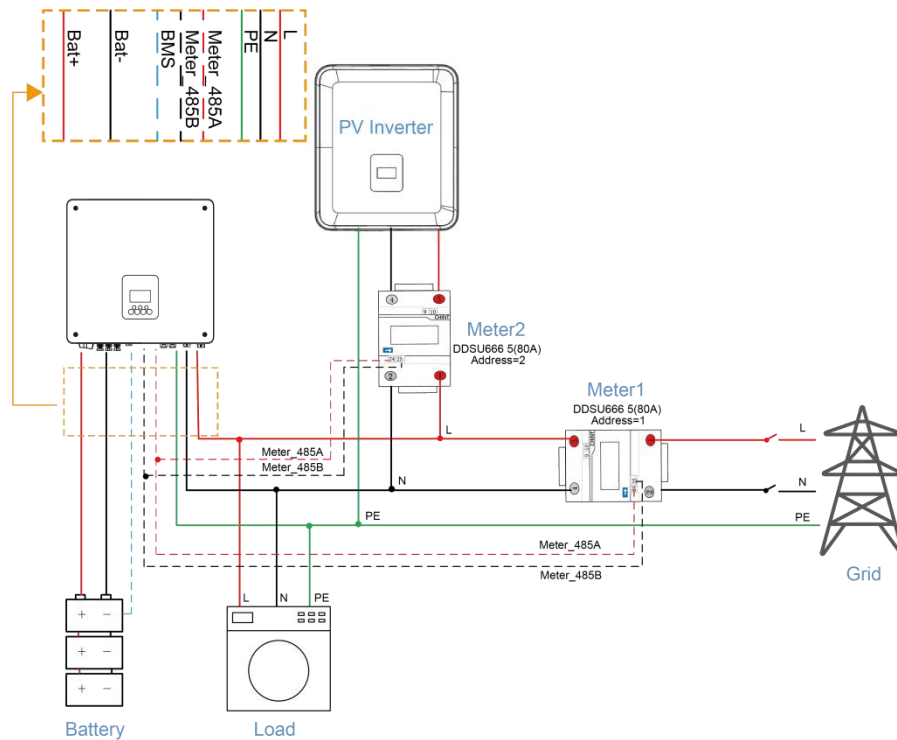


Caution: Please do the wiring strictly according to the diagram below, do not exchange Meter1 and Meter2 location in following dual-meter wiring solution, or may lead to unpredictable malfunction in data-recording. You can discern Meter1 or Meter2 from the package of the Meter. Default Modbus address for Meter1 is 1, default Modbus address for Meter2 is 2.

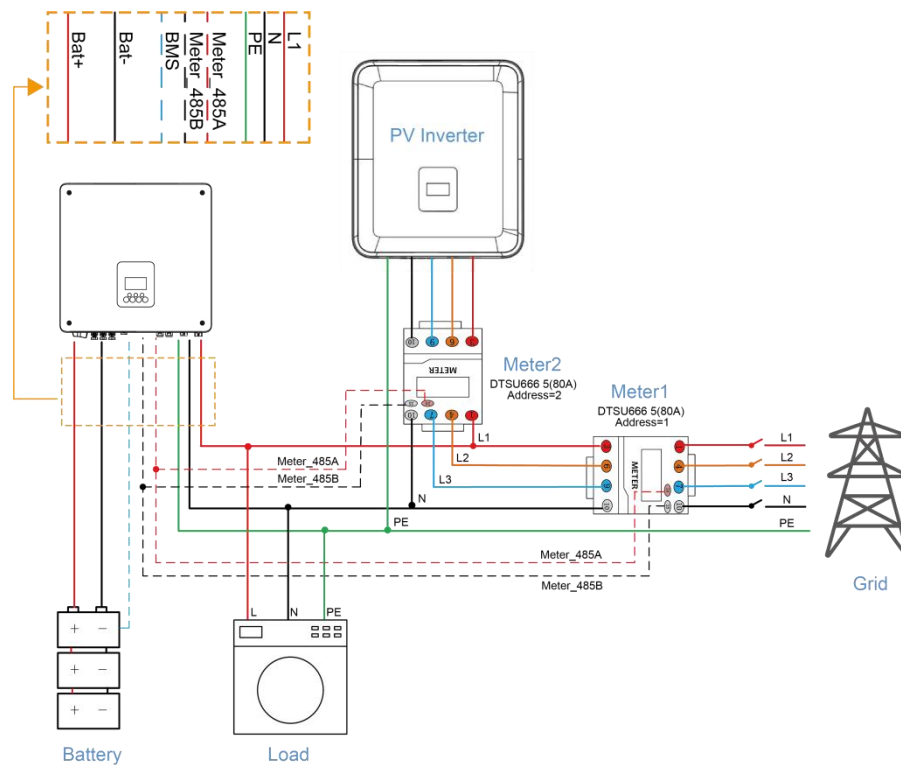
Wiring diagram for solution Meter+ 6CTs:



Wiring diagram for solution Meter1+Meter2(single phase):



Wiring diagram for solution Meter1+Meter2(three phase):



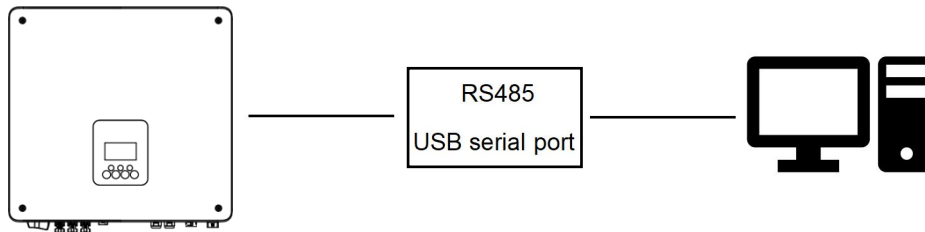
Note!

For a precise reading and control of power, a meter can be used instead of a CT. If the CT is fitted in the wrong orientation, anti-backflow function will fail.

6.6.4 RS485

RS485 is a standard communication interface which can transmit the real time data from inverter to PC or other monitoring devices.

Communication system of single inverter



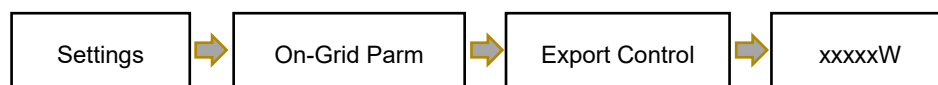
6.6.5 Meter (optional)

The inverter has integrated export limitation functionality. To use this function, a power meter or a CT must be installed. For Meter installation, please install it on the grid side.

