

INTEG **M** HYBRID INVERTER

M2HT-9.9/10/14.9/15/19.9/20/24.9/25/29.9/30K-80



User Manual

M2HT-30K-80-UMEN-T1

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1. About This Manual

1.1. Purpose

This manual is an integral part of Solinteg M2HT-10~30K-80 series three-phase high-voltage hybrid inverters (hereinafter referred to as the inverter). It mainly introduces the assembly, installation, electrical connection, debugging, maintenance and troubleshooting of the products. Please read this instruction carefully before installation.

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1.2. How to Use This Manual

Before installing and using inverters, please read this manual carefully, understand the safety information and be familiar with the functions and characteristics of inverters. The manual content of subsequent versions of the inverter may be subject to change. The latest manual can be found at www.solinteg.com.

1.3. Target Groups

This manual is applicable to electrical installers with professional qualifications and endusers, who should have the following skills:

- ✧ Training for installation and commissioning of the electrical system, as well as dealing with hazards.
- ✧ Knowledge of the manual and other related documents.
- ✧ Knowledge of the local regulations and directives.
- ✧ Knowledge of the contents of this manual.

Only personnel who meet the above requirements are authorized to perform installation, maintenance and troubleshooting. Unauthorized personnel do not operate the equipment.

1.4. Symbols

This manual contains important safety and operation instructions that must be accurately understood and followed during the installation and maintenance of the equipment. To ensure accurate use of this manual, please note the following symbol explanations.



DANGER

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



WARNING

Indicates a hazard with a medium level of risk that, if not avoided, could result moderate injury or property damage.

**CAUTION**

Indicates a hazard with a low level of risk that, if not avoided, could result in minor injury or property damage.

**NOTE**

Provides extra info to help users use the equipment better. "NOTE" is not a safety warning and does not involve personal, equipment, or environmental hazard information.

2. Safety Instructions

2.1. Statement

Please read this manual carefully before transporting, storing, installing, operating, using and maintaining the equipment, adhere to safety cautions in this manual and equipment.

Solinteg has the right not to undertake quality assurance in any of the following circumstances:

- ✧ Damages caused by improper transportation.
- ✧ Damages caused by incorrect storage, installation or use.
- ✧ Damages caused by installation and use of equipment by non-professionals or untrained personnel.
- ✧ Damages caused by failure to comply with the instructions and safety warnings in this document.
- ✧ Damages of running in an environment that does not meet the requirements stated in this document.
- ✧ Damages caused by operation beyond the parameters specified in applicable technical specifications.
- ✧ Damages caused by unauthorized disassembly, alteration of products or modification of software codes.
- ✧ Damages caused by unauthorized opening of the equipment's cover and disassembling or replacing internal components.
- ✧ Damages caused by abnormal natural environment (force majeure, such as lightning, earthquake, fire, storm, etc.).
- ✧ Any damages caused by the process of installation and operation which don't follow the local standards and regulations.
- ✧ Products beyond the warranty period.

2.2. Personnel Safety

- ✧ Installers must undergo professional training or obtain electrical-related professional qualification certificates.
- ✧ Do not wear watches, bracelets, rings, necklaces, and other conductive objects during installation and operation, to avoid electric shock and burns.
- ✧ Do not operate with electricity during the installation. When removing or installing cables, sparks and arcs generated by live-line operation can cause fire or personal injury.

- ✧ Installers must wear professional protective devices during installation and operation of the equipment.
- ✧ Do not touch the equipment during the operation since the temperature of some parts of the equipment may exceed 60°C. Touch after the equipment cooling down.
- ✧ Install the equipment out of reach of children and small animals.

2.3. General Safety Statements

- ✧ Please strictly follow the content of the manual for proper operation.
- ✧ Please strictly comply with local regulations for electrical connections.
- ✧ Please disconnect the electricity while installing the equipment. Live-line operation is prohibited.
- ✧ Please ground the equipment prior to installation. When removing the equipment, detach the grounding protective wire as the final step.
- ✧ Please select proper cable size according to the local regulation and requirements from this manual.
- ✧ During the installation of the device, ensure that the cables are firmly connected and the screws are tightened properly.
- ✧ Any cable damages must be replaced by a professional to avoid risks.
- ✧ Please disconnect the power source before connection of power or communication cables. Live-line operation is strictly prohibited.
- ✧ Do not open the front cover of the equipment during installation. Unauthorized opening of the cover and replacement of internal components may result in personal injury, damage to the inverter, and voiding of the warranty.
- ✧ Do not connect lithium battery terminals without advance turning off the circuit breaker or main power switch to avoid personal injury due to high voltage.

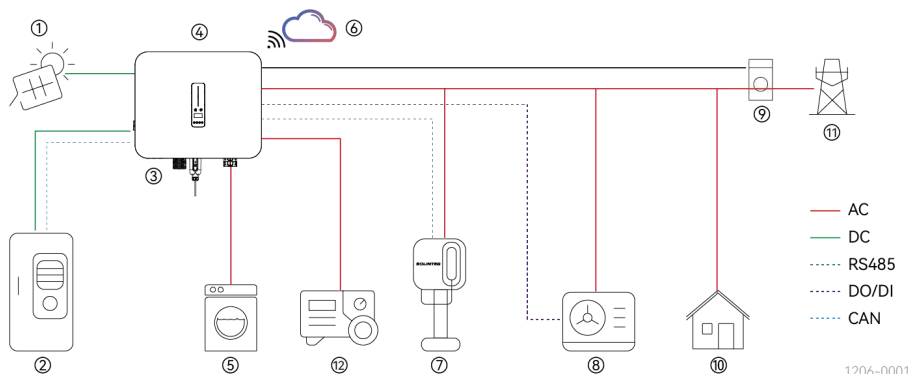
3. Product Description

The Solinteg M2HT-10~30K series inverter is also known as three-phase hybrid inverter or three-phase storage inverter, which is mainly used to combine the PV array, lithium battery, loads and power grid to realize intelligent power management and dispatching.

The M2HT-10~30K-80 series hybrid inverter includes 10 models which are listed below:

M2HT-9.9K-80, M2HT-10K-80, M2HT-14.9K-80, M2HT-15K-80, M2HT-19.9K-80, M2HT-20K-80, M2HT-24.9K-80, M2HT-25K-80, M2HT-29.9K-80, M2HT-30K-80.

3.1. System Overview

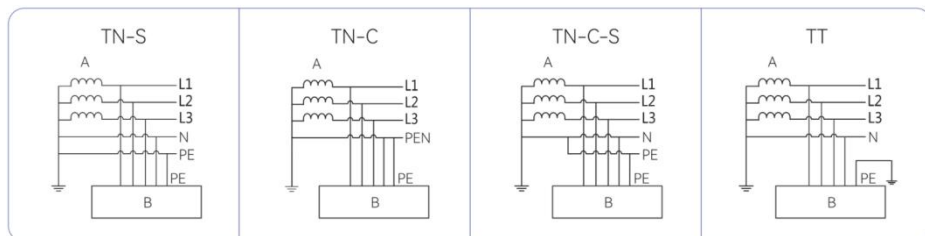


Item	Name	Description
1	PV Strings	
2	Battery	Ensure use of high-voltage Lithium-ion batteries that have been per-matched. For details on the compatibility list, please contact Solinteg service team.
3	Communication module	The communication module is shipped with the device.
4	Inverter	M2HT-10~30K-80 series inverter.
5	Back-up Loads	Loads required to operate under off-grid conditions.
6	Solinteg Cloud	Solinteg monitoring platform (www.solinteg-cloud.com)
7	EV Charger	The EV charger should be the Solinteg ECA series if control is required. For details on specific models, please contact Solinteg service team.
8	Smart Load	Smart loads (e.g., heat pumps compliant with the SG READY function), refer to Section 7.6 Smart Load .
9	Current Transformer (CT)	The CTs is shipped with the inverter. If the CTs do not meet site requirements, order the larger-specification CTs or the RMM meter from Solinteg.

Item	Name	Description
10	On-grid Loads	On-grid general load.
11	Utility Grid	
12	Diesel generator	

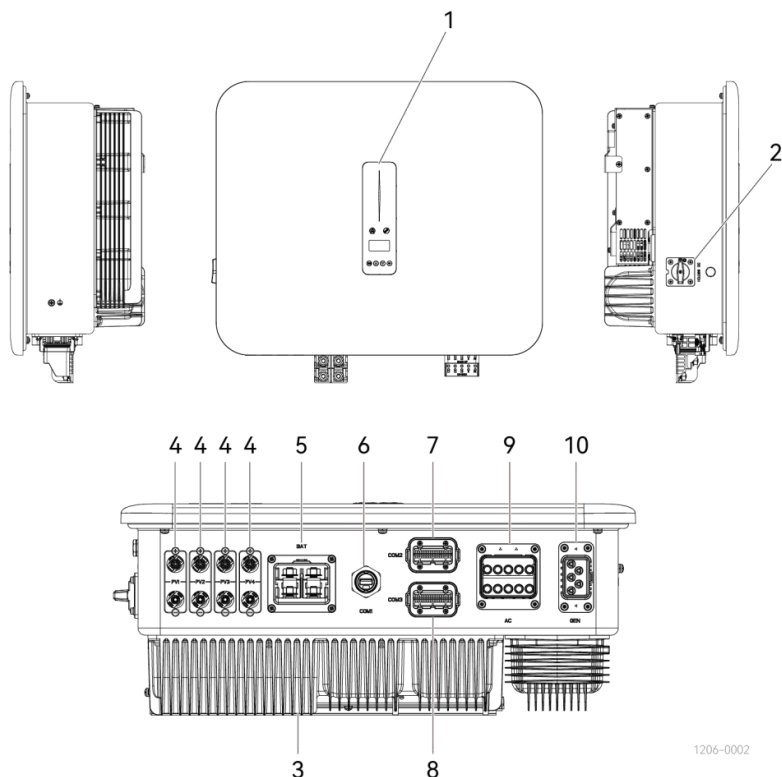
3.2. Applicable Grid Types

The applicable grid types for the inverter are TN-S, TN-C, TN-C-S and TT. When applied to the TT grid, the voltage of N to PE suggests less than 30V.



(A) Transformer (B) Inverter

3.3. Appearance



1206-0002

Item	Name	Description
1	Indicator, display and button	Display the operation information and working status of the inverter.
2	DC SWITCH	Used to disconnect/connect PV input.
3	Hanger	Used to hang the inverter on the wall-mounting bracket.
4	PV1/PV2/PV3/PV4	PV string input.
5	BAT	Battery connection.
6	COM1	Communication module connection port.
7	COM2	For connecting the multifunctional connector, refer to section 7.2 Multifunction Port for port definitions.
8	COM3	
9	AC	Used for grid and load cable connection.
10	GEN	Used for generator or smart load cable connection.

3.4. Symbols on the Inverter

Symbols	Description
	TÜV mark of conformity.
	CE mark, the inverter complies with the requirements of the applicable CE guide lines.
	RCM mark, the inverter complies with Australian RCM requirements.
	To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, endusers of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.
	Please read the instructions carefully before installation.
	Danger!
	The surface is hot during operation and do not touch.
	Do not touch any internal parts of the inverter within 10 minutes of disconnecting the power, battery and PV input.
	Risk of electric shock!
	Grounding mark.

3.5. Operation Modes

Users can set the inverter's operating modes through the monitoring web portal, mobile app, or display screen. Below are descriptions of the primary operating modes and functions. For further details, please contact the Solinteg service team.

General Mode:

In this operation mode, when the PV power is sufficient, it will be dispatched in the following sequence: loads first, the battery second, and the grid last (You can set the export power to the grid to 0W when the local grid doesn't allow inverter power to feed to the grid).

When the PV power is insufficient, the battery will discharge to supply loads, and the grid will join in if the battery is not enough to supply loads (or the battery reaches the End SOC).

Feed-in Mode:

When the PV power is sufficient, it will be dispatched in the following sequence: loads first, the grid second and the battery last.

When the PV power is insufficient, the PV and the battery will supply loads together. When the battery power is insufficient (or the battery reaches the End SOC), the grid will join together to supply loads.

Backup Mode:

The inverter will use power from the PV and the grid to charge the battery until it is fully charged, and any excess power will supply the loads. The battery will not discharge as long as the grid is available.

When the grid fails, power from PV and battery will supply loads connected on the back-up side (PV Priority).

ToU Mode:

Users can set different operation modes within a time group.

The modes available for setting within a Time of Use (ToU) time group include General Mode, Battery Charge, PV Charging, Peak Shifting, Feed-in Mode and Battery Discharge.

The logic for General Mode, Feed-in Mode and Peak Shifting remains unchanged.

Battery Charge: This mode allows both the PV and the grid to charge the battery, with the option to set a charging power limit and the end charging SOC.

PV Charging: This mode only allows the PV to charge the battery, with the option to set a charging power limit and the end charging SOC.

Battery Discharge: This mode allows to set a discharging power limit and the end discharging SOC.

Off-grid Mode:

This mode is typically only activated in off-grid scenarios.

In the off-grid mode, when the PV power is sufficient, it will supply the back-up loads first and then charge the battery if there's surplus power.

When the power from PV is insufficient, the battery will discharge to supply back-up loads together with PV.

In other modes, the inverter will automatically switch to off-grid status (provided the On-Off Grid switch is activated) to supply power to the Back-up side loads during grid outages. Upon grid recovery, the inverter resumes the original operational mode.

Peak Shifting:

If the load power < set point, after meeting the load demand, PV and grid power will charge the battery.

If the load power > set point, the energy from PV and the battery will compensate for the portion of load power exceeding the set point.



CAUTION

- ✧ In Peak Shifting mode, the portion of load power exceeding set point must be less than or equal to the inverter's maximum grid-connected output power (Pacmax); otherwise, the inverter will only output Pacmax.
- ✧ Due to delays in the inverter's data acquisition and power response, compensation exhibits a lag effect. Therefore, sudden power surges from the load cannot meet the grid's requirement that the lower set power limit must not be exceeded at any time.

Export limit:

After activation, the inverter will limit the power exported to the grid based on the set point.



CAUTION

- ✧ The Export limit function requires support from a CT or meter (with CT). If a CT or meter is not installed, the inverter will shut down in HARD mode, and in SOFT mode, the inverter's maximum output power is limited to the set value.
- ✧ Due to the delay between data acquisition and power response, the limitation inherently introduces a lag effect. Therefore, during instantaneous high-power fluctuations in loads and photovoltaic generation, the requirement that "power limits must not be exceeded at any moment" cannot be fulfilled.

3.6. Off-grid Statement



DANGER

This product is strictly prohibited from being used to power life-directly-related and life-sustaining medical equipment, as a power interruption would directly endanger life safety.



WARNING

- ✧ The product is not applicable to equipment or precision instruments that may be subject to failure or damage due to power outages or voltage fluctuations.
- ✧ Please disconnect breakers on the Back-up and On-grid sides when performing the Back-up inspection and maintenance, to completely isolate the loads and the inverter.
- ✧ The Back-up side cannot be directly connected to the grid.



CAUTION

- ✧ This product is prohibited from being used as a traditional UPS.
- ✧ When the inverter operates in off-grid mode and there is no available energy from PV or battery, the power supply on the AC output side will automatically terminate. Solinteg disclaims any legal liability for consequences arising from failure to comply with this instruction.

Generally, the M2HT-10~30K-80 series inverter's On-grid and Off-grid switching time is within 10ms. However, some external factors may cause the inverter to fail in switching to Off-grid operation. Therefore, please check the following precautions for using the Back-up function.

- ✧ Do not connect critical loads requiring uninterrupted stable power supply.
- ✧ Battery discharge current may be limited by battery status factors including temperature (ambient and internal) and state of charge (SOC).
- ✧ For standalone operation, do not exceed the Backup function's maximum output capacity. In parallel off-grid configurations, total load must remain below 2/3 of the combined rated power of all paralleled inverters. Account for inrush current during load startup.
- ✧ During mode switching and off-grid operation, load peak current and duration must not exceed inverter off-grid capability. System stability is affected by both continuous power and inrush current demands. Avoid simultaneous startup of high-inrush equipment.

Typical Load Categories	Load Characteristics
Motor Loads (e.g., electric saws, water pumps)	High Inrush Current at Startup: The startup current may exceed the inverter's maximum output current. Even if the load power is within the inverter's off-grid operating range, the load may fail to start.
Dynamic Power Loads (e.g., washing machines, soy milk makers, rice cookers, ovens, welding machines)	Power Fluctuations During Operation: The load power repeatedly fluctuates during normal operation.
High Harmonic Current Loads (e.g., induction cookers, hair dryers, hot air guns, impact drills, welding machines)	Non-sinusoidal Current: The current waveform is non-sinusoidal, potentially causing voltage distortion.



NOTE

Inverter Off-grid peak output capability details are provided in the Appendix specifications.

3.7. Power Derating Statement

Power derating is the inverter's core protection mechanism, proactively reducing output power to mitigate overload risks, or responding to grid dispatch requirements.