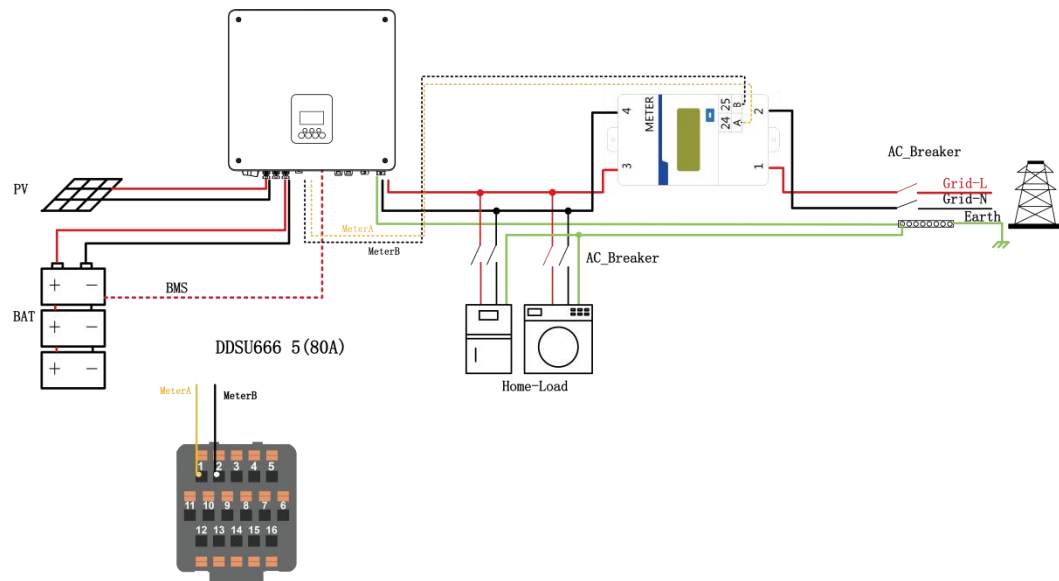
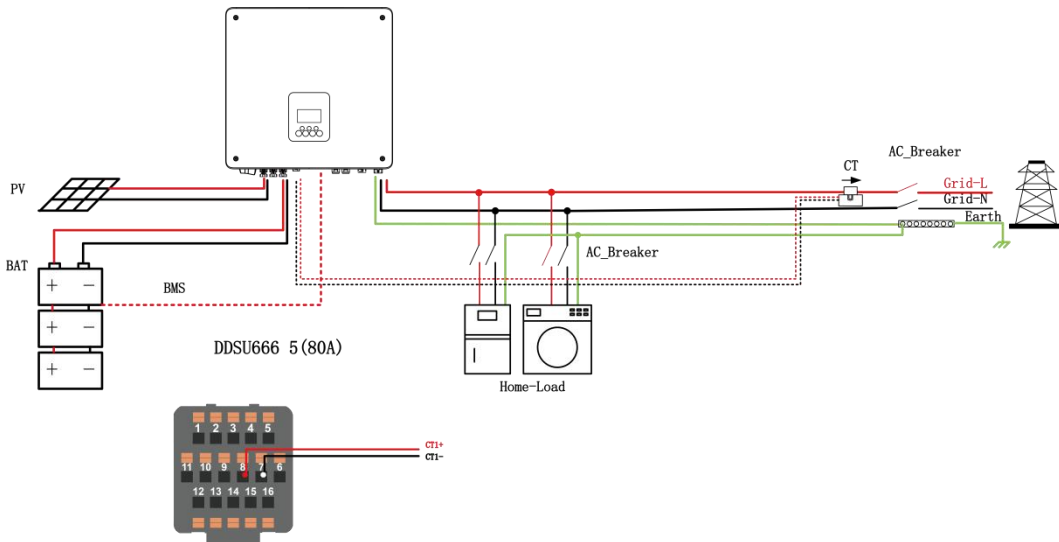
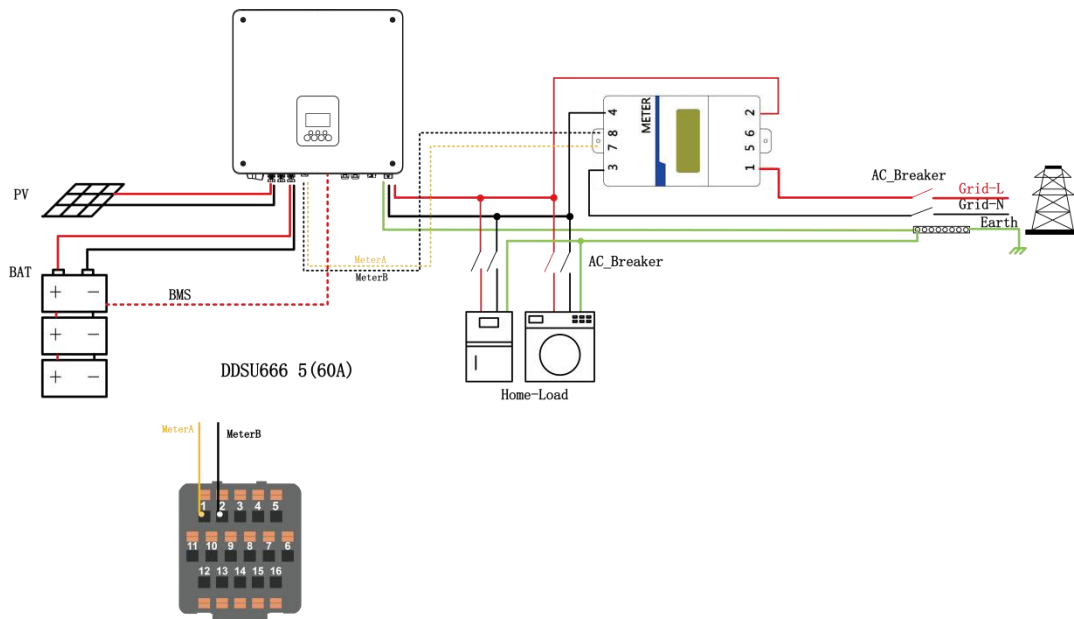
Meter model	Factory	Current	Frequency
SDM230-Modbus	EASTRON	0.5%	0.2%
DDSU666	CHINT	1%	1%

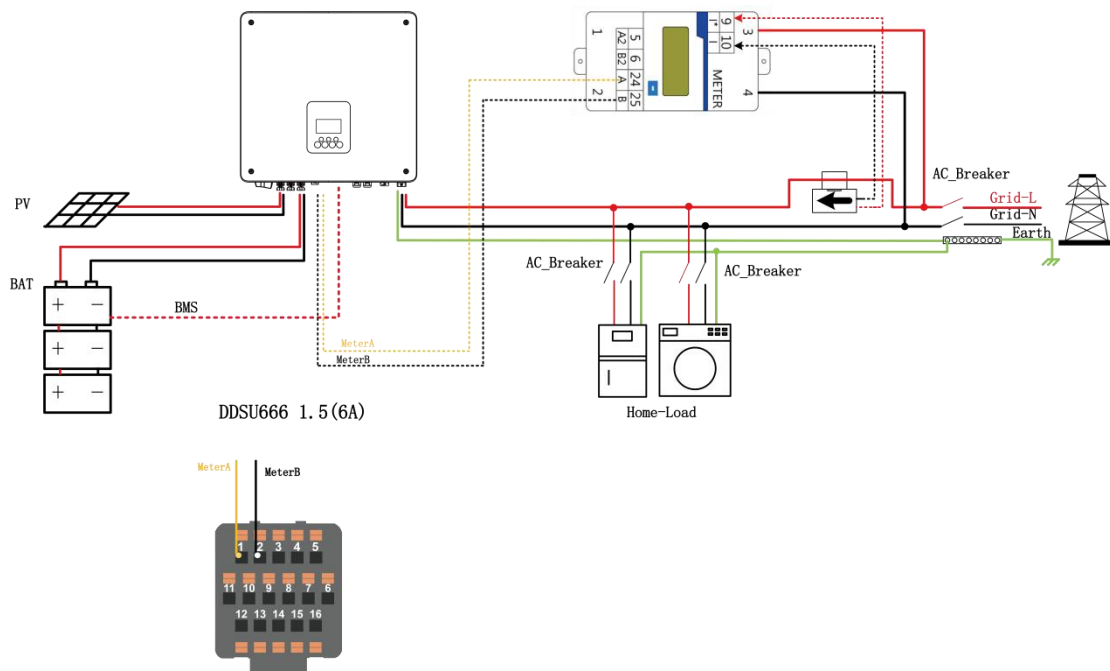
CT model	Factory	Ratio
CTSA016	YUANXING	100A/33.33mA
EICT-120K-T1000C	ELECMAT	120A/40mA

Export limitation setting:



The electricity meter is connected as follows:





Note:

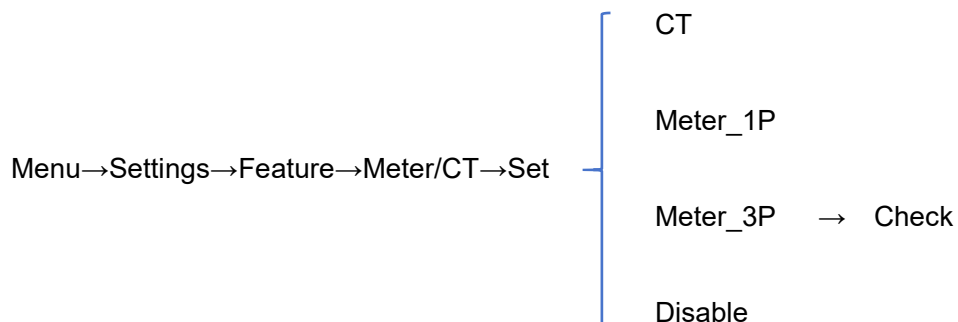
- H1-G2-WL standard with CT, you can refer to the CT wiring as shown in the figure wiring.
- Meter type: DDSU666 5(60A) / DDSU666 5(80A) (Optional)
- Meter is optional, respectively, DDSU666 5 (60A) and DDSU666 5 (80A), there are some differences between the two wiring, please refer to the wiring as shown in the diagram.
- **Detailed wiring for different conditions can be found in the user manual.**
- **CT and Meter only need to be connected to one when used.**
- Please be noted that the load/inverter connections and grid connections are illustrated in the figure below. Port 10 is specifically for neutral connection.
- This inverter has an integrated export management function. To enable this function, a power meter or CT must be installed. The CT should be clamped on the main live line of the grid side. The arrow on the CT should be pointing towards the grid. The red cable connects to CT1+, and the black cable connects to CT1-.
- For Meter installation, please install it on the grid side. The Meter cable connects to Meter485A/Meter485B.

Soft Limit:

After setting the Export Limit value, the inverter export power is limited to below the set value within 15s.

Hard Limit:

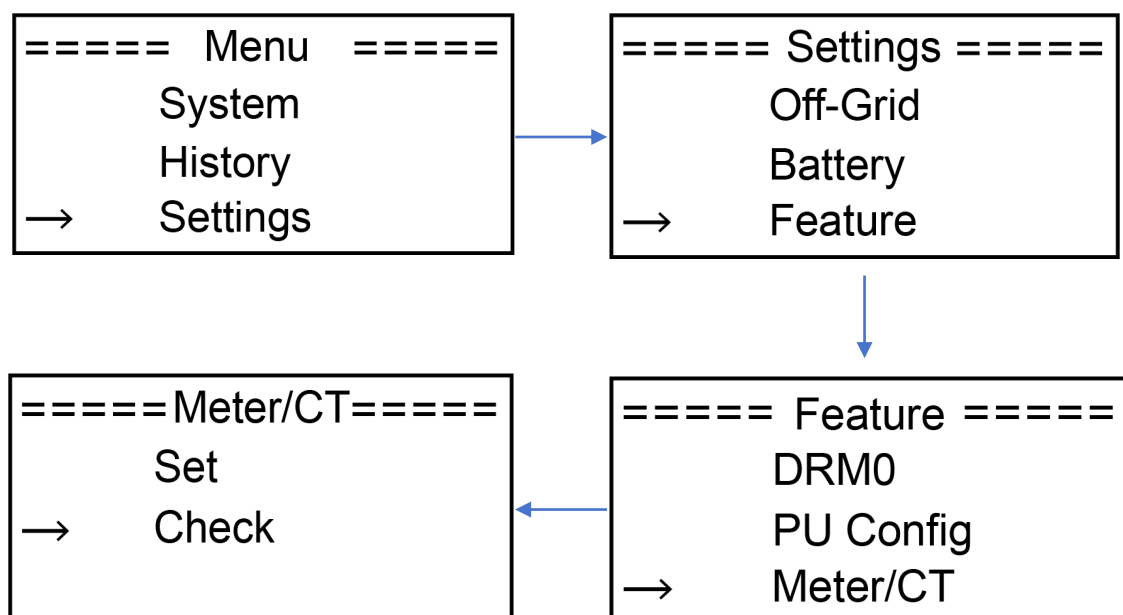
After setting the Export Limit value, the inverter will detect the export power in real time according to the CT or meter, and trigger the inverter to disconnect from the grid and shut down if the soft limit time requirement is not met; if the CT or meter communication is lost, the inverter will also trigger the disconnection and shut down.

6.6.6 CT/ Meter Self-Test Function Setting Instructions**1. Setting Guidelines**

Note: The self-test function for CT/electric meter can be set on the screen, and remote access has not yet been developed. The self-test function can only be applied when both the battery and the grid are connected, and the test will be conducted after grid connection.

2. Legend Explanation

First, select the corresponding CT or meter, and then follow the steps below to perform the self-test.



Result:

=====Meter/CT=====

Connect ok

Exit

=====Meter/CT=====

Unkonw State

Exit

3. 'Unknown state' explanation:

'Unknown State', this error will be reported in the following states:

- (a) The error occurs when the system is not connected to the battery, or if the connection is incorrect.
- (b) The error occurs when performing the self-test directly without selecting whether the connection is for the CT or the Meter.
- (c) The error occurs when the connection and selection do not match. (e.g., the system is connected to a CT, but the selected option is for an Meter)

Note: If the CT is connected in reverse, 'Connect Err' will be reported instead of 'Unknown State'.

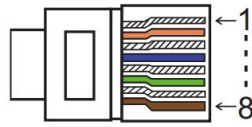
=====Meter/CT=====

Connect Err

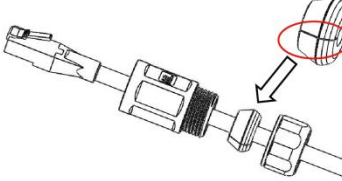
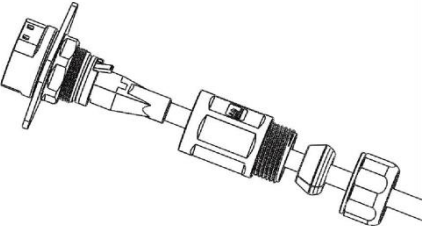
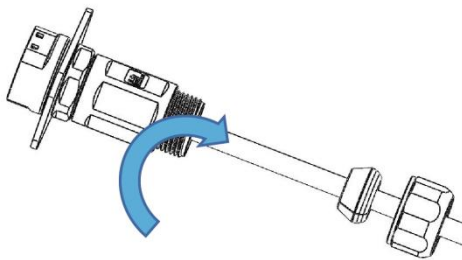
Exit

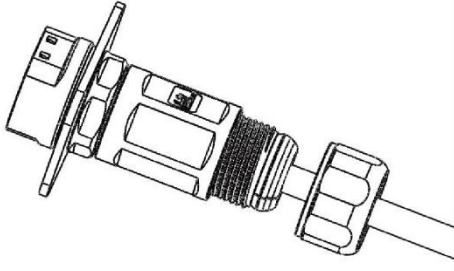
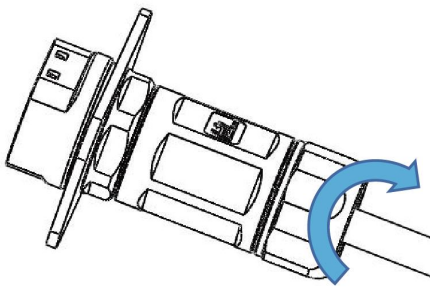
6.6.7 BMS

Communication interface between inverter and battery is RS485 or CAN with a Rj45 connector.

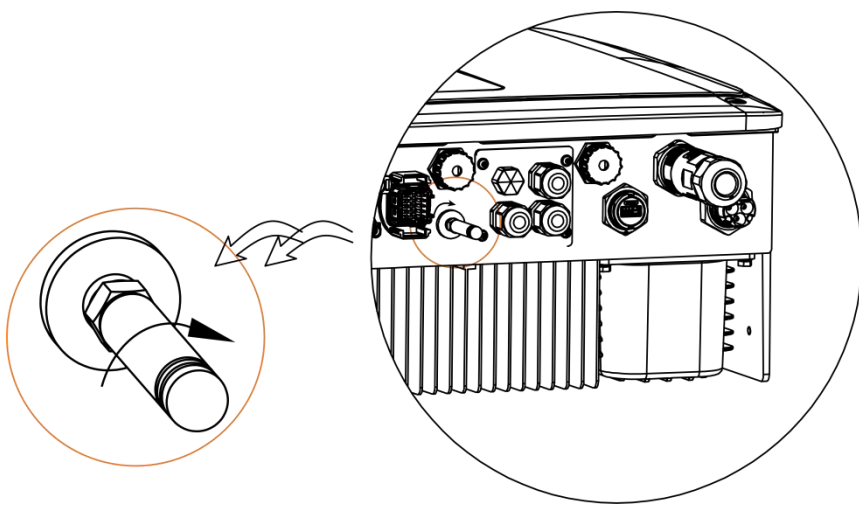


PIN	1	2	3	4	5	6	7	8
Definition	BAT AWAKEN	GND_COM	/	BMS_CANL	BMS_CANH	BMS_CANH	BMS_CANL	/

BMS and LAN Connection :	
Step 1	Insert the network cable into the wire-locking nut, sealing plug and main body in turn. The sealing plug is stuck into the network cable through the gap on the sealing side.
	 <p>Stuck into the network cable through the gap on the sealing side</p>
Step 2	Insert the network cable plug into the matched RJ45 panel mount connector.
	
Step 3	Tighten the connector mainbody by an open-ended wrench into the RJ45 panel mount connector with a torque 1.2 ± 0.2 N·m.
	

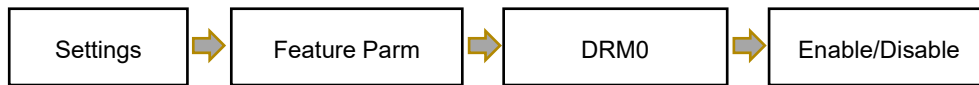
Step 4	Insert the sealing plug into the main body of RJ45 cable end connector.
	
Step 5	Tighten the connector's nut by an open-ended wrench with a torque 1.2 ± 0.2 N·m.
	

Antenna Installation

Step 1	Plug the antenna into the port at the bottom of inverter. Tighten the antenna clockwise.
	

6.6.8 DRM

DRM0 setting

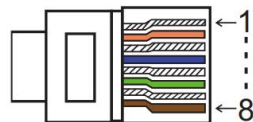


DRM is provided to support several demand response modes by emitting control signals as below.

Mode	Requirement
DRM0	Operate the disconnection device.
DRM1	Do not consume power.
DRM2	Do not consume at more than 50% of rated power.
DRM3	Do not consume at more than 75% of rated power and source reactive power if capable.
DRM4	Increase power consumption (subject to constraints from other active DRMs).
DRM5	Do not generate power.
DRM6	Do not generate at more than 50% of rated power.
DRM7	Do not generate at more than 75% of rated power and sink reactive power if capable.
DRM8	Increase power generation (subject to constraints from other active DRMs).

Note: Currently only supports DRM0 function, other functions are under development.

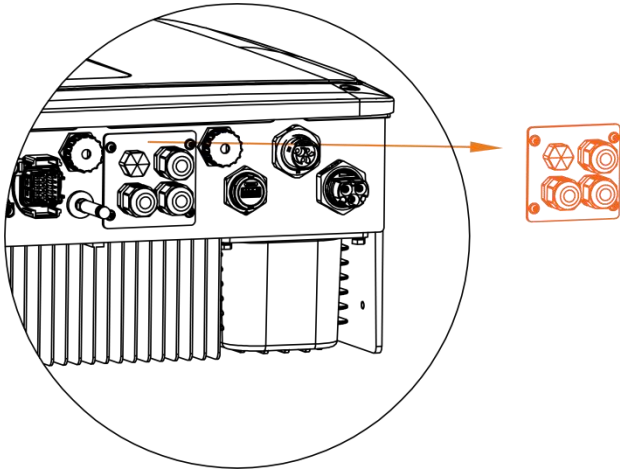
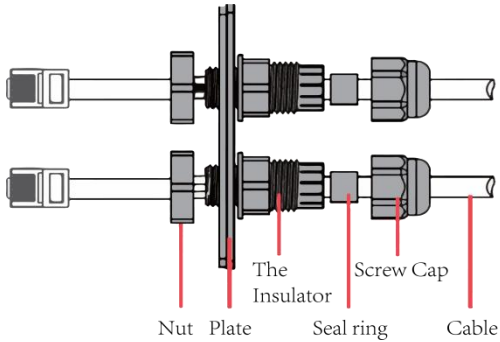
DRM PIN Definition



PIN	1	2	3	4	5	6	7	8
Definition	GND_COM	SHUTDOWN	OUT_DRM0	3.3V_COM	OUT_DRM4/8	OUT_DRM3/7	OUT_DRM2/6	OUT_DRM1/5

Model	Socket asserted by shorting pins		Function
ESTOP	1	2	Emergency stop the inverter.