The scenarios that require inverter power derating include, but are not limited to, the following:

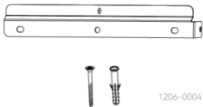
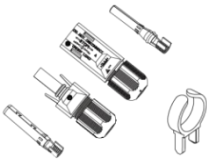
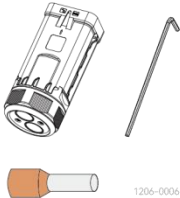
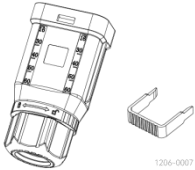
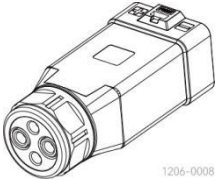
- ✧ Temperature Protection: Ambient temperature > 45 °C or overheating of critical internal components.
- ✧ Export limit: When PV power exceeds the sum of load consumption and battery charging power, and export limit is enabled.
- ✧ Grid Dispatch Response: Compliance with RCR/DRED grid dispatch commands.
- ✧ Grid Safety Compliance: Derating according to selected safety standards and configuration parameters when grid voltage and/or frequency exceeds thresholds.
- ✧ EMS Dispatch Response: Execution of dispatch commands from the Energy Management System (EMS).

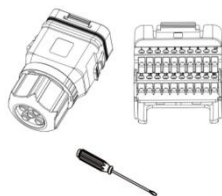
4. Unpacking and Storage

4.1. Packing List

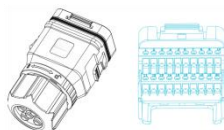
The device is thoroughly tested and strictly inspected before delivery. Nonetheless, damage may still occur during shipping. For this reason, please conduct a thorough inspection after receiving the device. Please contact Solinteg or the transport company in case of any damage or incompleteness, and provide photos to facilitate services. The package of the inverter includes the following accessories.

Please check whether the accessories in the packing box are complete when receiving the goods.

 1206-0003 1 Inverter (1pcs)	 1206-0004 2 Inverter bracket (1pcs) Expansion plug set (3pcs)	 1206-0005 3 PV connector (4 pairs) Unlocking Tool (1pcs)
 1206-0006 4 AC connector (1pcs) Cold-pressed terminal (10pcs)	 1206-0007 5 Generator Connector (1pcs) Disengagement Tool (1pcs)	 1206-0008 6 Battery connector (1pcs)



7 COM2 multi-function connector (1pcs)
Screwdriver (1pcs)



8 COM3 multi-function connector (1pcs)



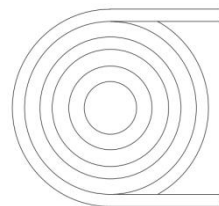
9 Communication module (1pcs)



10 120A CT (3pcs)



11 M5 bracket fixed bolt (1pcs)
Grounding OT terminal (1pcs)



12 3m battery communication cable (1pcs)

Quick
Installation
Guide

13 Quick Installation Guide (1pcs)



NOTE

- ✧ Handle with care when removing packaging to prevent scratching the equipment. Ensure the device remains stable during packaging removal.
- ✧ Do not allow the inverter's bottom ports and terminals to bear weight. Avoid direct contact between ports, terminals, and the ground or any supporting structures.
- ✧ When placing the inverter on the ground, use foam or cardboard padding underneath to prevent casing damage.

4.2. Storage Considerations

- ✧ Please store the inverter in the original packages.
- ✧ Inverters must be stored in a clean and dry location and protected against dust and moisture ingress.
- ✧ Do not put heavy objects on the inverter.
- ✧ When inverters are stored in stacks, the number of stacked layers must not exceed the "maximum stacking layers" indicated on the outer packaging.
- ✧ Storage temperature: $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$.

4.3. Safe Transport Instruction

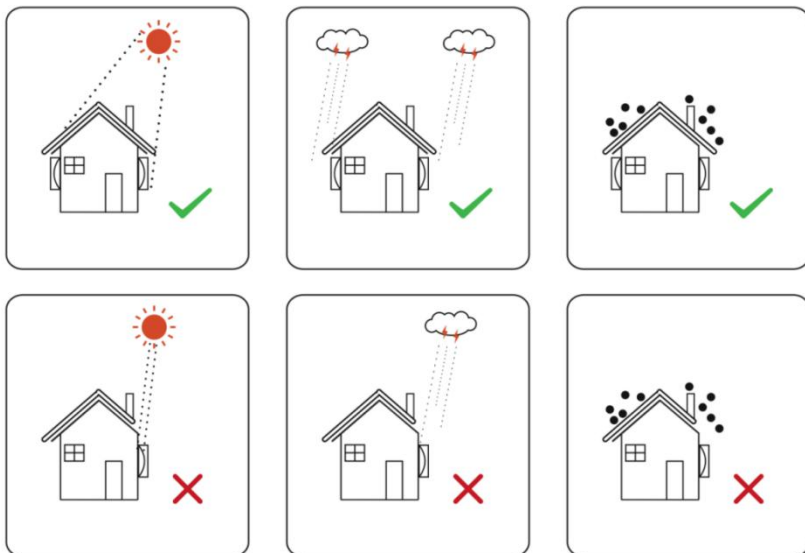
- ✧ Observe the caution signs on the inverter's packaging before transportation.
- ✧ Pay attention to the weight of the inverter. Be cautious to avoid injury when carrying it. Transport according to the personnel quantity required by local regulations.
- ✧ Use the inverter's original packaging during transportation.

5. Installation

5.1. Location

The inverter is designed with IP66 protection enclosure for indoor and outdoor installations.

- ✧ The inverter must be installed on a solid wall or mounting bracket capable of supporting its weight.
- ✧ Please do not install the inverter on drywall or any other wall with poor sound insulation.
- ✧ Install the inverter at eye level for easy inspection of screen data and further maintenance.
- ✧ Position the inverter in locations accessible for wiring and maintenance activities.
- ✧ The inverter must be installed out of reaching for children.
- ✧ Install the inverter in a well-ventilated, open area to ensure proper heat dissipation. If the inverter needs to be installed in a closed or semi-closed environment, please install additional heat dissipation or ventilation devices. Furthermore, while the inverter is operating, ensure the indoor ambient temperature does not exceed the outdoor ambient temperature. A semi-closed environment refers to a special space where natural ventilation is limited and gas or heat may easily accumulate, although it is not fully enclosed on all six sides.
- ✧ Environmental parameters (temperature, humidity, altitude) must comply with technical specification requirements.
- ✧ Do not expose the inverter to direct sunlight, nor to rain or snow.
- ✧ The inverter is not suitable for use in dusty environments.



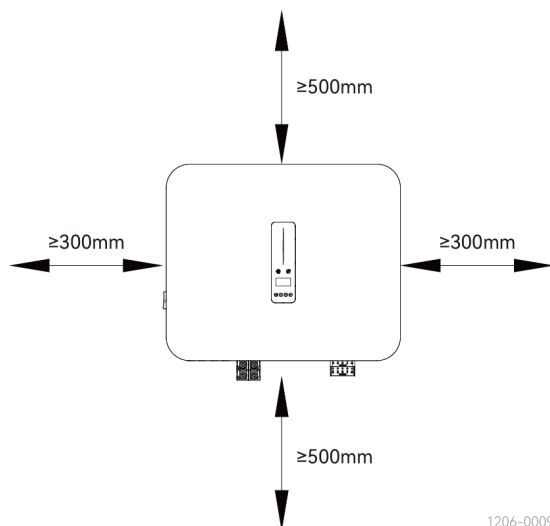
WARNING

Do not put flammable and explosive articles around the inverter.

5.1.1. Installation Spacing

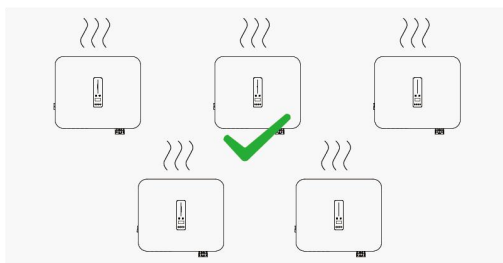
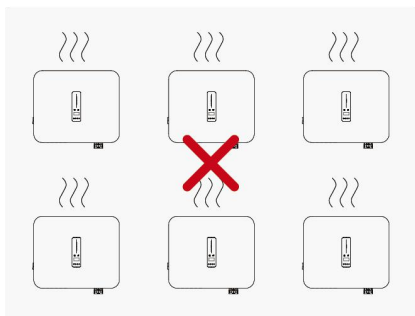
Reserve enough clearance around the inverter to ensure sufficient space for heat dissipation.

Single-unit installation

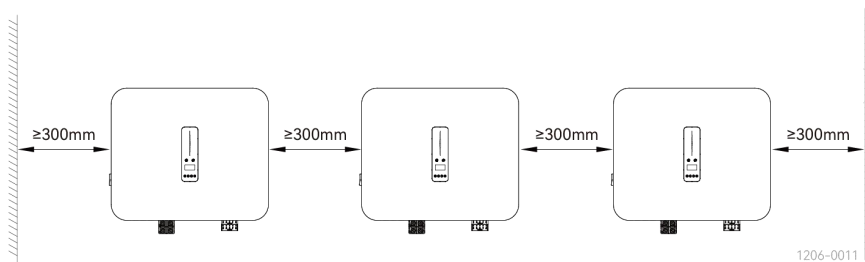


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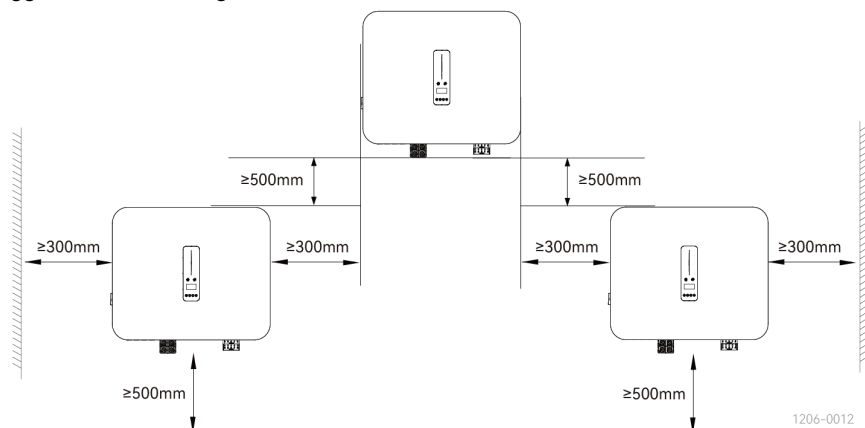
Multi-unit installation



Linear arrangement installation

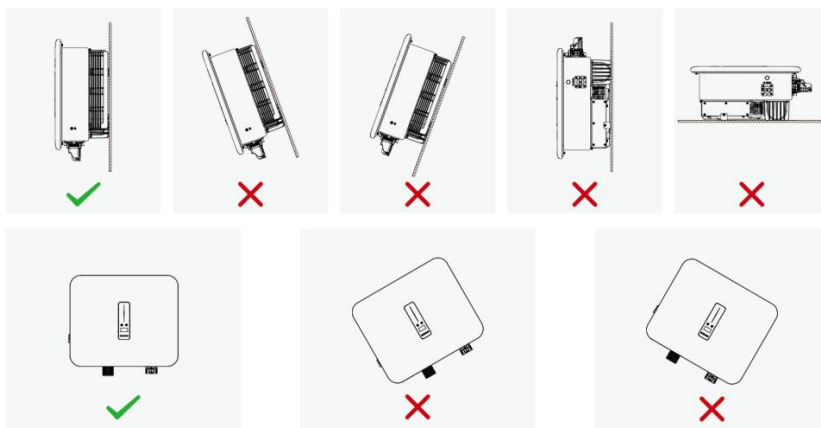


Staggered in-line arrangement installation



5.1.2. Installation Angle

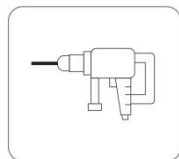
Install the inverter vertically. Never install the inverter horizontally, or at forward/backward tilted, or upside down.



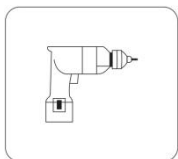
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5.2. Installation Tools & Materials

When installing the inverter, please wear professional protective equipment.



Electric Drill



Electric Screw
Driver



Hammer



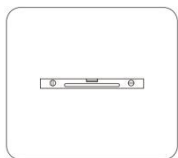
Cross Screw
Driver



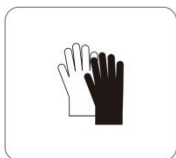
Tape Measure



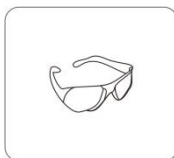
Mark Pencil



Spirit Level



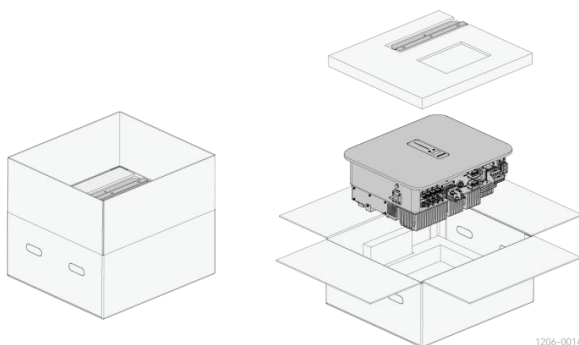
Insulation
Gloves



Goggle

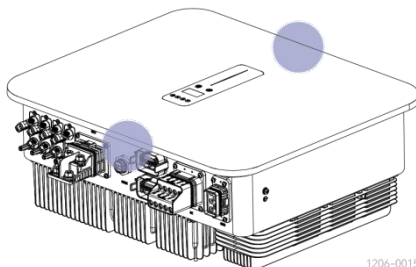
5.3. Moving the inverter

1. Take the inverter out of the packing case.



1206-0014

2. When removing and handling the inverter from the packaging, grasp the handle (as highlighted in the diagram).



1206-0015



CAUTION

Improper handling operations may cause personal injury!

- ✧ Ensure a sufficient number of qualified personnel are involved in handling the inverter based on its weight. All operators must wear appropriate PPE (e.g., impact-resistant footwear, protective gloves).
- ✧ Maintain constant awareness of the inverter's center of gravity during transportation to prevent tilting or imbalance.
- ✧ Place cushioning materials (e.g., foam pads or rubber mats) under the inverter when setting it on rigid surfaces to avoid damage to the metal housing.
- ✧ Always use the designated handles on the product for lifting/movement. Never use the terminals or non-designated components as handholds.

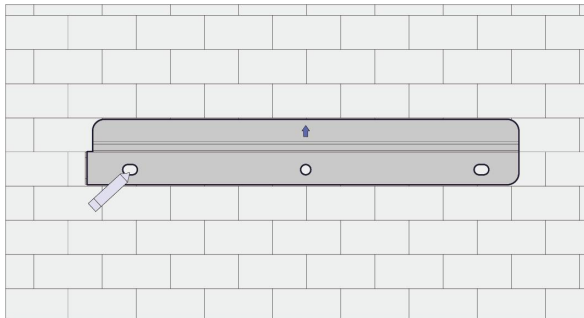
5.4. Bracket Installation Instructions



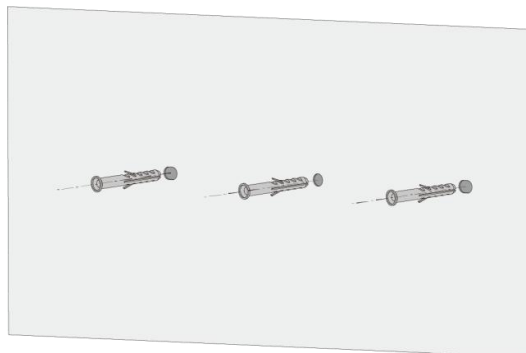
WARNING

- ✧ The machine is heavy. Ensure the installation surface is structurally robust, with a support structure load-bearing capacity of at least four times the inverter weight and dimensional compatibility with the inverter.
- ✧ Do not install on hollow masonry, gypsum board, or similar wall types.

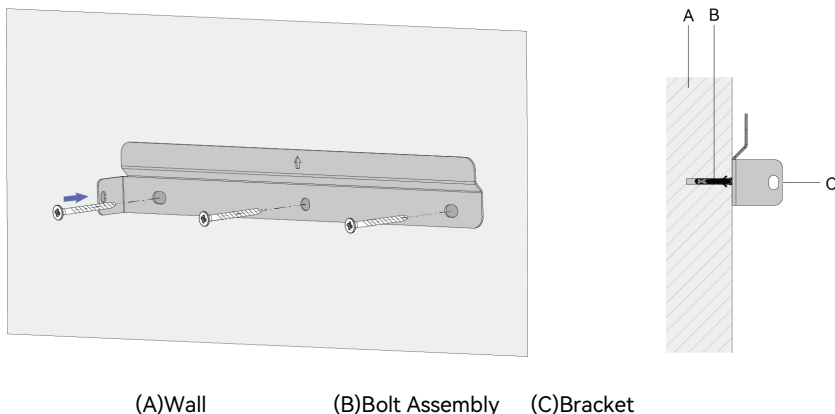
Step 1: Level the inverter bracket with a spirit level, then mark drilling positions on the wall surface.