Model	Socket asserted by shorting pins		Function
DRM0	3	4	Operate the disconnection device.

Procedures	
Step 1	Screw this plate off from inverter.
	
Step 2	Prepare a standard network cable and cable connector, then insert the network cable through the cable connector.
	
Step 3	Insert the cable connector into DRM/COM port at the bottom of inverter and screw it tightly. Then insert other side of the network cable into PC or other device.

Note!

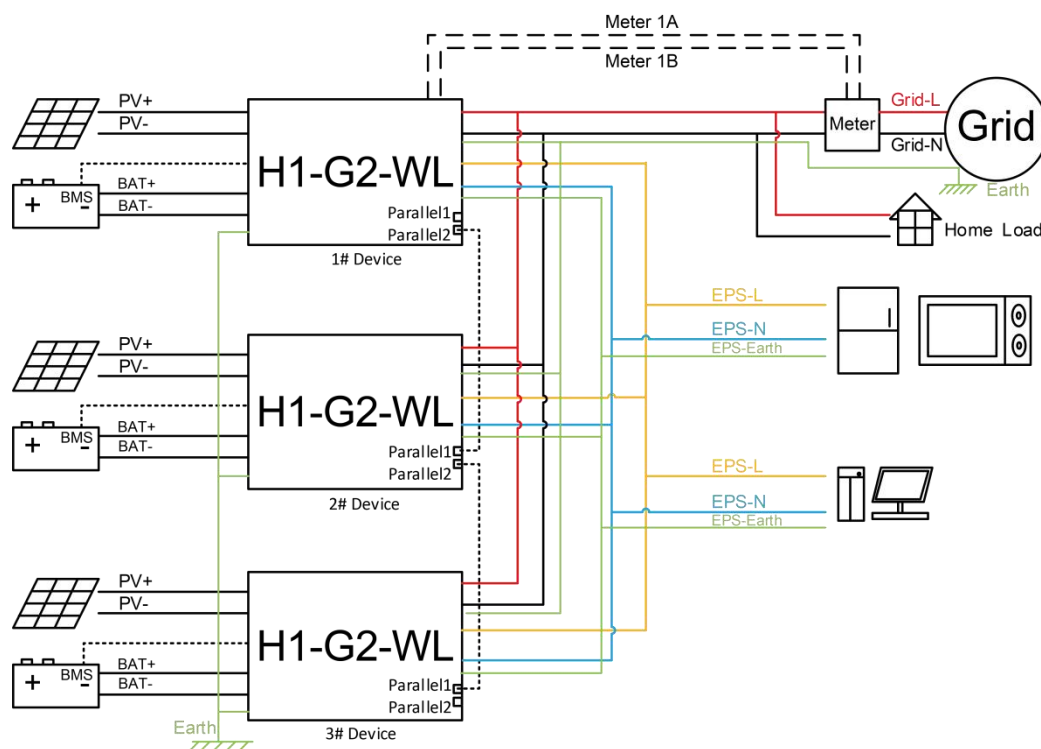
Isolated Fault: This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an Earth Fault Alarm occurs, the fault code Isolation fault will be displayed on the inverter screen and the RED LED indicator will light up.

6.6.9 On-Grid Parallel Connection/Off-Grid Parallel Connection

H1-G2-WL series Inverter provides the parallel connection function which should make five inverters maximumly connected in one system when the grid is on. In this system, H1-G2-WL series energy storage machines support the most parallel applications to achieve the purpose of capacity expansion. The following is an example of the wiring method of three parallel machines, using RJ45 network cable to connect the Parallel port of three machines hand in hand by setting the Parallel parameter. Number represents the number of parallel machines, for example, three machines in parallel can be written "3". Address represents the CAN address of each machine, any three non-repeating values between 1 and 249 can be set. When in the off-grid EPS state, there is no distinction between the main and slave inverters, it's all the main inverter sagging; when in the grid-connected state, it's the 'Master inverter' that's connected to the CT/Meter, and the others are the slave inverters.

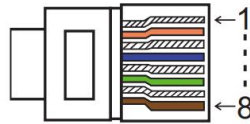
Note: If multiple parallel machines are far apart and the network cable between Parallel port is too long, you can put the terminal resistor in by dialing in the code and just set the first and last two devices to dial in.

Parallel 1/2 are the ports used in parallel. The system diagram is as follows:



Note!

When multiple inverters are used in parallel, it is recommended that the number of PV and battery configurations be as consistent as possible, and if there are differences, please ensure that each inverter has battery access as much as possible.



PIN	1	2	3	4	5	6	7	8
Parallel 1	GND_COM	Parallel_CANL	Parallel_CANH	CANL	CANH	+3.3V_COM	Parallel_485B	Parallel_485A
Parallel 2	GND_COM	Parallel_CANL	Parallel_CANH	CANL	CANH	+3.3V_COM	Parallel_485B	Parallel_485A

Please confirm the software version, some software does not support the parallel function, you can contact our service department.

Wiring Operation and LCD Setting

Note!

Please use the inverter that has the same firmware version for parallel connection to avoid compatible issue.

Step 1 Inverter Parallel Connection

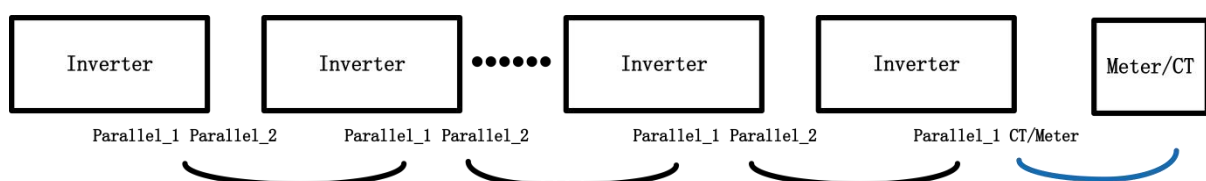
- Connect all inverters via their Parallel ports using standard CAT7 network cables.
- Plug one end of the CAT7 cable into the Parallel port of the first inverter.
- Connect the other end to the Parallel port of the next inverter.
- Repeat this process to link all inverters in sequence.

Step 2 Smart Meter Connection

- Use a CAT5 cable to connect the smart meter to the inverter system.
- Connect one end of the CAT5 cable to the smart meter/CT.
- Plug the other end into the "METER/CT" port of the inverter.

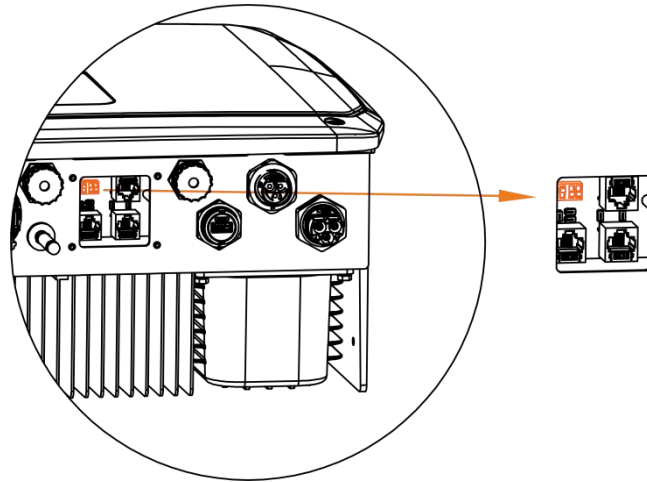
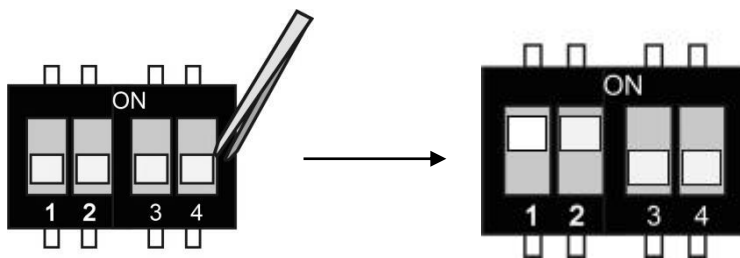
Note!

In on-grid systems, the smart meter must be connected to the master inverter. In this mode, either the first or the last inverter in the chain can be designated as the master inverter.

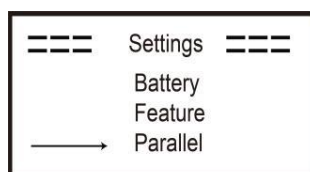
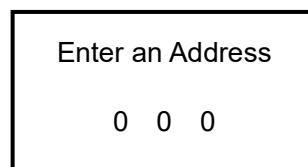
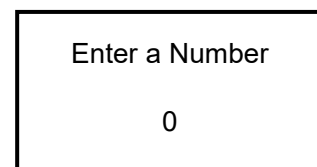


Step 3 Set the DIP switch (No need to set all inverter's DIP switch).

- Find the inverter with meter cable plugged.
- Push the white DIP switch to "ON" position (from down to up) by a suitable tweezers.
- Parallel machines at both ends of the head need to be dialed into the termination resistor.



Step 4 Find the inverter connected with the meter, then enter setting page of the inverter LCD display, then click parallel. Set Address first and then set Number. The range of Address is 1-249 and the range of Number is 2-8. address sets the id of the parallel machine, with a different value for each machine. Number sets the number of parallel machines, with the same value for each machine.

**How to exit from parallel system?**

If one inverter wants to exit from this parallel system, please follow the steps below:

if address is set to 250, the parallel mode is exited and the stand-alone mode is entered.

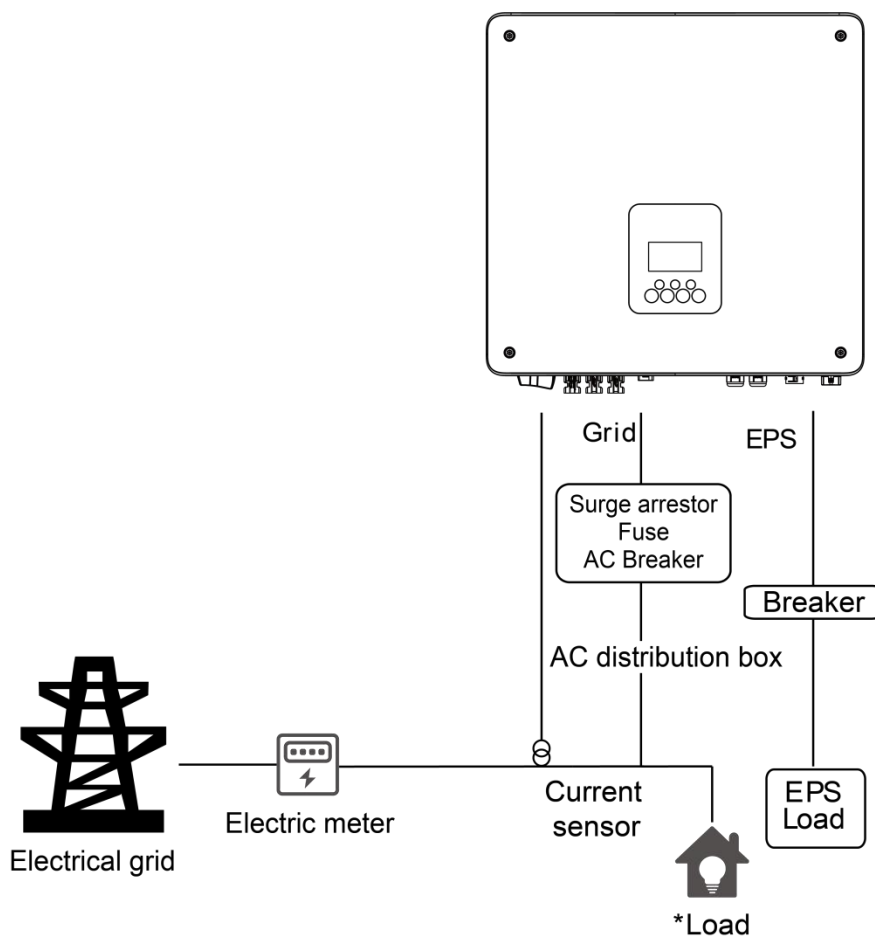
6.7 EPS Connection

6.7.1 EPS Wiring

EPS mode can be achieved by two different type of wiring methods. One is using the internal bypass to wire the house emergency loads on the EPS port from inverter. Another is using external contactor to wire the EPS loads on the contactor self (External contactor need to be purchased separately).

Note: the inverter default is set as “External” EPS wiring mode, it can be set to “Internal” via display setting “Menu – Setting – Feature – Bypass Relay”.

- **Use Internal EPS Wiring:**

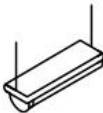
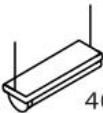


Note!

1. Under On-grid mode, please ensure that the EPS loads power is lower than the inverter's maximum Bypass power.
2. Under Off-grid mode, ensure that the EPS loads power is lower than the inverter's maximum EPS power.
3. We suggest not connect the inductive loads on EPS port.

6.7.2 Common Loads Description

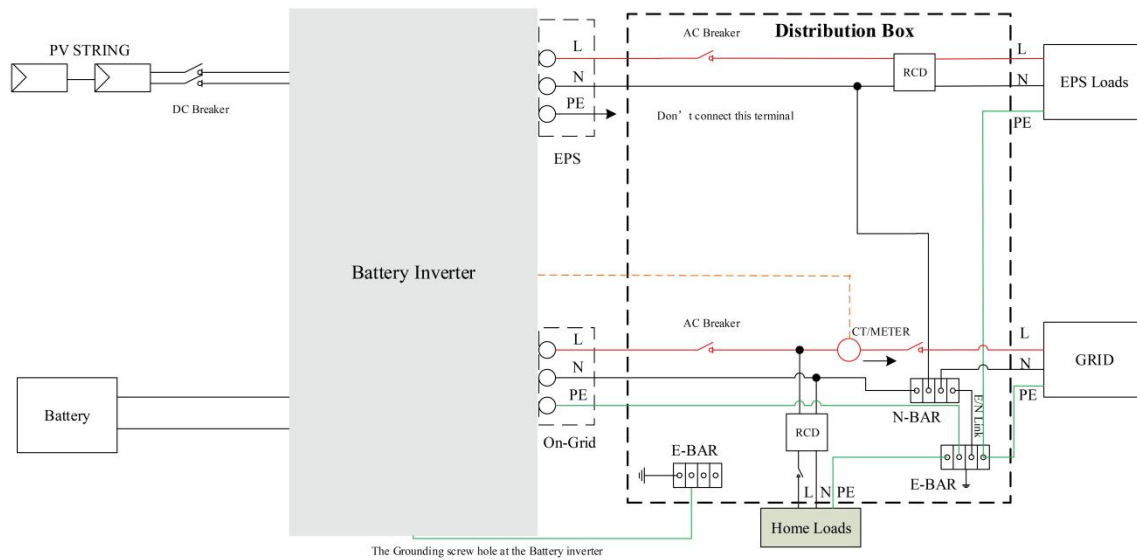
Under EPS mode, if need to connect the inductive load on EPS port, please ensure that the instantaneous power of the load at startup is lower than the maximum power of the EPS mode. Below table shows some conventional and reasonable loads for you reference. Please refer to your loads' manual for the actual specs.

Type	Power		Common equipment	Example		
	Start	Rated		Equipment	Start	Rated
Resistive load	X 1	X 1	  Incandescent lamp TV	 100W Incandescent lamp	100VA (W)	100VA (W)
Capacitive load	X 2	X 1.5	 Fluorescent lamp	 40W Fluorescent lamp	80VA (W)	60VA (W)
Inductive load	X 3~5	X 2	  Fan Fridge	 150W Fridge	450-750VA (W)	300VA (W)

6.8 System Connection Diagrams

Neutral line of alternative supply must not be isolated or switched.

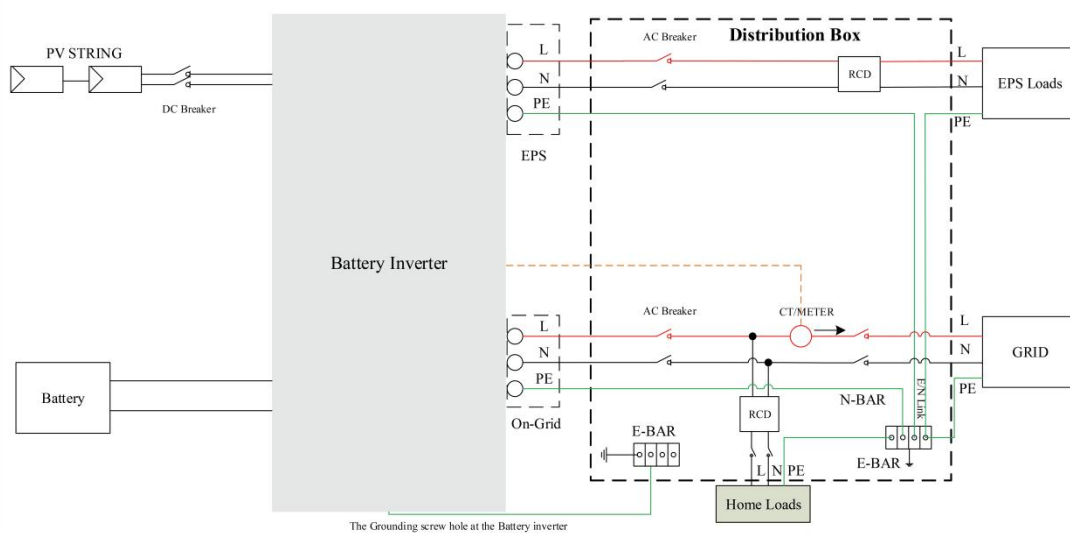
For countries such as Australia, New Zealand, South Africa, etc., please follow the local wiring regulation!