Step 2: Drill holes using an impact drill, clean the hole positions, then insert the expansion tubes into the holes and secure them with a rubber mallet.

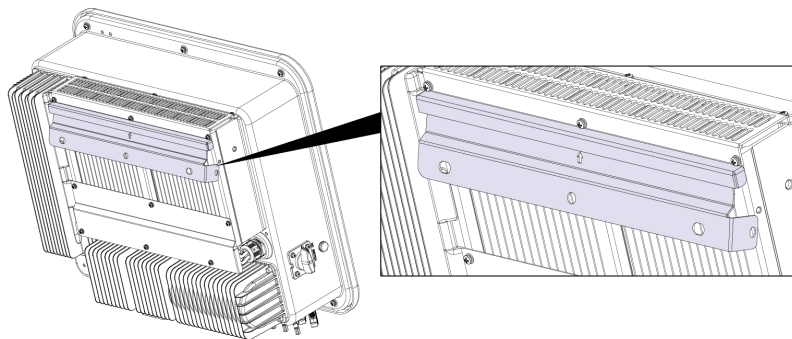


Step 3: Secure the bracket to the wall using screws.

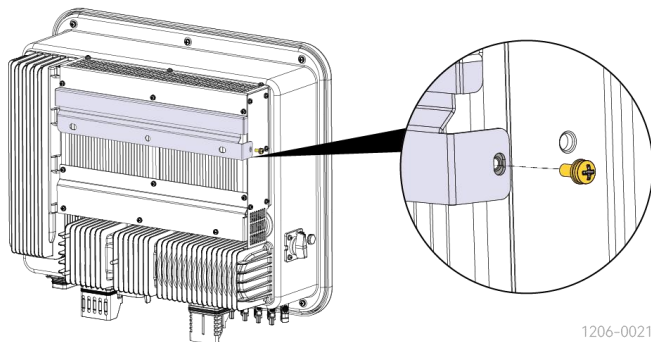


5.5. Installing the Inverter

Step 1: Lift the inverter and carefully align the track slot on its rear with the wall mount bracket.



Step 2: Secure the inverter using screws (recommended torque: $1.5 \pm 0.15 \text{ N} \cdot \text{m}$).



1206-0021

6. Electrical Connection

6.1. Safety Instructions



DANGER

- ✧ When installing the inverter, ensure both the AC side and DC side are completely de-energized to prevent hazardous voltage levels at conductive components that could endanger personnel or equipment.
- ✧ When exposed to light, PV arrays generate dangerous high-voltage DC electricity. Personnel must strictly adhere to installation protocols; non-compliance poses severe electric shock or arc flash risks.
- ✧ The input voltage of PV strings must not exceed the inverter's maximum DC input voltage rating. Damage caused by PV over-voltage will not be covered under warranty.
- ✧ Never connect the neutral conductor (N) to the inverter chassis as a protective earth (PE) conductor. Doing so creates an electric shock hazard due to potential chassis energization.



WARNING

- ✧ Do NOT ground the positive (+) or negative (-) pole of PV strings. Improper grounding may cause catastrophic failure of the inverter's internal components.
- ✧ This inverter is not compatible with PV arrays employing functional earthing as defined in AS/NZS 5033.
- ✧ Electrostatic discharge (ESD) can damage sensitive electronic components. Always implement ESD protective measures during installation and maintenance



CAUTION

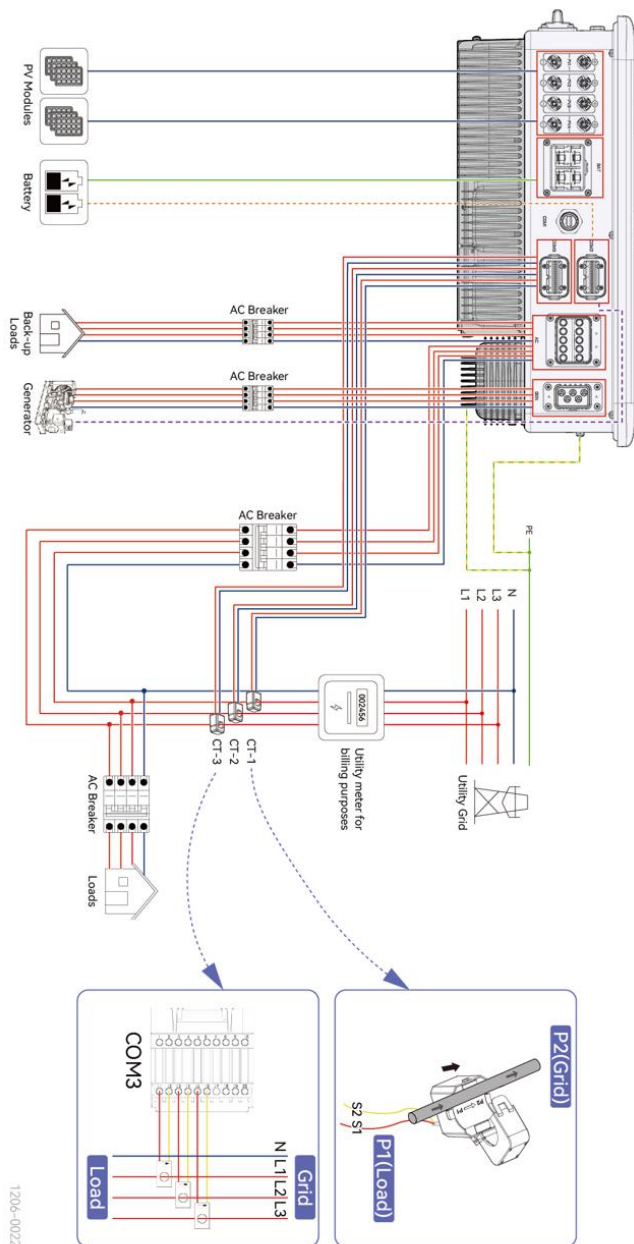
- ✧ Use of terminal lugs (including alternative brands/models) outside the designated accessory kit. Solinteg reserves the right to void warranty coverage for damages caused by terminal incompatibility.
- ✧ Moisture and dust ingress may damage internal components. Ensure cable glands are fully tightened during installation. Warranty claims will be rejected if damage results from improper connector mating.
- ✧ All electrical connections must adhere to local electrical codes.
- ✧ Connecting excessive loads to the backup port will trigger AC output shutdown via overload protection. Please remove some of the load and restart the inverter.

6.2. Electrical Wiring Diagram

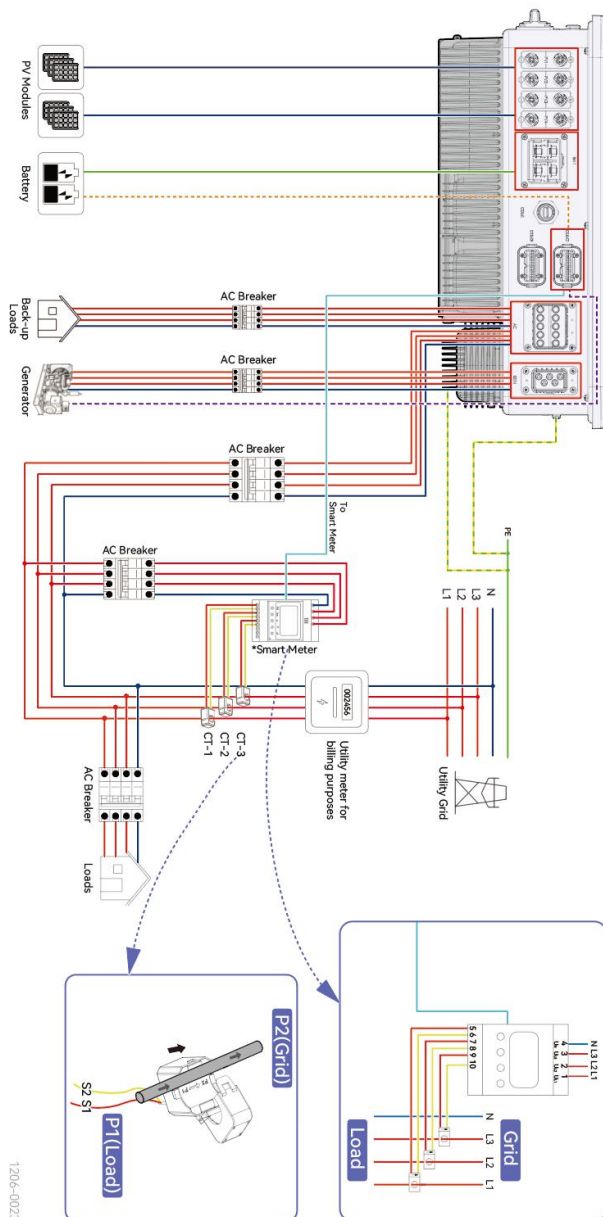
6.2.1. System Connection Diagram

This diagram shows Solinteg M2HT-10~30K-80 series hybrid inverter wiring structure and composition, concerning the real project, the installation and wiring have to be in line with the local standards.

Inverter connects with 3 CT



Inverter connects with smart meter

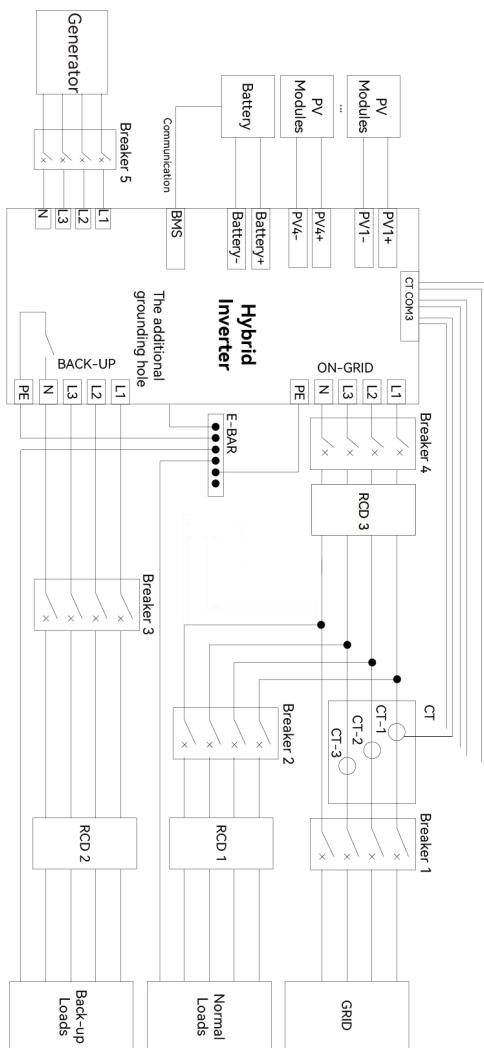


Meter and current transformer (CT) must be purchased separately.

6.2.2. Electrical Connection Diagram

The following block diagram illustrates a typical example of standard electrical connections for a hybrid inverter. Using the current transformer (CT) configuration as an example, the meter connection details can be found in [Section 6.9.2 Inverter connection with smart meter](#).

Scheme 1: Neutral line of AC supply can be isolated or switched. Applicable for most countries.



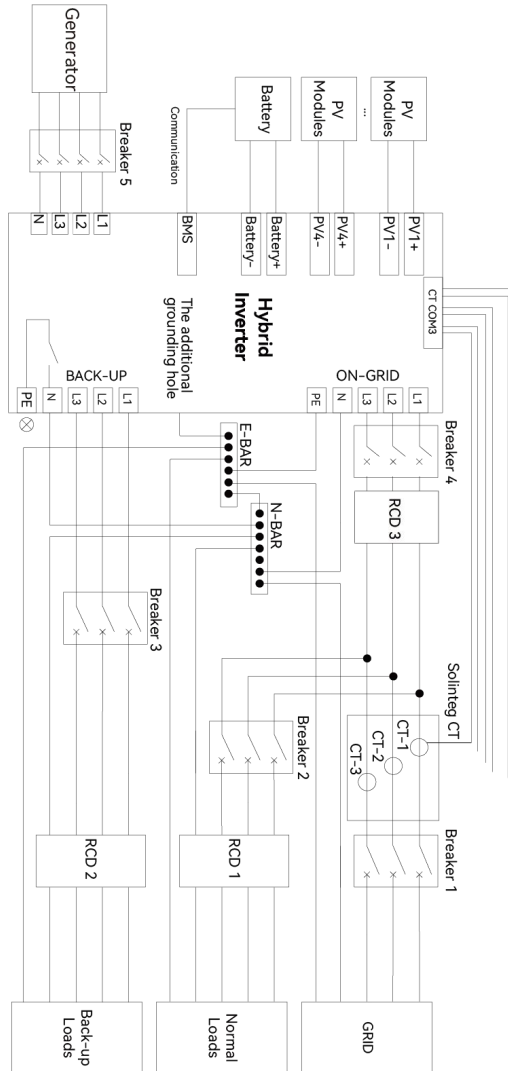
*Please notice the CT direction:
Load → Grid

Scheme 2: Neutral line of AC supply must not be isolated or switched. Applicable for Australia and New Zealand.



CAUTION

The neutral line of On-grid side and Back-up side must be connected together externally to the inverter to ensure the electrical continuity of the neutral line according to the rules AS/NZS_3000. Solinteg is not liable for any responsibility for any consequences arising from non-compliance with this instruction.



*Please notice the CT direction:
Load→Grid

Circuit breaker and RCD

For the electrical block diagram, recommendations for the selection of circuit breakers and residual current devices (RCDs) are as follows: Please make selections based on the actual site conditions and local regulatory requirements.

	M2HT-9.9K M2HT-10K	M2HT-14.9K M2HT-15K	M2HT-19.9K M2HT-20K	M2HT-24.9K M2HT-25K	M2HT-29.9K M2HT-30K
Breaker 1	Depends on household loads and inverter capacity				
Breaker 2	Depends on normal loads				
Breaker 3	20A	32A	40A	50A	63A
Breaker 4	40A	63A	80A	100A	100A
Breaker 5	20A	32A	40A	50A	63A
RCD 1 RCD 2	30mA type A(Comply with local regulation)				
RCD 3	The inverter is equipped with a residual current monitoring unit (RCMU), which will immediately disconnect from the grid upon detecting a fault current exceeding the threshold. If an additional standalone residual current device (RCD) is installed, a Type A RCD is recommended, with a tripping current of 100 mA.				

Circuit breaker specifications and cable specifications must be matched. If a smaller cable size is selected, use a circuit breaker with a lower trip current accordingly.

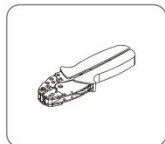
According to IEC 62477, the inverter's "Conditional Short-Circuit Current" and "Minimum Required Prospective Short-Circuit Current" are as follows:

	M2HT-9.9K M2HT-10K	M2HT-14.9K M2HT-15K	M2HT-19.9K M2HT-20K	M2HT-24.9K M2HT-25K	M2HT-29.9K M2HT-30K
Conditional Short-Circuit Current (kA)	6	6	6	6	6
Minimum Required Prospective Short-Circuit Current (kA)	0.24	0.38	0.48	0.6	0.76

6.3. Wiring Tools and Materials

Before performing electrical connections, prepare the following materials:

- ✧ Inverter accessory kit.
- ✧ Cables: AC cables, DC cables, communication cables, grounding cables. (Please prepare suitable cables according to actual conditions)
- ✧ Wiring tools:



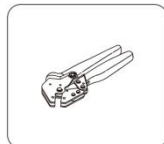
Wire strippers



Wire cutters



Crimping pliers



RJ45 connector
crimping pliers



Multimeter (DC
range >1100V)



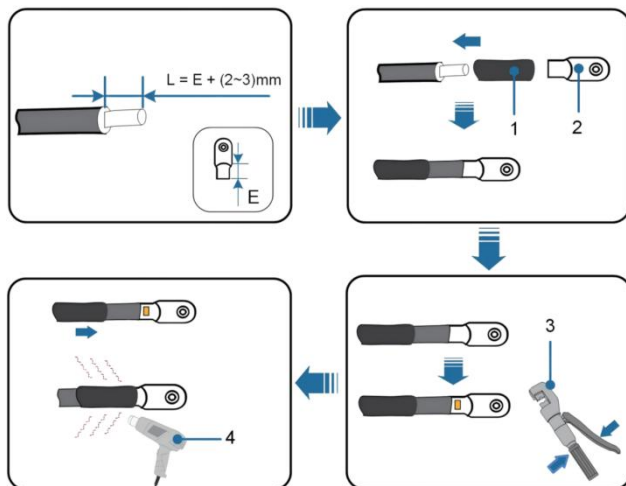
Screwdriver



Allen socket
wrench

6.4. OT/DT and Cold-pressed Terminals

6.4.1. Crimping OT/DT Terminals



(1)Heat Shrink Tubing

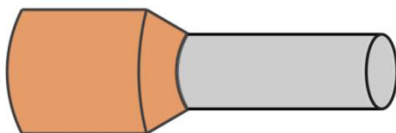
(2)OT/DT Terminals

(3)Hydraulic Crimping Tool

(4)Heat Gun

6.4.2. Cold-pressed Terminals

If flexible copper cables are used during on-site installation, please use the following cold-pressed terminals.