This is intellectual property of FOXESS CO., LTD

Neutral line of alternative supply must be disconnected after the grid is off.

For countries such as China, Germany, the Czech Republic, Italy, etc., please follow local wiring regulations!



This is intellectual property of FOXESS CO., LTD

6.9 Inverter Start-Up

Please refer to the following steps to start up the inverter.

1. Ensure the inverter fixed well on the wall.
2. Make sure all the DC wirings and AC wirings are completed.
3. Make sure the CT/meter is connected well.
4. Make sure the battery is connected well.
5. Make sure the external EPS contactor is connected well (if needed).
6. Turn on the PV/DC switch (for hybrid only), AC breaker, EPS breaker and battery breaker.
7. Enter the settings page, default password is '0000', select START / STOP and set it to start.

Note:

- When starting the inverter for the first time, the country code will be set by default to the local settings. Please check if the country code is correct.
- Set the time on the inverter using the button or by using the APP.
- The internal bypass relay is closed by default, if it needs to be opened, enter the setting page, select "Internal".
- EPS function is off by default, if it needs to be opened, enter the setting page, select EPS "ON/OFF", default eps voltage/frequency is 230V and 50Hz.

6.10 Inverter Switch Off

Please refer to the following steps to switch off the inverter.

1. Enter the settings page, select START / STOP and set it to stop.
2. Turn off the PV/DC switch (for hybrid only), AC breaker, EPS breaker and battery breaker.
3. Wait 5 min before you open the upper lid (if in need of repair).

7 Firmware Upgrading

7.1 Firmware Upgrading

User can upgrade inverter's firmware via a U-disk.

- **Preparation**

Please ensure the inverter is steadily powered on.

Inverter must keep the battery on through whole procedure of upgrading. Please prepare a PC and make sure the size of U-disk is under 32G, and the format is fat 16 or fat 32.

⚠ Warning!

Please DO NOT apply USB3.0 U-disk on inverter USB port, the inverter USB port only support for USB2.0 U-disk.

- **Upgrading steps:**

Step 1: Please contact our service support to get the update files, and extract it into your U-disk as follow:

update/master/ H1_master_vx.xx.bin

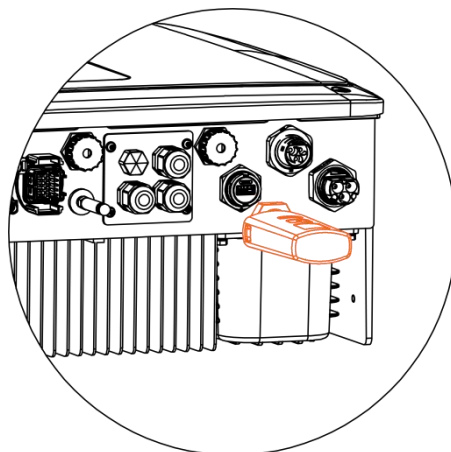
update/slave/ H1_slave_vx.xx.bin

update/manager/ H1_manager_vx.xx.bin

Note: vx.xx is version number.

Warning: Make sure the directory is in accordance with above form strictly! Do not modify the program file name, or it may cause the inverter not work anymore!

Step 2: Unscrew the waterproof lid and insert U-disk into the "USB" port at the bottom of the inverter.

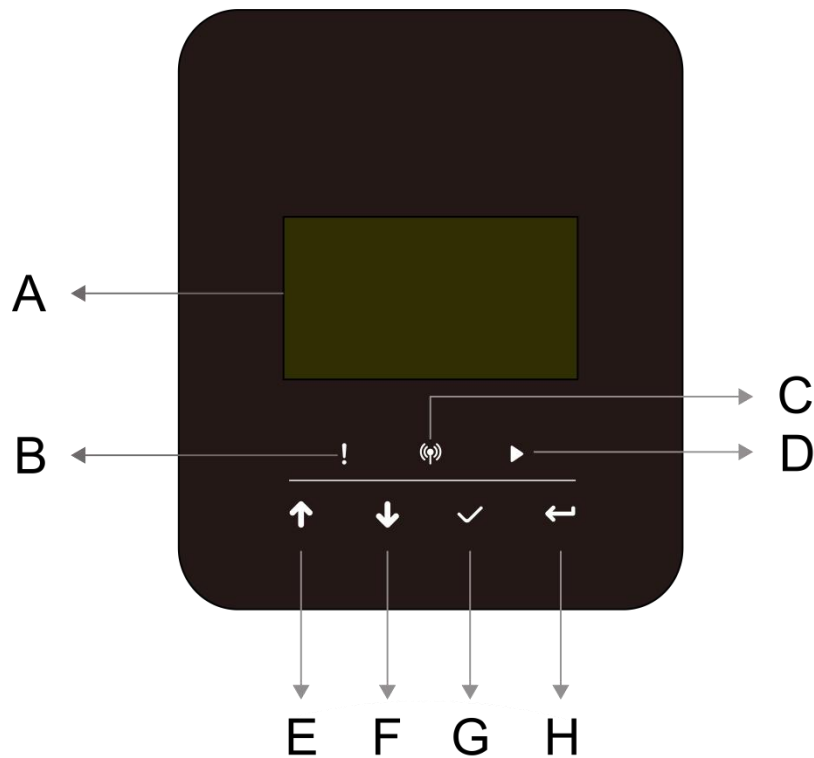


Step 3: The LCD will show the selection menu. Then press up and down to select the one that you want to upgrade and press "OK" to confirm to upgrade.

Step 4: After the upgrade is finished, pull out the U-disk. Screw the waterproof lid.

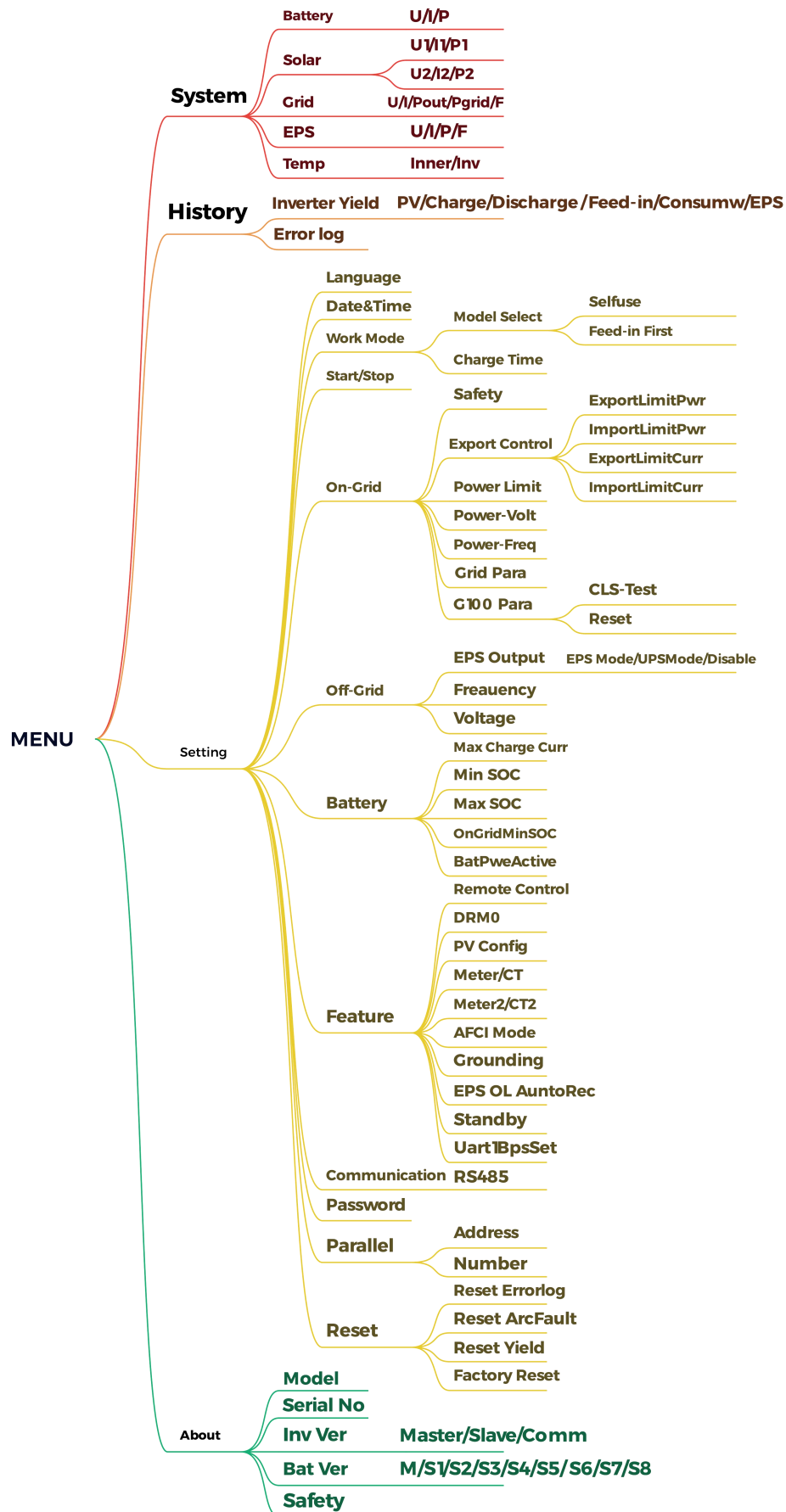
8Operation

8.1 Control Panel



Object	Name	Function
A	LCD screen	Display the information of the inverter.
B	Indicator LED	Red: The inverter is in fault mode.
C		Blue: Light off - no network connection Blink - connect to the internet Light on - connect successfully
D		Green: The inverter is in normal state.
E	Function button	Up button: Move cursor to upside or increase value.
F		Down button: Move cursor to downside or decrease value.
G		OK button: Confirm the selection.
H		Return button: Return the previous operation.

8.2 Function Tree



9 Maintenance

This section contains information and procedures for solving possible problems with the Fox ESS inverters and provides you with troubleshooting tips to identify and solve most problems that can occur.

9.1 Alarm List

Fault Code	Solution
Grid Lost Fault	Grid is lost. <ul style="list-style-type: none"> • System will reconnect if the utility is back to normal. • Or seek help from us, if not go back to normal state.
Grid Volt Fault	Grid voltage out of range. <ul style="list-style-type: none"> • System will reconnect if the utility is back to normal. • Or seek help from us, if not go back to normal state.
Grid Freq Fault	Grid frequency out of range. <ul style="list-style-type: none"> • System will reconnect if the utility is back to normal. • Or seek help from us, if not go back to normal state.
10min Volt Fault	The grid voltage is out of range for the last 10 Minutes. <ul style="list-style-type: none"> • System will reconnect if the utility is back to normal. • Or seek help from us, if not go back to normal state.
SW Inv Cur Fault	Output current high detected by software. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
DCI Fault	DC component is out of limit in output current. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
HW Inv Cur Fault	Output current high detected by hardware. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
SW Bus Vol Fault	Bus voltage out of range detected by software. <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.

Bat Volt Fault	<p>Battery voltage fault.</p> <ul style="list-style-type: none"> • Check if the battery input voltage is within the normal range. • Or seek help from us.
SW Bat Cur Fault	<p>Battery current high detected by software.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Iso Fault	<p>The isolation is failed.</p> <ul style="list-style-type: none"> • Please check if the insulation of electric wires is damaged. • Wait for a while to check if back to normal. • Or seek for help from us.
Res Cur Fault	<p>The residual current is high.</p> <ul style="list-style-type: none"> • Please check if the insulation of electric wires is damaged. • Wait for a while to check if back to normal. • Or seek for help from us.
Pv Volt Fault	<p>PV voltage out of range.</p> <ul style="list-style-type: none"> • Please check the output voltage of PV panels. • Or seek for help from us.
SW Pv Cur Fault	<p>PV input current high detected by software.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Temp Fault	<p>The inverter temperature is high.</p> <ul style="list-style-type: none"> • Please check if the environment temperature. • Wait for a while to check if back to normal. • Or seek for help from us.
Ground Fault	<p>The ground connection is failed.</p> <ul style="list-style-type: none"> • Check the voltage of neutral and PE. • Check AC wiring. • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Over Load Fault	<p>Over load in on grid mode.</p> <ul style="list-style-type: none"> • Please check if the load power exceeds the limit. • Or seek for help from us.
Eps Over Load	<p>Over load in off grid mode.</p> <ul style="list-style-type: none"> • Please check if the eps load power exceeds the limit. • Or seek for help from us.

Bat Power Low	<p>The battery power is low.</p> <ul style="list-style-type: none"> • Wait the battery to be recharged. • Or seek for help from us.
HW Bus Vol Fault	<p>Bus voltage out of range detected by hardware.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
HW Pv Cur Fault	<p>PV input current high detected by hardware.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
HW Bat Cur Fault	<p>Battery current high detected by hardware.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
SCI Fault	<p>The communication between master and manager is fail.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
MDSP SPI Fault	<p>The communication between master and slave is fail.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
MDSP Smpl Fault	<p>The master sample detection circuit is failed.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Res Cur HW Fault	<p>Residual current detection device is failed.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Inv EEPROM Fault	<p>The inverter eeprom is fault.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
PvCon Dir Fault	<p>The PV connection is reversed.</p> <ul style="list-style-type: none"> • Check if the positive pole and negative pole of PV are correctly connected. • Or seek help from us.
Bat Relay Open	<p>The battery relay keeps open.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Bat Relay Short Circuit	<p>The battery relay keeps close.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.

Bat Buck Fault	<p>The battery buck circuit mosfet is fail.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Bat Boost Fault	<p>The battery boost circuit mosfet is fail.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Eps Relay Fault	<p>The eps relay is failed.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
BatCon Dir Fault	<p>The battery connection is reversed.</p> <ul style="list-style-type: none"> • Check if the positive pole and negative pole of battery are correctly connected. • Or seek help from us.
Main Relay Open	<p>The grid relay keeps open.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
S1 Close Fault	<p>The grid relay S1 keep close.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
S2 Close Fault	<p>The grid relay S2 keep close.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
M1 Close Fault	<p>The grid relay M1 keep close.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
M2 Close Fault	<p>The grid relay M2 keep close.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
GridV Cons Fault	<p>The grid voltage sample value between master and slave is not consistent.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
GridF Cons Fault	<p>The grid frequency sample value between master and slave is not consistent.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Dci Cons Fault	<p>The dci sample value between master and slave is not consistent.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.

Rc Cons Fault	<p>The residual current sample value between master and slave is not consistent.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
RDSP SPI Fault	<p>The communication between master and slave is fail.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
RDSP Smpl Fault	<p>The slave sample detection circuit is failed.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
ARM EEPROM Fault	<p>The manager eeprom is fault.</p> <ul style="list-style-type: none"> • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Meter Lost Fault	<p>The communication between meter and Inverter is interrupted.</p> <ul style="list-style-type: none"> • Check if the communication cable between meter and Inverter is correctly and well connected.
BMS Lost	<p>The communication between BMS and Inverter is interrupted.</p> <ul style="list-style-type: none"> • Check if the communication cable between BMS and Inverter is correctly and well connected.
Bms Ext Fault	<p>The communication between BMS and Inverter is interrupted.</p> <ul style="list-style-type: none"> • Check if the communication cable between BMS and Inverter is correctly and well connected.
Bms Int Fault	<p>DIP switch at the wrong position; The communication between battery packs is interrupted.</p> <ul style="list-style-type: none"> • Move the DIP switch to the correct position; • Check if the communication cable between battery packs is correctly and well connected.
Bms Volt High	<p>Battery over voltage.</p> <ul style="list-style-type: none"> • Please contact battery supplier.
Bms Volt Low	<p>Battery under voltage.</p> <ul style="list-style-type: none"> • Please contact battery supplier.
Bms ChgCur High	<p>Battery charge over current.</p> <ul style="list-style-type: none"> • Please contact battery supplier.
Bms DchgCur High	<p>Battery discharge over current.</p> <ul style="list-style-type: none"> • Please contact battery supplier.
Bms Temp High	<p>Battery over temperature.</p> <ul style="list-style-type: none"> • Please contact battery supplier.

Bms Temp Low	Battery under temperature. • Please contact battery supplier.
BmsCellImbalance	The capacities of cells are different. • Please contact battery supplier.
Bms HW Protect	Battery hardware under protection. • Please contact battery supplier.
BmsCircuit Fault	Bms hardware circuit fault. • Please contact battery supplier.
Bms Insul Fault	Battery insulation fault. • Please contact battery supplier.
BmsVoltsSen Fault	Battery voltage sensor fault. • Please contact battery supplier.
BmsTempSen Fault	Battery temperature sensor fault. • Please contact battery supplier.
BmsCurSen Fault	Battery current sensor fault. • Please contact battery supplier.
Bms Relay Fault	Battery relay fault. • Please contact battery supplier.
Bms Type Unmatch	The capacity of battery packs is different. • Please contact battery supplier.
Bms Ver Unmatch	The software between slaves are different. • Please contact battery supplier.
Bms Mfg Unmatch	The cell manufacture is different. • Please contact battery supplier.
Bms SwHw Unmatch	The slave software and hardware are not match. • Please contact battery supplier.
Bms M&S Unmatch	The software between Master and Slave are not match. • Please contact battery supplier.
Bms ChgReq NoAck	No action for charging request. • Please contact battery supplier.

9.2 Troubleshooting

Step 1 Check the fault message on the system control panel or the fault code on the inverter information panel. If a message is displayed, record it before proceeding with further operations.

Step 2 Attempt the solutions shown in the table above.

Step 3 If your inverter information panel does not display a fault indicator, check the following items to ensure the current installation status permits normal operation of the unit:

- Is the inverter located in a clean, dry, and well-ventilated area?
- Is the DC input circuit breaker turned ON?
- Are the cables of appropriate size?
- Are the input and output connections and wiring in good condition?
- Are the configuration settings suitable for your specific installation?
- Are the display panel and communication cables correctly connected and undamaged?

Contact customer service for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit.