NOTE

If rigid copper cables with a low strand count and individual strand diameters exceeding 1.7mm are used on-site, it is recommended to strip the insulation layer and directly terminate the conductor to the terminal.

6.5. External Grounding Connection

Connect the inverter and ground bar through PE wire to achieve the purpose of grounding protection. Please always remember wiring the PE wire before wiring other wires.



DANGER

Do not connect the N-wire as a protective ground wire to the inverter casing. Otherwise, it may cause electric shock.



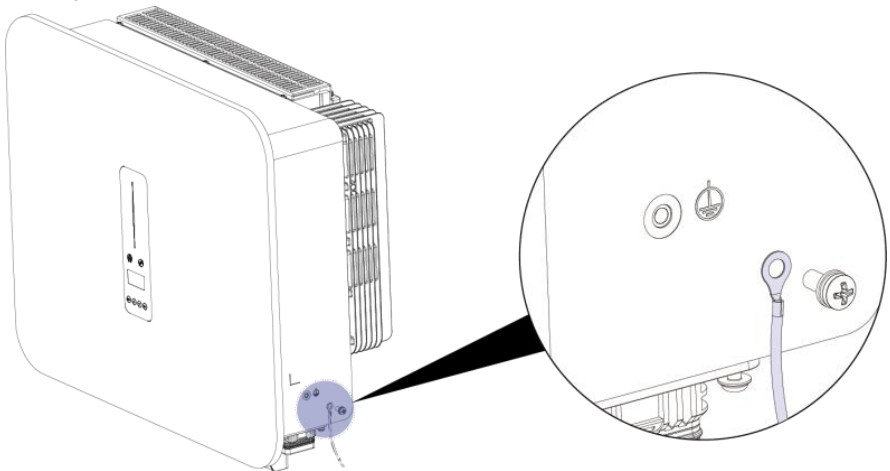
CAUTION

- ◇ Single-inverter system: Ground the PE conductor only.
- ◇ Multi-inverter system: All inverters' PE conductors must be connected to the same grounding copper busbar to ensure equipotential bonding.
- ◇ Reliable grounding is good for resisting surge voltage shock and improving EMI performance.
- ◇ According to the French UTE C15-712-1 standard, the inverter's grounding conductor should be connected to the equipotential bonding point via a conductor with a minimum cross-sectional area of 6mm^2 of copper (Cu) or an equivalent conductor (PE conductor), and it should also be connected to the protective conductor of the AC part.

Ground terminal connection steps:

Step1: The external grounding terminal is located at the lower right side of the inverter.

Step2: Use a crimping plier to crimp the PE conductor into the OT terminal. Then, use a screwdriver to secure the OT terminal onto the inverter's external grounding bolt (recommended torque: $1.5 \pm 0.15\text{N} \cdot \text{m}$). Connect the other end of the PE conductor to the grounding copper bus bar.



6.6. AC Connection



DANGER

High Voltage Danger!

- ✧ Ensure all cables are voltage-free before electrical connection.
- ✧ Do not close the AC-side circuit breaker until all electrical connections are completed.



WARNING

- ✧ Before making the connection of AC cable, please confirm all DC & AC power source are disconnected from the inverter.
- ✧ Do not connect the AC cables in the incorrect phase order. Please refer to the labels on the AC connectors.
- ✧ An independent AC breaker is required on the on-grid side, the back-up side, and the generator side, and any loads cannot be connected with inverter directly.
- ✧ Refer to the specification manual for the inverter's applicable voltage and frequency.
- ✧ Obtain the local utility company's permission before connecting the inverter to the grid.



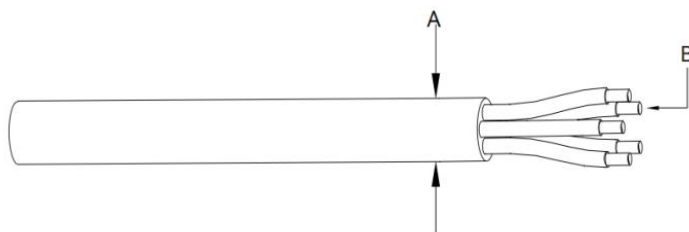
NOTE

In accordance with regulatory requirements in Germany, Austria and other countries, when the inverter operates in off-grid mode, it is necessary to ensure that the neutral (N) line on the Back-up side is grounded to ensure user electrical safety. Once the inverter's "N-PE Check" function is enabled, it will connect the N line to the protective earth (PE) line when operating in off-grid mode, and it will automatically disconnect the N line from the PE line when operating in on-grid mode. Therefore, the PE terminal on the backup side must be properly connected to the grounding copper busbar, achieving bonding between the N conductor and the PE conductor to ensure electrical safety.

6.6.1. Cable Preparation

Please select the appropriate cable specifications based on actual conditions. The recommended specifications are as follows:

	Name	Cable outer diameter (A)	Conductor cross-sectional area (B)
On-grid side	4/5-Core AC Cable	12.5-27.0mm	16-25 mm ²
Back-up side	4/5-Core AC Cable	12.5-27.0mm	16-25 mm ²
Generator side	4/5-Core AC Cable	≤24mm	≤16mm ²
Ground	Single-core cable	4.5-6mm	6-10mm ²



6.6.2. On-grid and Back-up side connection



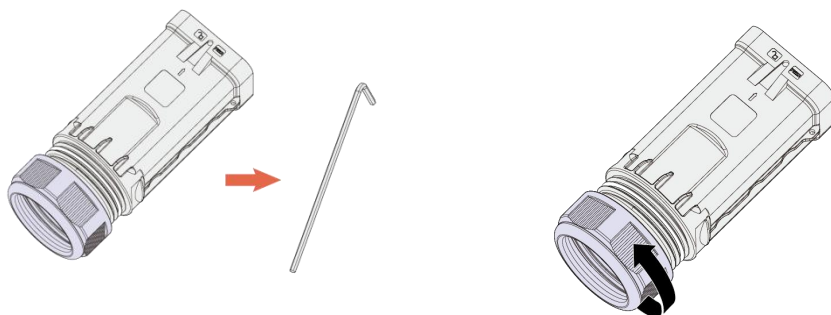
NOTE

Please connect the On-grid side cables first, then connect the Back-up side cables.

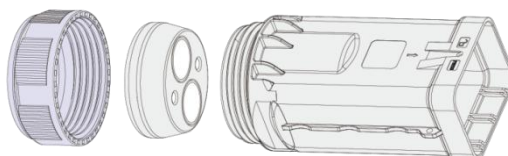
Connect the On-grid and Back-up ports separately according to the following steps.

Step 1: Remove the built-in wrench from the connector.

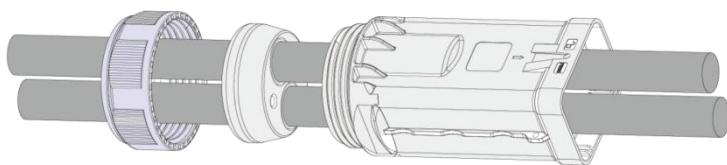
Step 2: Unscrew the lock nut from the connector.



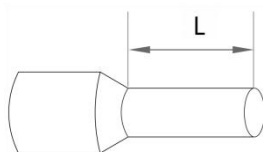
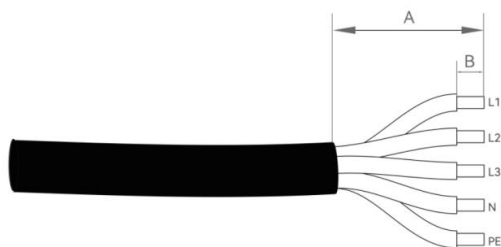
Step 3: Remove the sealing washer from the lock nut.



Step 4: Pass the appropriately sized cable through the lock nut, sealing washer, and housing in sequence.



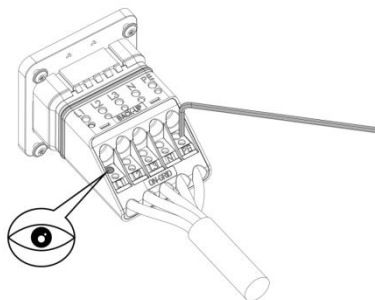
Step 5: Strip the outer cable sheath, then remove the insulation layer of the conductors. If flexible copper cables are used, please use the cold-pressed terminals. If the cold-pressed terminal is not used, strip the cable by 18~20 mm.



$A=60-65\text{mm}$, $B=L+2\sim 3\text{mm}/18\sim 20\text{ mm}$

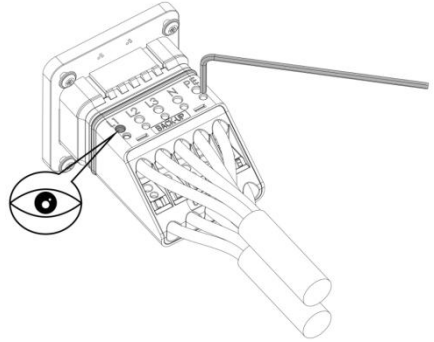
Step 6:

Insert the On-grid side cable into the inverter's On-grid side terminal first. Observe the viewing window to confirm proper cable alignment, then tighten the screws (recommended torque: $2.0\pm 0.1\text{N}\cdot\text{m}$).



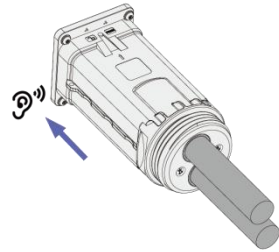
Step 7:

Insert the Back-up side cable into the inverter's Back-up side terminal. Observe the viewing window to confirm proper cable alignment, then tighten the screws (recommended torque: $2.0 \pm 0.1 \text{ N} \cdot \text{m}$).

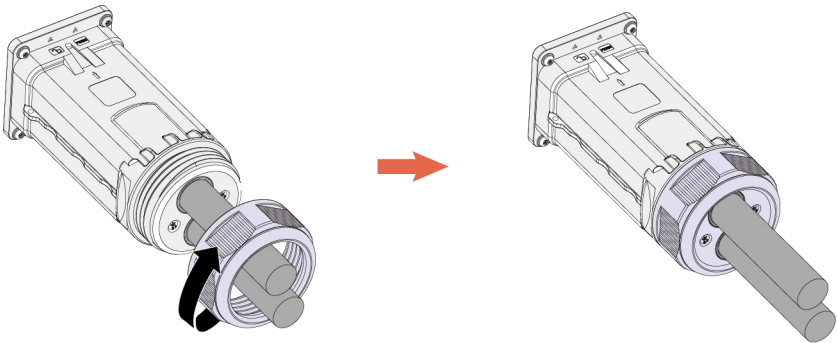


Step 8:

Plug the connector into the inverter port until a "click" sound is heard.



Step 9: Use an open-end wrench to tighten the nut and complete the installation.

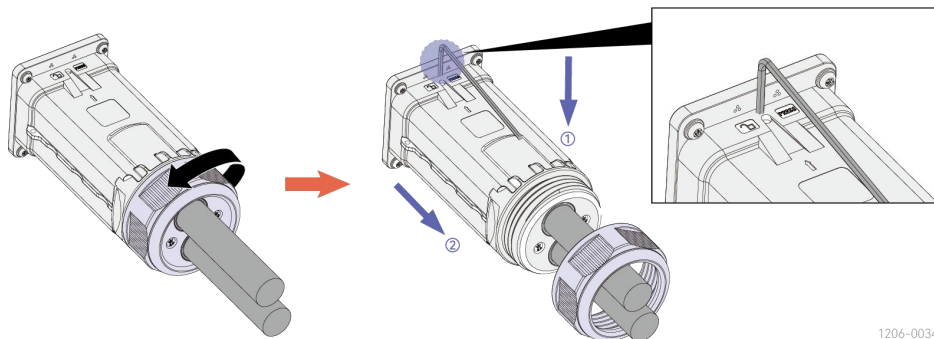


1206-0033

Disassembly Steps

Step 1: Rotate the nut in the reverse direction.

Step 2: Use the built-in wrench to press the unlock position, and hold the connector to pull it backward to complete the removal.



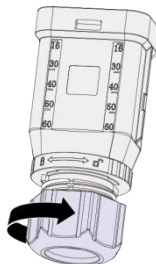
1206-0034

6.6.3. Generator side connection

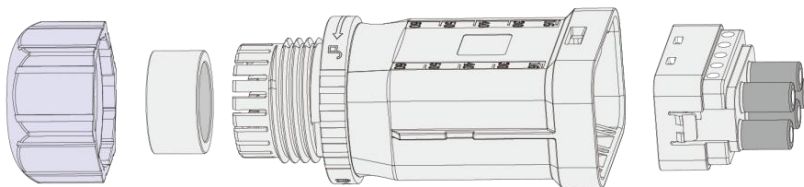
Connect the generator ports according to the following steps.

Step 1:

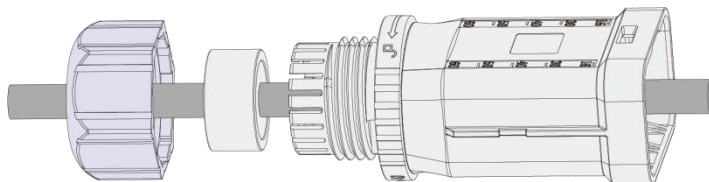
Unscrew the lock nut from the connector.



Step 2: Cut out appropriate holes on the sealing ring based on the cable diameter.



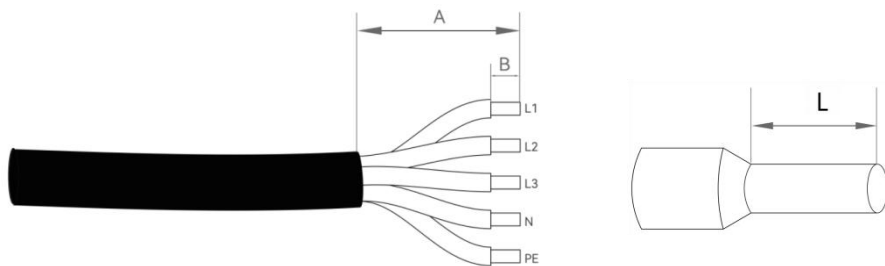
Step 3: Pass the appropriately sized cable through the lock nut, sealing washer, and housing in sequence.



Step 4: Strip the outer cable sheath, then remove the insulation layer of the conductors. If

flexible copper cables are used, please use the cold-pressed terminals.

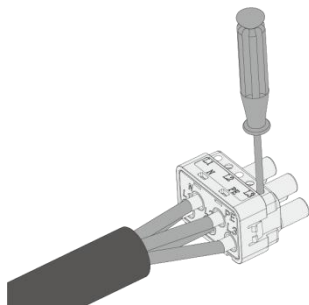
If the cold-pressed terminal is not used, strip the cable by 16 ± 1 mm.



$A = 60 \pm 2 \text{ mm}$, $B = L + 2 \sim 3 \text{ mm}$ or $16 \pm 1 \text{ mm}$

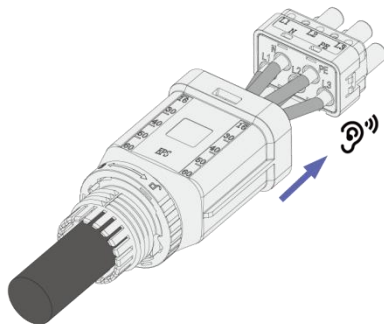
Step 5:

Insert the cables into the connector insert in wire sequence order, ensuring the insulation terminals are flush with the insert surface; torque the terminal screws to $2.0 \pm 0.1 \text{ N} \cdot \text{m}$.



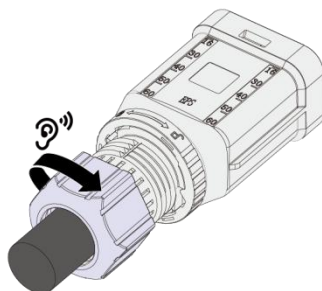
Step 6:

Insert the housing into the connector insert until fully seated with an audible click.

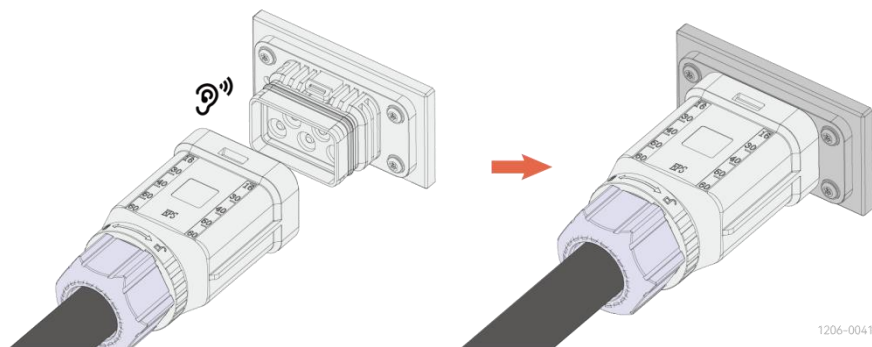


Step 7:

Tighten the nut using an open-end wrench until audible clicks are achieved.

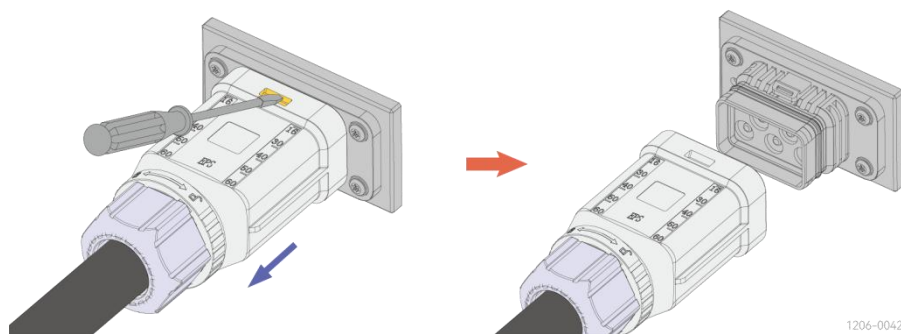


Step 8: Insert the terminal into the inverter port until an audible click confirms secure engagement.

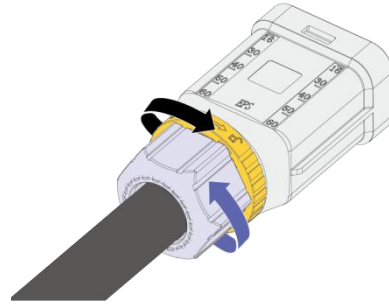


Disassembly Steps

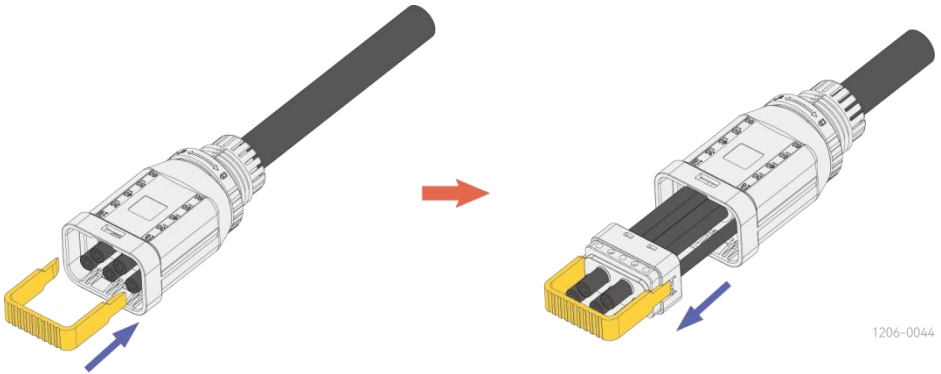
Step 1: Align the screwdriver with the release position, press and hold the terminal, then withdraw it axially to disengage from the inverter port.



Step 2: Rotate the release latch along the indicated arrow direction with one hand while counter-rotating the nut with the other hand.



Step 3: Insert the unlock tool into the terminal and disengage the wiring assembly from the housing shell.



1206-0044

6.7. PV String Connection



DANGER

When exposed to sunlight, the PV array generates dangerous high DC voltage. Please operate according to our instructions, or it will result in danger to life.



WARNING

- ✧ Do not reverse the positive and negative poles of the PV string. Please check the polarity of the PV string first, and after ensuring the correct polarity, connect the PV string to the corresponding terminals of the inverter.
- ✧ Please ensure that the PV connectors are securely connected to the inverter connectors to prevent overheating or arcing after long-term use.
- ✧ If the DC input cables are connected in reverse or both the positive and negative poles of different MPPTs experience ground faults simultaneously while the DC switch is set to "ON", do not proceed immediately. This may damage the product. Wait until the string current drops below 0.5A, then rotate the DC switch to "OFF" and disconnect the DC connector to correct the string polarity.

- ✧ Before connecting PV strings to the inverter, verify the insulation impedance of each string to ground to ensure safe operation and normal inverter functionality.



CAUTION

- ✧ The maximum PV input voltage of the inverter is 950V. If the voltage is greater than 950V but less than 1000V, the inverter will enter standby mode. Voltages greater than 1000V can cause damage to the inverter.
- ✧ PV strings connected to the same MPPT path must use photovoltaic modules of the same model and quantity.
- ✧ The voltage difference between different MPPT paths must be less than 200V.
- ✧ Please use the PV connectors provided with the inverter. If lost or damaged, replacement connectors of the same model must be purchased. Equipment damage caused by using incompatible PV connectors is not covered under warranty.
- ✧ During on-site wiring, the DC input cables should hang naturally by at least 150mm. The axial pulling force on the PV connectors must not exceed 80N. Radial stress or torque on the PV connectors is strictly prohibited.
- ✧ Do not operate if connectors are not fully engaged. Connector damage caused by incomplete engagement is not covered under warranty.



NOTE

- ✧ The brand, model, installation angle, and string voltage of the PV modules connected to the same MPPT should be consistent; otherwise, it may affect the power generation of the inverter.
- ✧ The string configuration voltage must exceed the MPPT voltage lower limit under full load.

6.7.1. PV Side Requirements

Cable Preparation

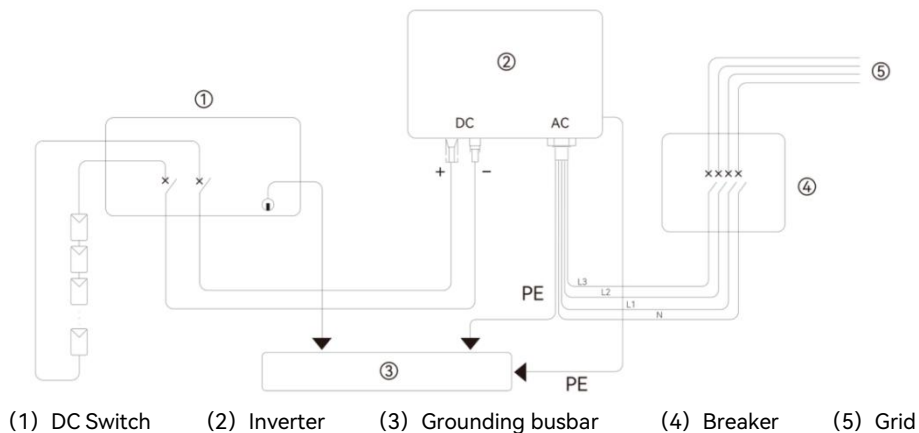
Please select the appropriate cable specifications based on actual conditions. The recommended specifications are as follows:

Name	Outside diameter	Conductor cross-section
DC Cable	5.9-8.8mm	4mm ² (12AWG) or 6mm ² (10AWG)

System Layout of Units with external DC Switch

Local standards or regulations may require that PV systems install an external DC switch on the DC side of the inverter to ensure isolation.

The DC switch has to be certified by AS 60947.3 and AS/NZS IEC 60947.1 in Australia and New Zealand market. Please refer to the maximum short-circuit current on the inverter DC side to select the appropriate DC switch specifications. We recommend the following electrical connection.



6.7.2. Wiring Procedure



WARNING

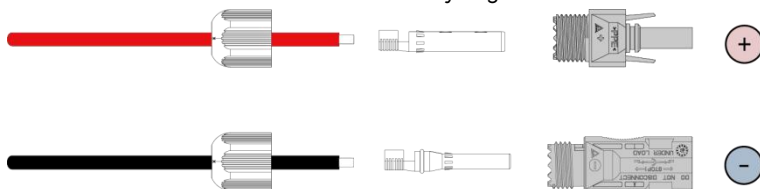
Before assembling the DC connector, make sure that the cable polarity is correct.

Assembling the PV Connector

Step 1: Peel off the DC cable insulation sleeve for 7 mm.

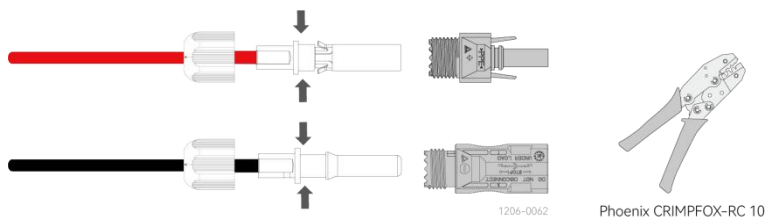


Step 2: Disassemble the PV connector in the accessory bag.



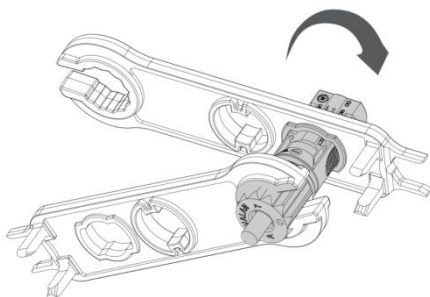
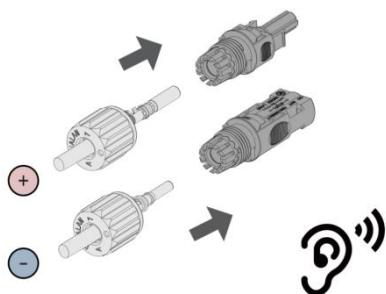
1206-0061

Step 3: Insert the DC cable through the DC connector nut into the metal terminal and press the terminal with a professional crimping plier, with the "Phoenix CRIMPFOX-RC 10" being the recommended choice. Pull back the cable with some power to check if the terminal is well connected to the cable.



Step 4: Insert the positive and negative cables into the corresponding positive and negative connectors, pull back the DC cable to ensure that the terminal is tightly attached in the connector.

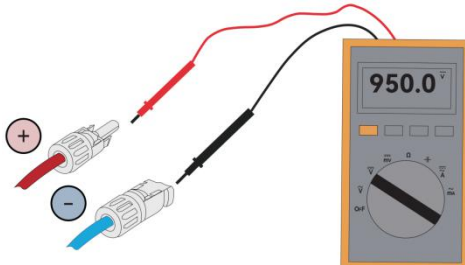
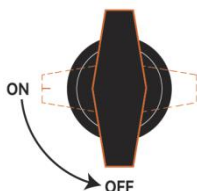
Step 5: To ensure proper sealing of the terminal, use an open-end wrench to securely tighten the nut to the end.



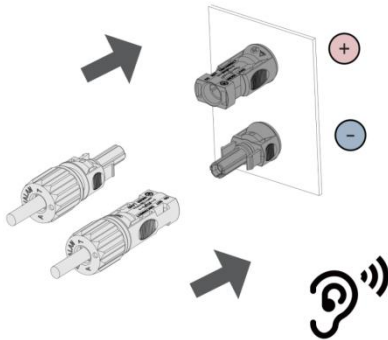
Installing the PV Connector

Step 1: Rotate the DC switch to "OFF" position.

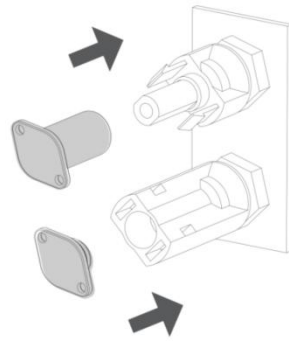
Step 2: Check whether the cable polarity of the PV string is correct. The maximum input voltage for the PV string is 950V. If the voltage of PV string ranges from 950V to 1000V, the inverter will enter standby mode. Exceeding 1000V will result in inverter damage.



Step 3: Insert the positive and negative connectors into the inverter DC input terminals respectively, a click sound should be heard if the terminals are well connected.



Step 4: Seal the unused PV terminals with the terminal caps.



6.8. Battery Connection

This section provides an overview of the battery connection procedures on the inverter side. For details on the battery side connections and configurations, consult the instructions supplied by the battery manufacturer.



WARNING

- ✧ Please disconnect the AC-side circuit breaker and the battery-side circuit breaker, and set the inverter DC switch to the OFF position before connecting the battery to avoid electric shock.
- ✧ When connecting the battery, ensure that the positive and negative polarities are correct.



CAUTION

- ✧ The maximum input voltage on the inverter's battery side is 900V. Do not connect a battery with a voltage exceeding 900V.
- ✧ In the external battery circuit, fuses (or DC breaker) must be installed on both the positive and negative poles.



NOTE

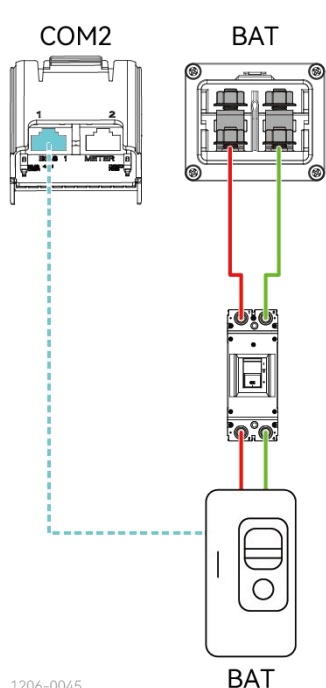
- ✧ The inverter cannot operate off the power grid if no battery is connected.
- ✧ The inverter is compatible with high-voltage lithium-ion batteries equipped with a BMS module. Connection of other battery types is not supported.
- ✧ Batteries must undergo matching tests with the inverter prior to operation; otherwise, the system may experience functional anomalies. For the compatible battery list, contact the Solinteg service team. If battery models not listed in the compatible battery list are used, the inverter warranty service will be automatically voided.

6.8.1. Wiring Schemes

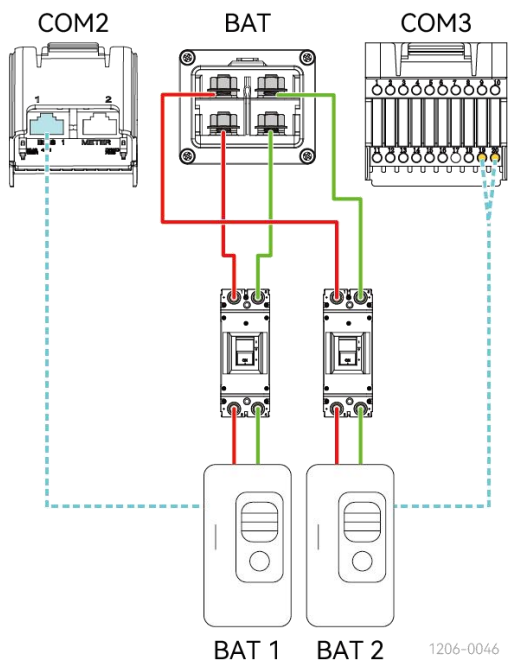
The inverter has two battery ports, which can support a single battery bank or independently connect two separate battery banks. Recommended configurations are as follows:

Scheme	Battery Ports	BMS Communication Port
Single battery bank	DC1 and DC2 in Parallel	BMS1
Dual battery banks in independent connection	DC1	BMS1
	DC2	BMS2

Single battery bank

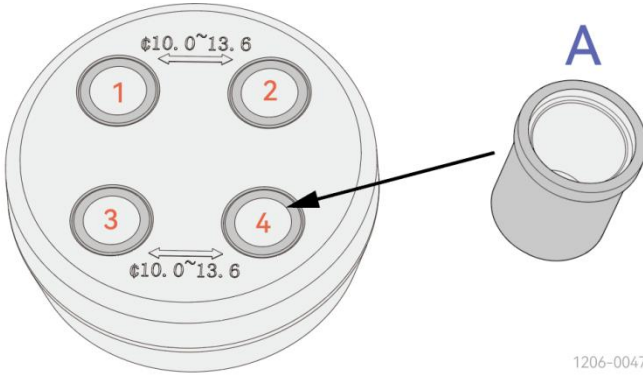


Dual battery banks in independent connection



6.8.2. Cable Preparation

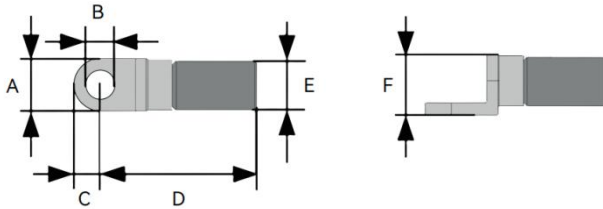
Compatible cable specifications for the waterproof seals are as follows:



Hole	Cable Outer Diameter (mm)		Cross-sectional Area (mm ²)
1/2/3/4	7.5-8.5 (Part A)	10.0-13.6 (No parts)	16-50

6.8.3. OT/DT Terminals

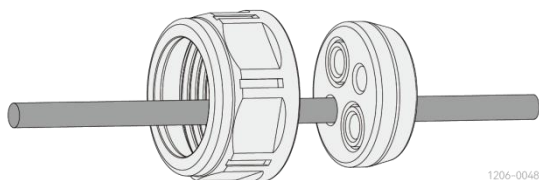
Fixing the DC cable to the terminal block requires the use of OT/DT terminals (not included in the delivery range). Please purchase in accordance with the following requirements.