9.3 Routine Maintenance

Environmental factors such as temperature, humidity, dust, and vibration can lead to the aging of internal components, potentially causing latent failures or reducing the cabinet's service life. Therefore, it is necessary to perform both routine and periodic maintenance.

To avoid electric shock hazards before performing maintenance, inspection, or other operations:

- Disconnect all AC and DC side switches.
- Disconnect the front and rear circuit breaker switches of the integrated energy storage system.

Caution!

If only the AC and DC switches are turned off, the cable terminals inside the AC/DC cabinet of the energy storage system may still be live!

Do not open the doors of the equipment cabinets within the energy storage system during sandstorm seasons or when the ambient relative humidity exceeds 95%. Begin any maintenance work only in calm, clear, and dry conditions.

Note!

Ingress of sand/dust and moisture may damage the electrical equipment within the energy storage system or affect its operational performance!

- Only qualified and authorized personnel are permitted to perform maintenance operations on the energy storage system.
- After shutdown, wait at least 5 minutes before opening the cabinet doors. Before performing maintenance, ensure the internal components are completely de-energized.
- After power disconnection, hang warning signs at the disconnection points to prevent accidental re-energization during maintenance.
- To avoid accidental hazards, maintenance personnel should wear insulated protective gear during operations.
- During maintenance work, do not leave metal parts such as screws or washers inside the equipment, as this could damage the device!

Operating Environment Requirements

- Do not install the equipment in adverse environmental conditions: such as flammable, explosive gases or fumes, corrosive atmospheres, extreme high or low temperatures, or high humidity areas (Recommended ambient temperature: -25°C to +60°C).
- Keep away from open flames, flammable/explosive materials, and heating appliances to prevent equipment damage from heat or fire hazards.
- Adequate ventilation is crucial for heat dissipation. Do not block ventilation vents, heat dissipation systems, or cover the equipment with other items to prevent inverter malfunction or damage due to overheating.

Note!

The operating temperature range specified in the equipment technical specifications refers to the ambient temperature surrounding the equipment after installation, under which the equipment will operate effectively within the stipulated range.

Safety Inspection

A safety inspection must be performed by qualified technical personnel at least every 12 months. The inspection data should be recorded in the equipment log. If the equipment is not functioning correctly or fails any test, it must be repaired.

9.3.1 Maintenance Checklist

During inverter operation, responsible personnel should periodically inspect and maintain the unit. The required operations are as follows:

No.	Periodic Inspection Item	Inspection Frequency
1	Check if dust and dirt have accumulated on the heat sink at the rear of the inverter; clean the machine if necessary.	Perform Periodically
2	Check if the inverter's indicator lights are functioning normally.	Every 6 Months
3	Check input and output cables for damage or aging.	Every 6 Months
4	Clean the inverter panel and check its security at least every 6 months	Every 6 Months

Note: The above operations should only be performed by specialized personnel.

9.3.2 Fan Maintenance

The inverter's built-in fan provides cooling during operation. If the fan fails to operate correctly, the inverter cannot cool effectively, which may impact its efficiency or cause it to derate. Therefore, keep the fan clean and replace damaged fans promptly.

The procedure for cleaning or replacing the fan is as follows:

1. Before starting fan maintenance, always power down the inverter and disconnect all power inputs.
2. Wait 15 minutes after power down. Use testing equipment to verify the absence of voltage and current. Wear protective gear before operating or maintaining the inverter.
3. Shut down the inverter, turn the DC switch to "OFF" to ensure complete power-off, and wait at least 15 minutes.
4. Loosen the screws on the fan cover plate.
5. Loosen the fan bracket fixing screws, disconnect the cable connector, then remove the fan. Use a soft brush or vacuum cleaner to clean the fan or replace a damaged fan.

Note!

Fan maintenance must be performed by specialized personnel.

9.3.3 Touch-up Painting Guide

For surface dirt only:

- Clean using a cloth moistened with water or 97% alcohol.

For damaged topcoat:

- Smooth the damaged area surface using sandpaper.
- Clean the surface with 97% alcohol.
- After the surface dries, perform the touch-up painting operation on the damaged area, striving for an even and aesthetically pleasing application.

For paint damage exposing the substrate:

- Smooth the damaged area surface using sandpaper.
- Clean the surface with 97% alcohol.
- After the surface dries, apply a zinc-rich primer to the damaged area by spraying.
- After the primer dries, apply the topcoat, striving for an even and aesthetically pleasing application.

9.3.4 How vulnerabilities are disclosed

Vulnerability Report: Please upload a detailed description of the product vulnerability to security@fox-ess.com.

After receiving the vulnerability report, we will analyze it and reply within 7 working days. After confirming the vulnerability, we will provide the vulnerability repair plan within 30 working days. After confirming the solution, we will implement the repair and verification within 30 working days.

10 Inverter Storage and Disposal

10.1 Disassembling the Inverter

- Disconnect the inverter from the DC input and AC output. Wait for 5 minutes to ensure the inverter is completely powered down.
- Disconnect communication cables and any optional monitoring modules. Remove the inverter from the wall mounting bracket.

If possible, use the original packaging to repack the inverter. If the original packaging is unavailable, an equivalent box meeting the following requirements may be used:

- Capable of bearing a weight of 30 kg.
- Includes handles.
- Can be fully enclosed

10.2 Storing the Inverter

If the inverter is not put into operation immediately, it must be stored under specific environmental conditions.

- Regularly inspect the storage condition of the inverter. Check for moisture, mold, or signs of pest/rodent infestation. Replace packaging materials promptly if necessary.
- The equipment must be stored in a dry, well-ventilated area with a relatively stable temperature, consistently maintained between -30°C and 60°C, and a relative humidity range of 5% to 95%. Avoid direct sunlight and keep a distance of $\geq 2\text{m}$ from heat sources.
- Avoid locations subject to water splashing, rain, dampness, high temperatures, or outdoor exposure. If the floor is damp, place the packaging box on a shelf or elevated platform to avoid direct contact with the ground and minimize moisture risk.
- The storage area must be free of harmful gases, flammable, explosive materials, and corrosive chemicals.
- For long-term storage, the equipment must be covered or appropriate measures taken to protect it from contamination and environmental impact.
- Avoid mechanical shock, heavy pressure, strong electric fields, and strong magnetic fields.
- When stacking multiple inverters, do not exceed 4 cartons in height.
- Products stored under the above conditions for more than 12 months must undergo capacity verification tests and re-inspection before they can be used.

Note: Please adhere to the storage requirements. Product damage caused by failure to meet these conditions is not covered under warranty.

10.3 Transporting the Inverter

- Ensure the product is securely packaged before vehicle transport. Use enclosed containers for long-distance transportation.
- It is strictly prohibited to transport this product together with equipment or items that could potentially affect or damage it.

10.4 Decommissioning/Scrapping the Inverter

- Certain components of the inverter may cause environmental pollution. When disposing of the inverter or its related components, ensure compliance with local waste disposal regulations.

11 Appendix

11.1 Quality Guarantee

FOXESS CO., Ltd. (hereinafter referred to as "the Company") will, for products found to be faulty during the warranty period, repair the product free of charge or replace it with a new one.

Supporting Documentation Required

When requesting warranty service, the customer must present the original purchase invoice indicating the date of purchase. Furthermore, the product's trademark must be clearly visible. The Company reserves the right to decline warranty coverage if these conditions are not met.

Relevant Conditions

- Non-conforming products replaced under warranty shall be disposed of by the Company.
- The customer must allow the Company a reasonable period of time to complete repairs on faulty equipment.

Warranty Exclusions

The Company reserves the right to decline warranty coverage under the following circumstances:

- The entire machine or specific components have exceeded the free warranty period.
- Damage incurred during transportation.
- Faults resulting from incorrect installation, modification, or use.
- Operation in environments that exceed the limits specified as harsh in this manual.
- Malfunctions or damage caused by installation, repair, alteration, or disassembly performed by service organizations or personnel not authorized by the Company.
- Use or installation outside the scope defined in the relevant international standards.
- Damage caused by abnormal natural disasters.
- Damage resulting from storage conditions that do not meet the requirements stated in the product documentation.
- Any losses arising from failure to adhere to the safety precautions outlined in this manual.

If a product failure is caused by any of the above circumstances and the customer still requests repair services, the Company's authorized service organization may, upon assessment, provide repair services subject to a charge.

Other Provisions

The Company reserves the right to change product dimensions and parameters based on its latest documentation without prior notice.

11.2 Contact Us

If you have any questions about the product, please contact us:

- Fox ESS Headquarters: No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China.
- Wuxi R&D Center: No. 37 Huaqing Avenue, Wuxi Economic Development Zone (Intersection of Huaqing Avenue and Huayun Road)
- Wuhan R&D Center: 6th Floor, Block A, Tower T4, CHINA PROCUREMENT CENTER, No.789 Gaoxin Avenue, East Lake New Technology Development Zone, Wuhan City, Hubei Province, P.R. China
- Shanghai R&D Center: No.1255, Jinhai Road, Pudong New Area, Shanghai, China
- After-Sales Service Hotline: 400 1888 900
- Contact Telephone (Wenzhou): 0577-88159999
- Contact Telephone (Wuxi): 0510-68092998
- Contact Us: info@fox-ess.com
- Contact Us (EV Charger): ev@fox-ess.com
- After-Sales Service: service@fox-ess.com