Item	A	B	C	D	E	F
Dimensional(mm)	≤24.0	Ø8.5	≤12.0	≤45.0	≤17.0	≤17.0

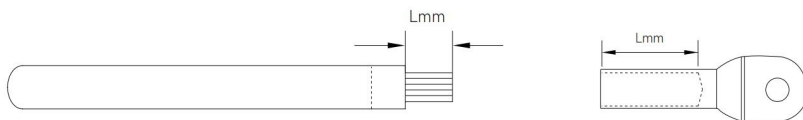
6.8.4. Wiring Procedures

Step 1: Pass the battery cables through the waterproof gland.

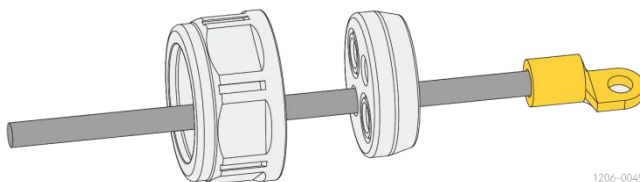


1206-0048

Step 2: Strip the insulation sleeve from the battery cables to the specified length.



Step 3: Use a hydraulic crimping tool to connect the cables to OT terminals.



1206-0049

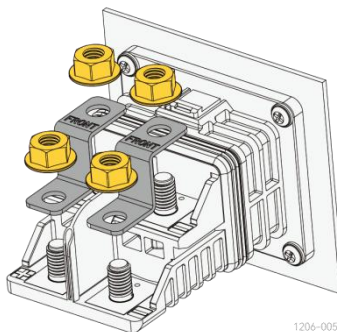


WARNING

The inverter is shipped by default in a parallel connection configuration. If two battery banks are connected independently, the battery jumper plate must be removed.

Step 4:

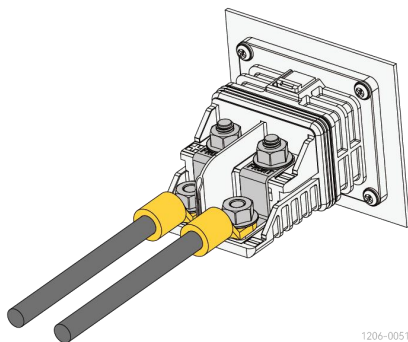
For independent connection of dual battery banks, remove the parallel copper busbar between the battery terminals.



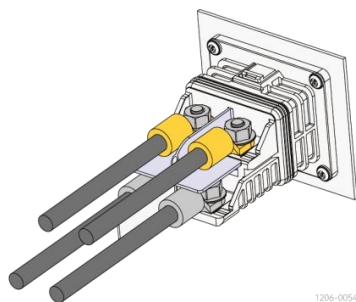
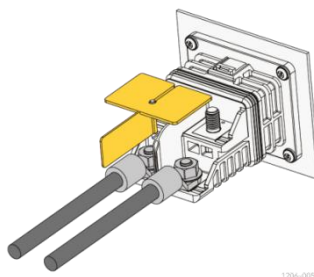
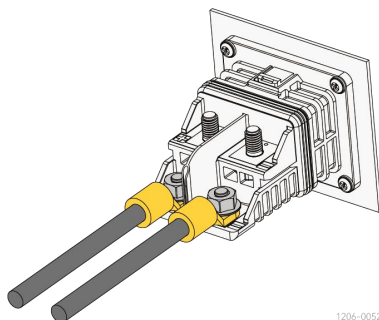
1206-0050

Step 5: After removing the nuts, install the OT terminals according to polarity.

Parallel Battery Connection

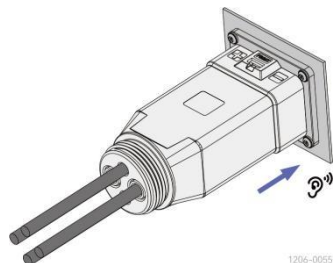


Independent Battery Connection

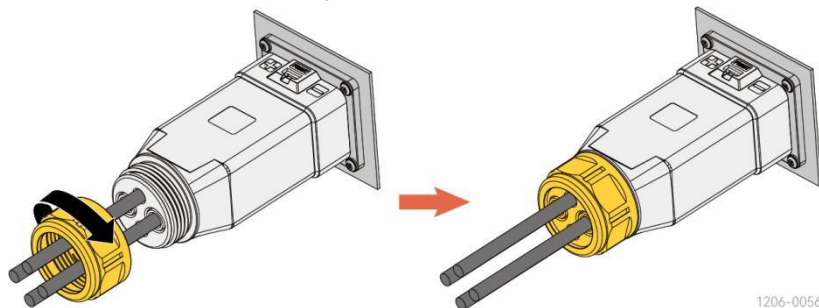


Step 6:

Plug the connector into the inverter port until a "click" sound is heard.



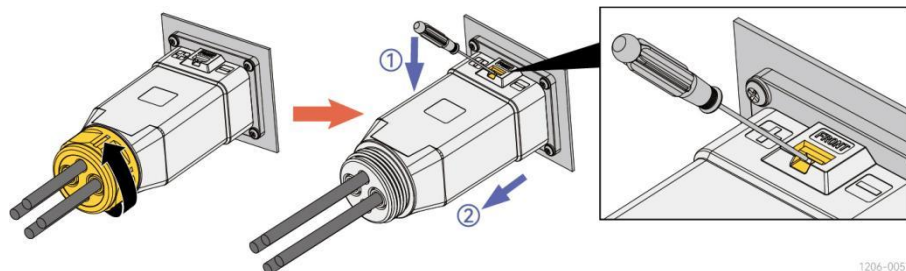
Step 7: Use an open-end wrench to tighten the nut and complete the installation.



6.8.5. Disassembly Steps

Step 1: Rotate the nut in the reverse direction.

Step 2: Use a small flat-head screwdriver to press the unlock position, and hold the connector body to pull it backward to remove it, thus completing the detachment.

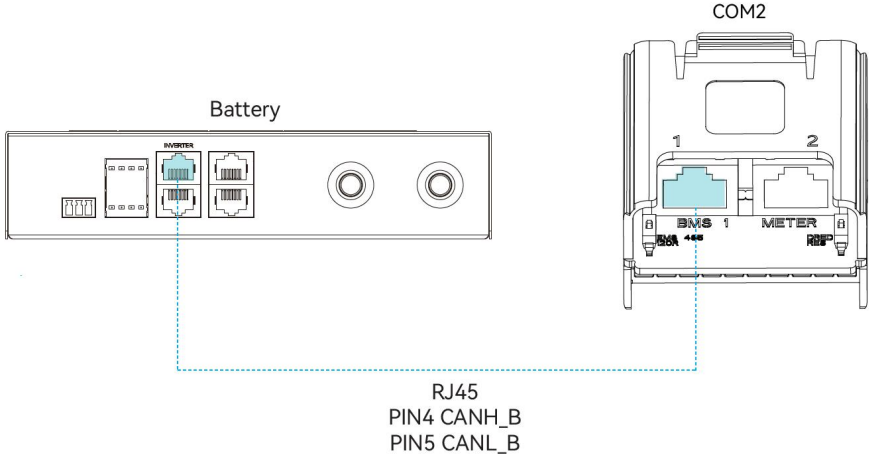


6.8.6. Battery Communication Wiring

The inverter communicates with the battery BMS via a CAN communication cable.

The BMS wiring terminal is located on the back of COM2. Refer to Section [7.2.1 Port Definition](#) for the pinout definition.

Refer to Section [7.2.2 Wiring Procedure](#) for the specific wiring method.



CAUTION

Unused pin terminals and cables in the battery communication line must not be grounded or connected to other devices.

6.9. Meter and CT Connection

The inverter requires installation of a current transformer (CT) or a smart meter (with CT) to enable functionalities such as load power detection, anti-islanding, and power dispatch.

CTs or meters are typically installed inside the AC distribution panel. The CT should be installed on the L line between the grid and the On-grid side load.

The CT or meter ships with the inverter in the accessory box.

The inverter connects to the CT via the COM3 port and to the meter via the COM2 port. Port definitions for COM3 and COM2 are detailed in [Section 7.2.1 Port Definition](#).

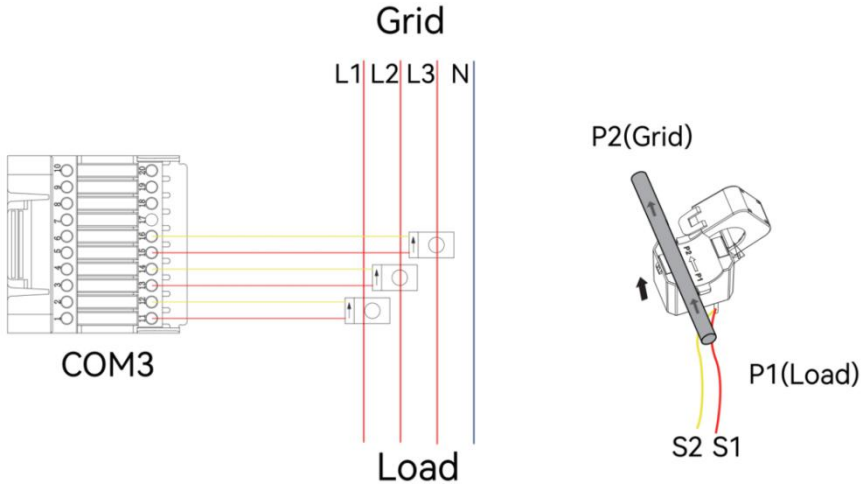


WARNING

When the primary side of a current transformer remains energized and carries load current, its secondary circuit must never be left open! An open secondary winding will induce dangerously high voltages across its terminals, which can cause severe equipment damage, component breakdown, and potentially lethal electric shock to personnel!

6.9.1. Inverter connection with CT (100mA)

Please refer to the following schematic diagram for connecting the CT (100mA).

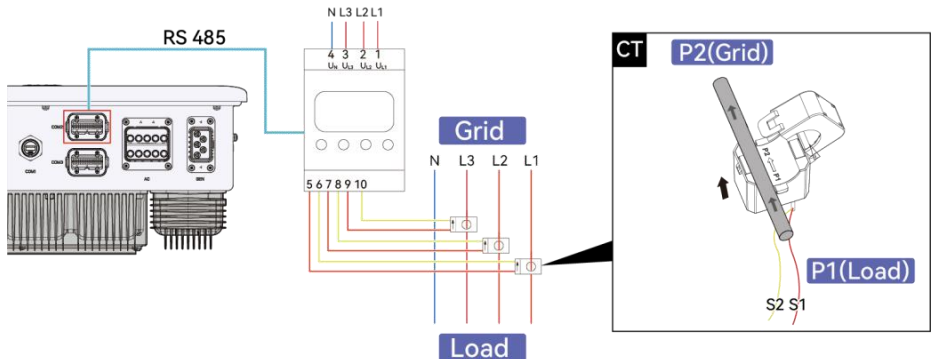


NOTE

- ✧ Install the CT according to the arrow marking on the CT (P1 Load → P2 Grid).
- ✧ The CT directly connected to the inverter must only use the CT with a 100mA output provided by Solinteg.
- ✧ Please set the CT ratio on the inverter.

6.9.2. Inverter connection with smart meter

The inverter comes with a standard CT configuration. If a meter connection configuration is required, the Solinteg RMM series meter must be ordered separately. Please follow the wiring diagram below for meter and CT installation.



NOTE

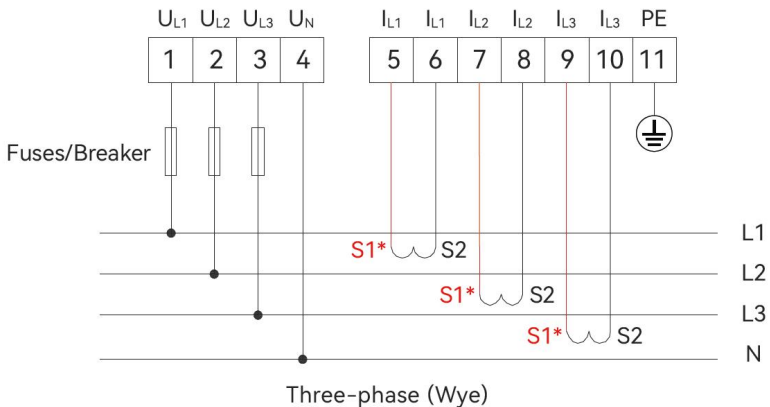
- ✧ Install the CT according to the arrow marking on the CT (P1 Load → P2 Grid).
- ✧ Use only Solinteg-approved meters. Unauthorized meters may not function properly.
- ✧ Install a circuit breaker or fuse in the AC-side circuit of the meter.

- ✧ Customers must purchase Class 0.5 (or higher) CTs separately. Please set the CT ratio on the meter.
- ✧ Refer to the meter manual for detailed usage instructions.

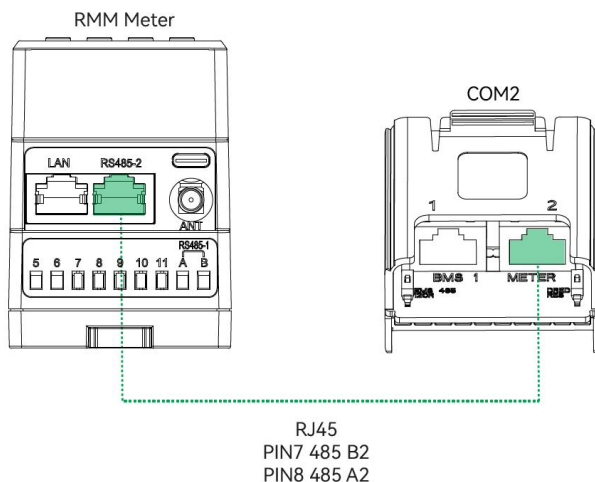
The terminals definitions for the Solinteg RMM three-phase smart meter are as follows

Item	Definition	Function
1	UL1	L1/L2/L3/N connect to grid to detect power grid voltage
2	UL2	
3	UL3	
4	UN	
5	IL1*-S1	To detect the CT current and direction
6	IL1-S2	
7	IL2*-S1	
8	IL2-S2	
9	IL3*-S1	
10	IL3-S2	
11	PE	Ground connection
RS485	RS485-1	/
	RS485-2	Communicate with hybrid inverter
ANT	/	/
LAN	/	/
Type-C	/	/

Select a proper system schematic diagram based on the actual situation.



The inverter communicates with the smart meter through the RS485 communication line. The RJ45 terminal block of the power meter is located at COM2. Please refer to Section [7.2.1 Port Definition](#) for pin definitions. The wiring diagram is shown below.



6.10. Parallel and Generator Systems

This feature is in planned/development status and has not yet been officially implemented. The actual release timeline is subject to the definitive guidance provided in our official solution documentation.

Parallel Systems

A parallel system must meet the following conditions:

- ✧ All inverters in the parallel system must be of the same model.
- ✧ Each inverter must have an independent battery of identical capacity (No battery mode is unsupported).
- ✧ The photovoltaic capacity connected to each inverter must be approximately equal.
- ✧ Each inverter must be equipped with a communication module.
- ✧ An independent circuit breaker must be installed on the AC output side of each inverter.

- ✧ The parallel system operates in a master-slave configuration. One inverter must be designated as the master (via the screen or monitoring platform), with the remaining inverters set as slaves.
- ✧ Inverters communicate via CAN bus. The Sync 120R and PAR CAN 120R DIP switches for terminal resistors on the first and last inverters must be set to "ON".
- ✧ Only the master inverter requires connection to a meter or CT.
- ✧ The current configuration supports parallel operation of 10 units in grid-connected mode and 2 units in off-grid mode.



NOTE

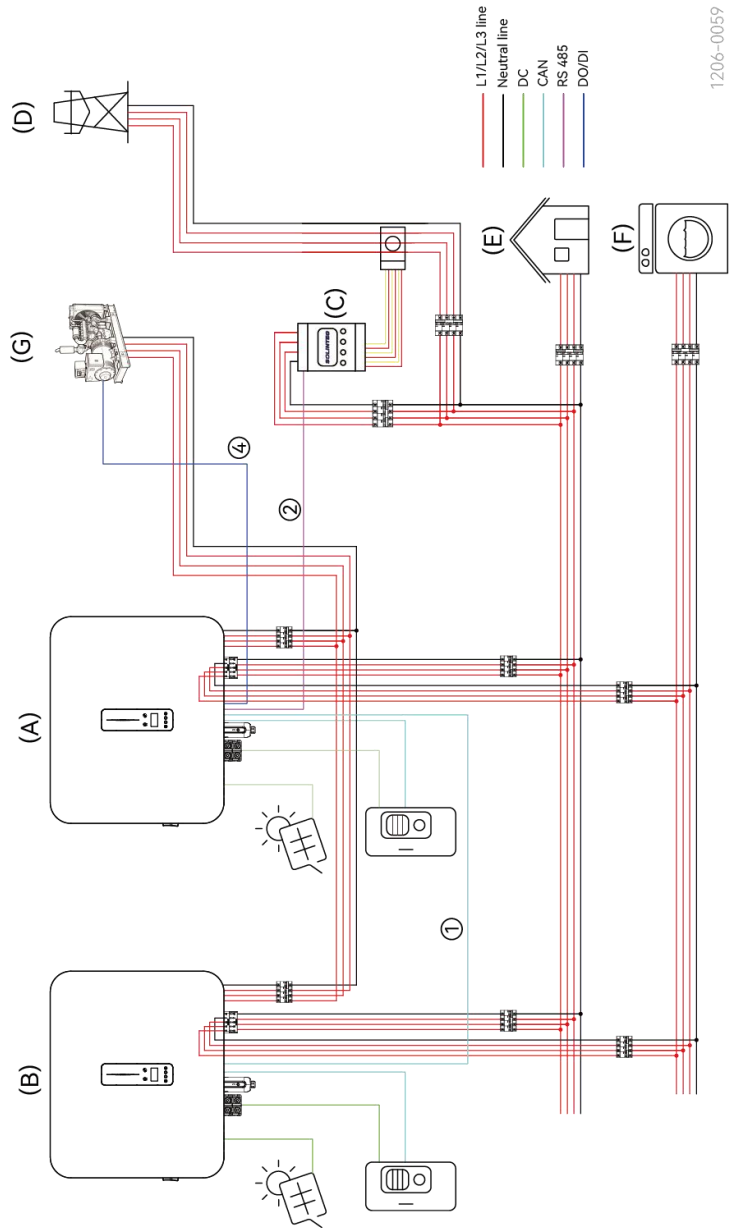
Failure to meet the above conditions may result in system malfunction or suboptimal operation.

Generator System

For installations involving up to and including two inverter units, direct generator interface is achievable via the dedicated Generator Terminal (GEN port).

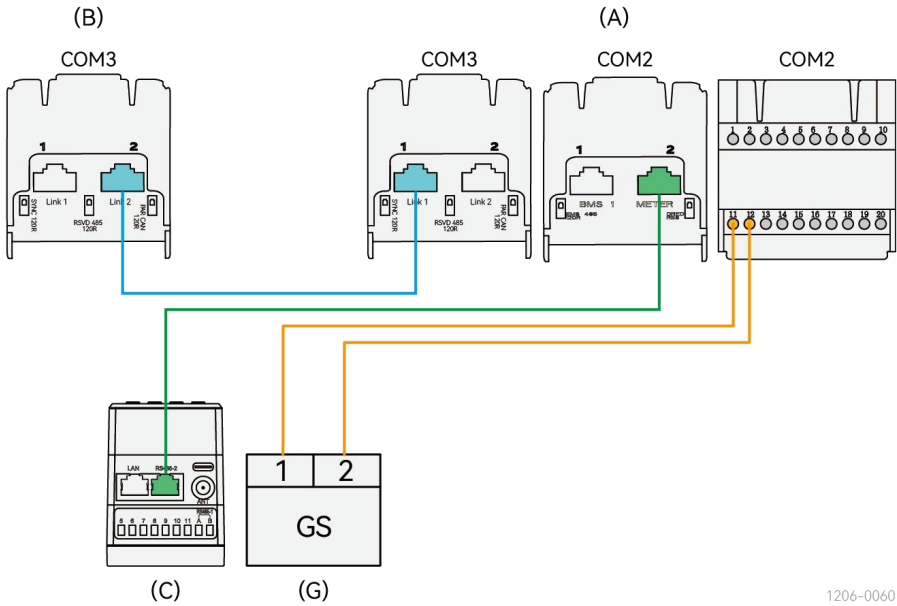
Generator start-stop control is supported via dry contact signals, either automatically or manually. To enable inverter-based generator control, the generator start-stop control signal must be connected to the COM2 port of the master unit.

Parallel and Generator System Diagram



1206-0059

Parallel and Generator Communication Diagram

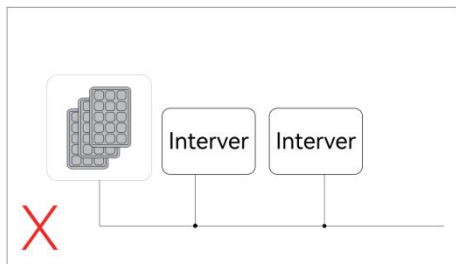


1206-0060

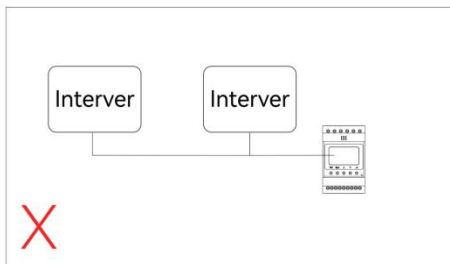
Item	Name
A	Master Inverter
B	Slave Inverter
C	Meter (with CT) or (CT)
D	Utility Grid
E	On-grid Loads
F	Back-up Loads
G	Generator

Item	Name
①	Parallel Communication Cable
②	Communication Cable between Meter and Inverter, or between CT and Inverter
③	ATS Status Feedback Signal
④	Generator Start-Stop Signal
GS	Generator Start Signal

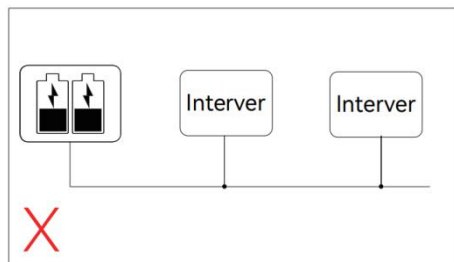
The following instances demonstrate wrong practices in parallel operation.



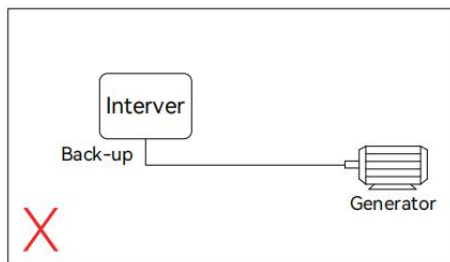
Single PV string cannot connect to multiple inverters.



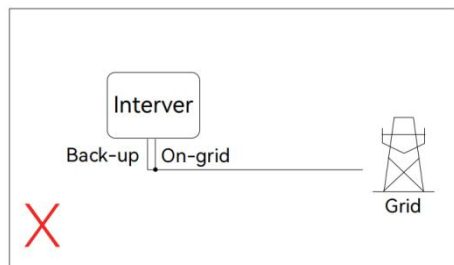
One meter cannot be connected to multiple inverters. Different CTs cannot connect to the same line cable.



One battery bank cannot be connected to multiple inverters.



The back-up side cannot be connected to the generator directly



The back-up side cannot be connected on grid side or grid.

7. Signal Connection

7.1. Communication Module

Inverter support connecting to the communication module via the COM1 port at the bottom.



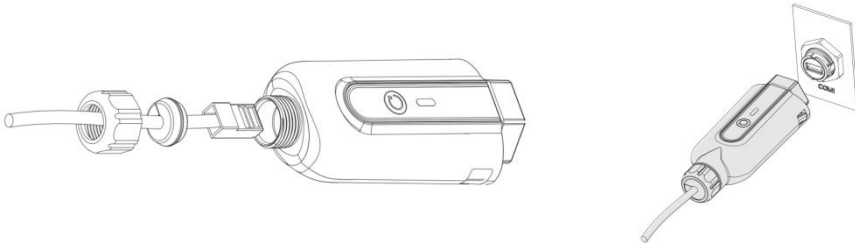
The communication module is shipped together with the inverter in the accessory box.

Connection Steps:

Step1: First connect the network cable to the communication module (if LAN communication is required).

Step2: Begin by rotating and removing the protective cover from the COM1 port.

Step3: Insert the communication module into the COM1 port until it is fully inserted. Rotate the nut until you hear an audible 'click', indicating that the connection is secure.



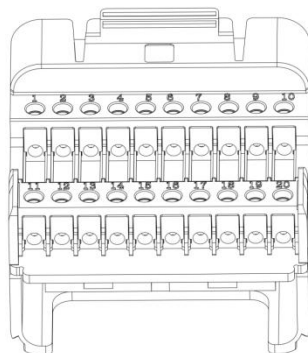
Please refer to the [Quick Installation Guide] for all related operating instructions of the communication module.

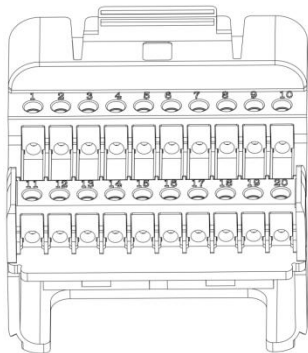
7.2. Multifunction Port

The inverter can communicate or establish control connections with external devices through the Multifunction Connectors COM2 and COM3.

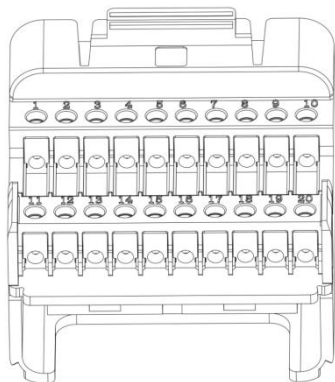
7.2.1. Port Definition

COM2 Definition

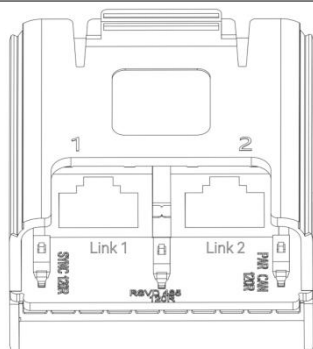
NO	Port		Function	
1	REF/0		Dry Contact Power Control Connect DRED/RCR/§14a devices DRED For Australia and New Zealand RCR for Germany, Austria and some other European countries	
2	COM/0			
3	D 1/5			
4	D 2/6			
5	D 3/7			
6	D 4/8			
7	DO3 NO		Reserved	
8	DO3 COM			
9	BK NC		/	
10	BK COM			
11	DO 1	NO	Diesel Generator Start/Stop Control Interface or Smart Load Start/Stop Control Interface (Custom Configuration)	
12		COM		
13	DO2	NO	Diesel Generator Start/Stop Control Interface or Smart Load Start/Stop Control Interface (Custom Configuration)	
14		COM		
15	Em.Stop	IN+	Emergency Stop Interface with Optional Normally Open (NO)/Normally Closed (NC) Contacts	
16		IN-		
17	DI 1	IN+	Digital input from ATS device	
18		IN-		
19	EMS 485	A	Communicate with the EMS device	
20		B		

NO	Port	Function	
1	BMS 1	Communicate with battery1 (RJ45)	
2	METER	Communicate with smart meter (RJ45)	
/	EMS 120R	Connect to EMS, requires enabling the terminating resistor	
/	DRED RES	Connect to DRED, requires enabling the terminating resistor	

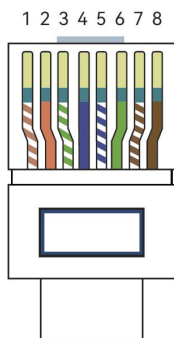
COM3 Definition

NO	Port		Function	
1	DI2 IN+		Reserved	
2	DI2 IN-			
3	RSVD 485A		Reserved	
4	RSVD 485B			
5	CPS12V+		12V output	
6	CPS12V-			
7	12V+		12V output	
8	12V-			
9	RSVD3		Reserved	
10	RSVD4			
11	CT-L1	S1	Connection of L1 Phase CT	
12		S2		
13	CT-L2	S1	Connection of L2 Phase CT	
14		S2		
15	CT-L3	S1	Connection of L3 Phase CT	
16		S2		
17	EV 485	A	Communication with EV charging pile (RS485)	
18		B		
19	BMS2	H	Communicate with battery 2	
20		L		

NO	Port	Function
1	Link1	Parallel Operation Communication Interface for Hybrid Inverters (RJ45)
2	Link2	
/	SYNC 120R	Termination resistors must be activated on the first and last inverters during parallel operation.
/	PAR CAN 120R	
/	RSVD 120R	Reserved



RJ45 Wiring Scheme Definition



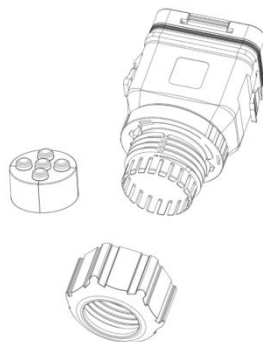
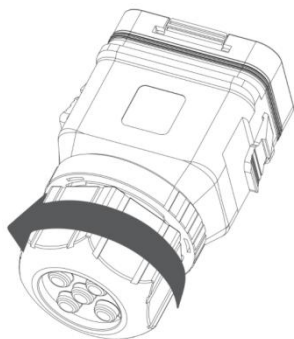
No	Color	BMS1	METER	Link1/2
1	Orange & White	/	/	Sync+
2	Orange	/	/	Sync-
3	Green & White	Encode_B*	485 B2	12V-
4	Blue	CANH_B1_OUT	/	CANH_P
5	Blue & White	CANL_B1_OUT	/	CANL_P
6	Green	Encode_A*	485 A2	12V-

*For Solinteg batteries only. The pin must remain open when other batteries are used with a Solinteg inverter.

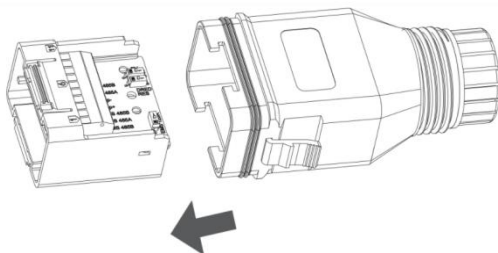
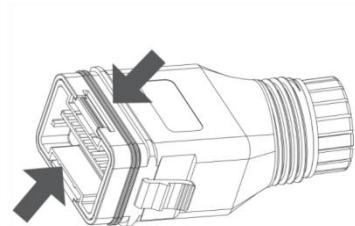
7.2.2. Wiring Procedure

Step1: Split Multi-Function Connector

1. Unscrew the swivel nut from the connector.
2. Remove the seal and lead the cable through the cable gland.

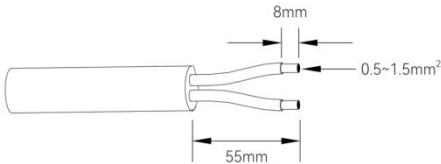


3. Take out the terminal block.

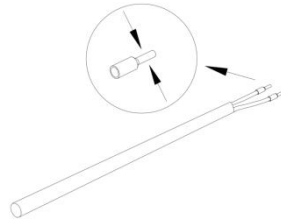


Step2: Terminal Block Wiring

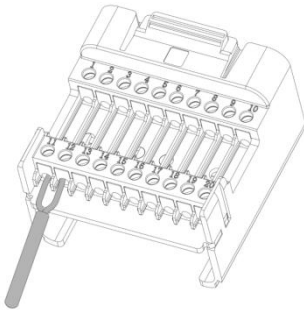
1. Thread the cable of appropriate length through the swivel nut and the housing. Remove the cable jacket and strip the wire insulation.



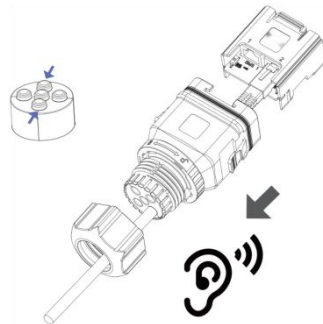
2. When using a multi-core multi-strand copper wire cable, twist the wires together by hand into a bundle and then press them into the terminal. In case of singlestrand copper wire, skip this step (Optional).



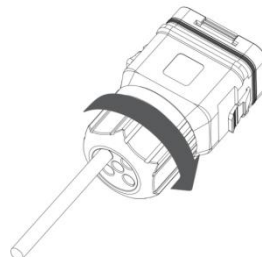
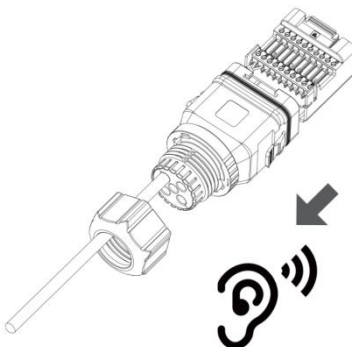
3. Fix all the wires to the terminal plug according to the assignment and tighten to a torque of $1.2 \pm 0.1 \text{ N} \cdot \text{m}$ with a screwdriver.



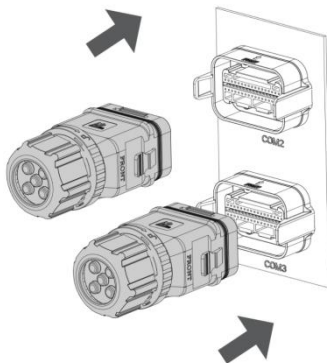
4. Thread the RJ45 plug of appropriate length through the swivel nut, and insert it into the open side of the rubber gasket. Insert one side of the RJ45 plug into the RJ45 port of terminal block.



5. Check if the cable is securely installed. Insert the terminal block into the connector until it snaps into place with an audible click. Finally, tighten the locking nut.



Step3: Insert the COM2 and COM3 connectors into the corresponding ports of the inverter.



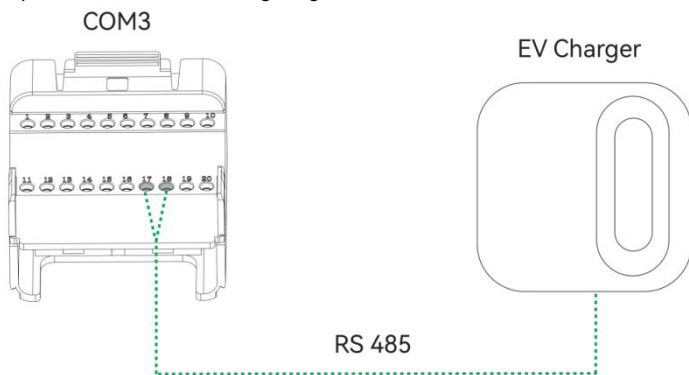
CAUTION

- ✧ Please distinguish between COM2 and COM3 terminals. COM3 terminal NOTICE is blue.
- ✧ Do not remove the waterproof plug from unused openings.

7.3. EV Charger Communication

The inverter communicates with the EV charger through the RS485 communication line.

The terminal block of the EV charging pile is located at COM3. Please refer to Section [7.2.1 Port Definition](#) for pin definitions. The wiring diagram is shown below.



CAUTION

The EV charger should be well grounded. Otherwise, it will affect the communication between the EV charger and the inverter.



NOTE

- ✧ The inverter is exclusively compatible with Solinteg ECA Series EV charging piles.
- ✧ For wiring configuration on the charging pile side, please refer to the EV charger manual.

7.4. Dry Contact Power Control

The inverter supports integration with DRED, RCR and §14a external power dispatch devices. All three functions can be configured by s via the monitoring platform or mobile application. The power control terminal block is located at COM2; refer to section [7.2.1 Port Definition](#) for pin definitions.



CAUTION

- ✧ DRED cannot be used simultaneously with RCR or §14a.
- ✧ RCR and §14a functions can be enabled concurrently.

The COM2 ports used by the three functions are as follows:

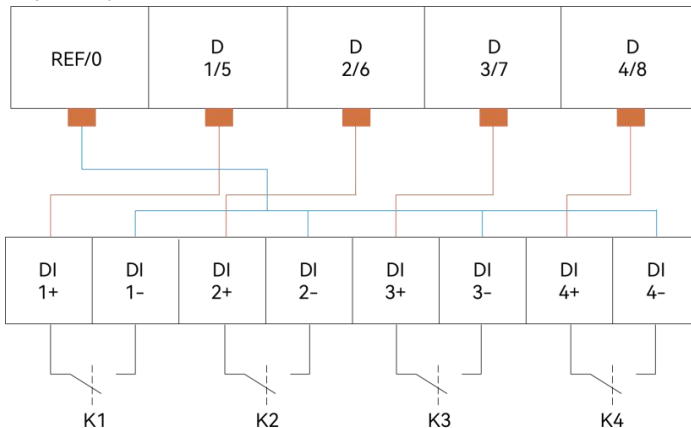
COM2 pin	DRED	RCR	§14a
1 REF /0	√	√	√
2 COM /0	√		√
3 D 1/5	√	√	
4 D 2/6	√	√	
5 D 3/7	√	√	
6 D 4/8	√	√	

RCR

RCR (Ripple Control Receiver) interface is special reserved for Germany and some other European countries according to their safety regulation, and Solinteg doesn't provide the RCR device for the customer.

In Germany and some European areas, a ripple control receiver is used to convert a power grid dispatching signal to a dry contact signal. The dry contact is required for receiving the power grid dispatching signal.

RCR wiring diagram (hybrid inverter) as below:



Users can set power values for switch modes K1, K2, K3 and K4 via the monitoring platform. Lower percentage settings have higher priority.

The RCR digital input (DI) control mode can be configured between:

Normally Open (NO) Mode: Function is triggered when the switch closes.

Normally Closed (NC) Mode: Function is triggered when the switch opens.

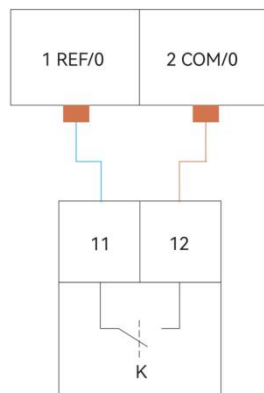
§14a

To meet the German Energy Industry Act (EnWG), the inverter supports grid dispatch strategy §14a.

When the grid sends signals to the inverter via the Gateway meter and Controller, if the battery's charging power from the grid exceeds 4.2 kW or the electric vehicle (EV) charger's power exceeds 4.2 kW, the system will automatically regulate the power of both devices separately to bring them within the 4.2 kW limit.

When the system contains multiple batteries or EV chargers, the system will automatically limit the charging power of each device to the minimum regulatory requirement (for detailed implementation specifications, please contact the Solinteg service team).

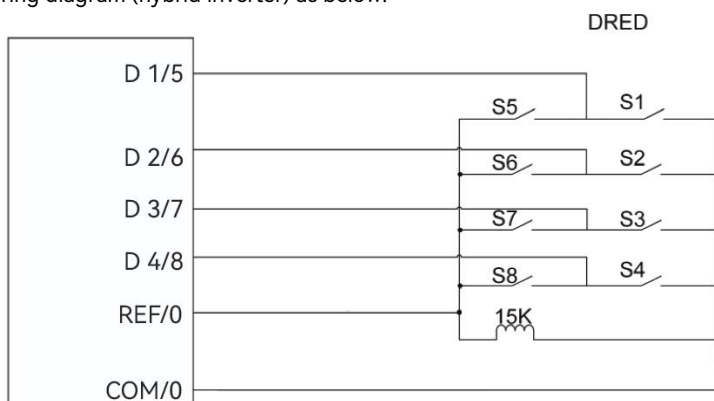
This function can be activated by the via the monitoring system. Refer to the wiring diagram right for installation details.



DRED

DRED (Demand Response Enabling Device) interface is special reserved for Australia and New Zealand according to their safety regulation, and Solinteg doesn't provide the DRED device for the customer. The inverter supports the demand response modes as specified in the standard AS/NZS 4777. The inverter has integrated a terminal block for connecting to a DRED.

DRED wiring diagram (hybrid inverter) as below:





NOTE

When using the function of DRED, please set the DRED detection resistor switch to "OFF".

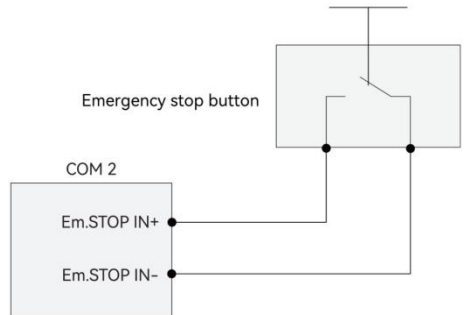
DRED mode as shown in table below:

Mode	Function
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).
Priority	DRM1 > DRM2 > DRM3 > DRM4 DRM5 > DRM6 > DRM7 > DRM8

7.5. Emergency Stop

The inverter is standard equipped with an emergency shutdown function. If this function is required at the installation site, it can be activated by connecting an external switch to the emergency shutdown interface, although the external switch is not included in the accessory box.

The emergency stop terminal is located at COM2. Pin definitions are detailed in section [7.2.1 Port Definition](#). Wiring diagram as shown on the right.



NOTE

Emergency stop buttons are available in normally open (NO) or normally closed (NC) types, with NC types recommended. Users must set the logic parameters of the inverter's emergency stop port according to the selected button type.

7.6. Smart Load

The inverter integrates a smart load management function, which helps customers utilize green power more efficiently. It can work collaboratively with Smart Grid-ready heat pumps (SG ready HP) and control load engagement/disengagement from the system. Control options include manual mode, smart mode, etc. (for details, contact the Solinteg service team).

The wiring terminals for this function are located at COM2; see [7.2.1 Port Definition](#) for pin definitions.

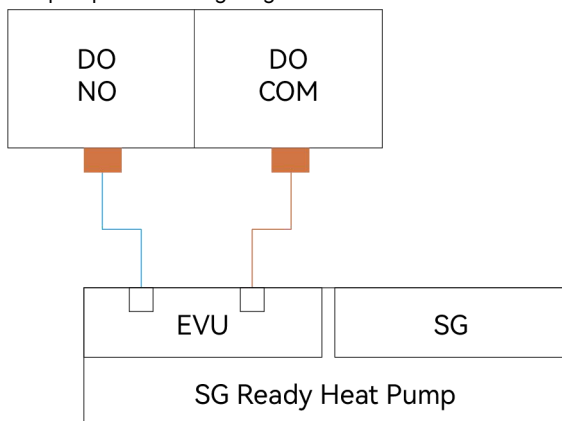


CAUTION

Maximum voltage and current for the DO dry contact port: 30VDC 1A.

7.6.1. Heat Pumps

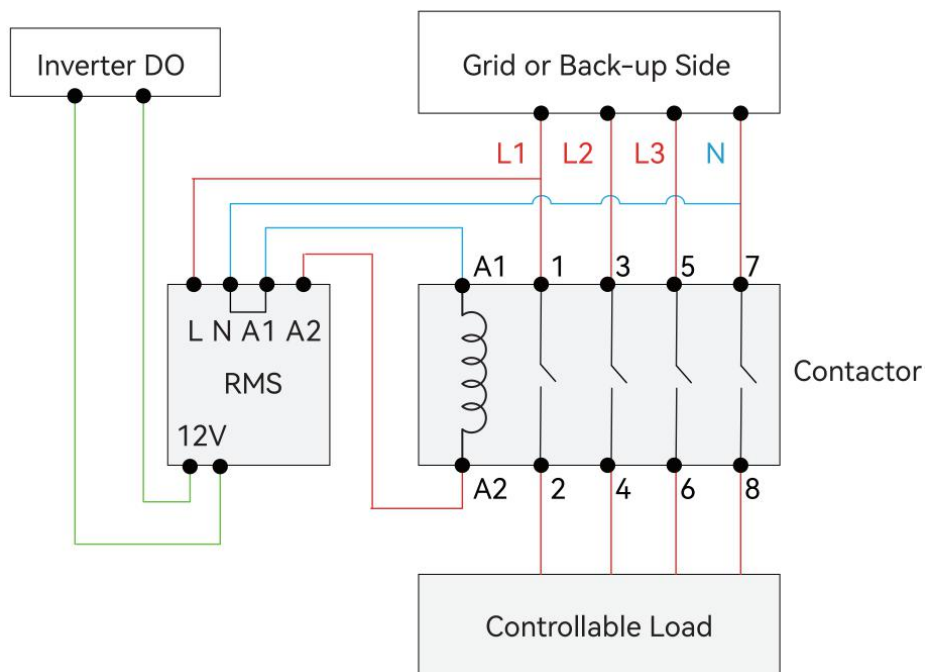
The inverter supports switching between the most commonly used operation modes 2 and 3 of Smart Grid-ready heat pumps. The wiring diagram is shown below:



1206-0064

7.6.2. Load Control

The inverter can achieve load engagement/disengagement from the system by controlling the on/off state of the external contractor. The wiring diagram is shown below.



The RMS converter and contactor are not included in the accessory kit and must be purchased separately.

8. Commissioning



WARNING

When the grid status indicator light is constantly on (inverter in grid-connected status), it is prohibited to close the DC switch again. Failure to conduct insulation impedance detection beforehand may cause inverter damage. If switch closure is required, first shut down the inverter, then close the switch, and restart the inverter. Losses caused thereby will not be covered under warranty.

8.1. App Preparation

Step1: Install the Cloud monitoring App with latest version.

After installing the monitoring module and completing network configuration, the monitoring platform and APP can perform real-time monitoring of the inverter's operational status and data.

For download-related issues, please contact your distributor or Solinteg service team.

Solinteg monitoring platform web address:

www.solinteg-cloud.com

Step2: Register an account on the Cloud monitoring App. If you have got the account and password from the distributor/installer or Solinteg, skip this step.



NOTE

To enhance after-sales service efficiency, we recommend installing the monitoring module and completing network configuration.

8.2. Pre-Commissioning Inspection

Before energizing the inverter, confirm the following:

- ✧ Installation integrity: All equipment has been securely mounted.
- ✧ Switchgear position: DC switch and AC circuit breaker are in "OFF" position.
- ✧ Grounding compliance: Grounding cables are correctly and securely connected.
- ✧ Cable routing: AC cables, DC cables and communication cables are correctly and securely connected.
- ✧ Termination protection: Unused terminals are sealed with protective caps.
- ✧ Foreign object removal: No leftover tools or foreign objects inside equipment housing or junction boxes.
- ✧ Breaker specification: AC circuit breaker rating complies with this manual and local standards.
- ✧ Safety markings: All warning labels and safety markings are intact and legible.

8.3. Commissioning Procedure

After completing pre-commissioning checks, proceed with the following steps for initial inverter energization:

- ✧ DC power application: Rotate the DC switch to "ON" position. The DC disconnect may be integrated within the inverter or customer-installed. Wait for 5 minutes to complete power-on sequencing.
- ✧ Battery activation: If battery equipped, manually activate the battery pack power switch.
- ✧ AC circuit energization: Close the AC-side circuit breaker.
- ✧ Grid synchronization: Inverter will operate normally when irradiance and grid conditions meet requirements. Connection time to grid may take several minutes to tens of minutes depending on selected national safety codes and actual grid status.
- ✧ Status verification: Monitor LED status indicators to confirm normal operation.
- ✧ Network configuration: Follow the instructions in the app to configure the network settings and other information for the inverter.



CAUTION

After initial installation, it is recommended to enable the SOC RESET function. The battery will automatically charge to calibrate the SOC, and this function will automatically turn off once the battery is fully charged (if sufficient energy is unavailable to fully charge the battery, the function can be manually disabled). We recommend manually enabling this function periodically in subsequent operations.



NOTE

- ✧ If the inverter fails to operate properly, check the safety code and battery ID settings.
- ✧ Select the appropriate safety code according to the country/region where the inverter is installed.
- ✧ Select the corresponding battery ID based on the installed battery.
- ✧ The inverter has a function to automatically detect CT installation direction and phase sequence. This function can be accessed via the APP after system installation.
- ✧ During system energization or operation, ensure no obstacles (e.g., cables or personnel holding the handle) block the handle rotation path of the DC circuit breaker.
- ✧ If the inverter remains installed but non-operational for six months or longer, it must undergo professional inspection and testing before resuming operation.

8.4. Shut Down The Inverter

When shutting down the inverter, follow these steps:

- ✧ Turn off the inverter via the APP or button.
- ✧ Disconnect the grid-side and load-side circuit breakers.
- ✧ Turn off the battery switch, and disconnect the DC breaker on the battery side (if applicable).
- ✧ Wait 30 seconds and then turn the inverter DC switch to the "OFF" position. At this time, there is remaining power in the inverter capacitor. Wait for 10 minutes until the inverter is completely de-energized before operating.
- ✧ If the inverter requires restarting, follow the Commissioning Procedure.
- ✧ If the inverter is not used for some time or never again, please disconnect the AC and DC cables. Please notice disconnection cables is only for disconnection and requires an electrician/trained approved personnel.

9. Operation

9.1. Display and Buttons

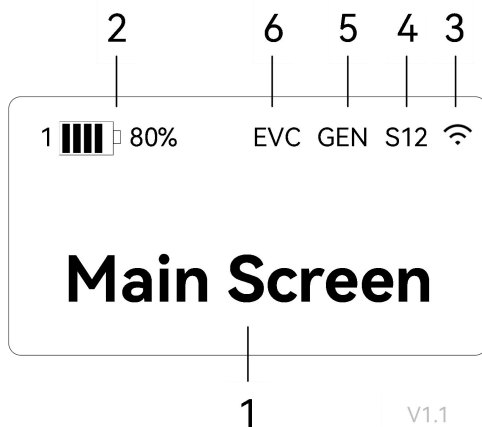


9.1.1. Indicator

Indicator		Status		Description
	Power and Alarm Indicator	Off		No power.
		Blue	Quick flashing	Inverter entered self-test status.
			Slow flashing	Inverter entered waiting status.
			Breathe flashing	Inverter works normal.
		Orange	Breathe flashing	Low battery warning, the battery power is about to reach the SOC protection value.
			Always on	Please upgrade to the latest firmware.
		Red	Always on	An alarm or fault is detected, view the fault info on the display

Indicator		Status		Description
	Grid Indicator	Off		Grid lost.
		Slow flashing		Inverter detected grid but not running in on-grid mode.
		Always on		Inverter works in on-grid mode.
	Communication Indicator	Green	Always on	The inverter communication is running normally
			Flashing	The inverter is communicating with the EMS via RS-485 or is communicating with the master inverter via the CAN bus.
		Orange	Always on	The inverter isn't communicating with Solinteg smart meter.
		Red	Always on	The inverter isn't communicating with the BMS.

9.1.2. Display



Item	Description
1	Display the inverter's basic information, operating status, parameter settings, etc.
2	Display the battery SOC (State of Charge).
3	Inverter Communication Methods
4	Status code of inverter. Please refer to Section 10.1 Status Code .
5	Display the generator is operating
6	Display the inverter is connected to the EV charger

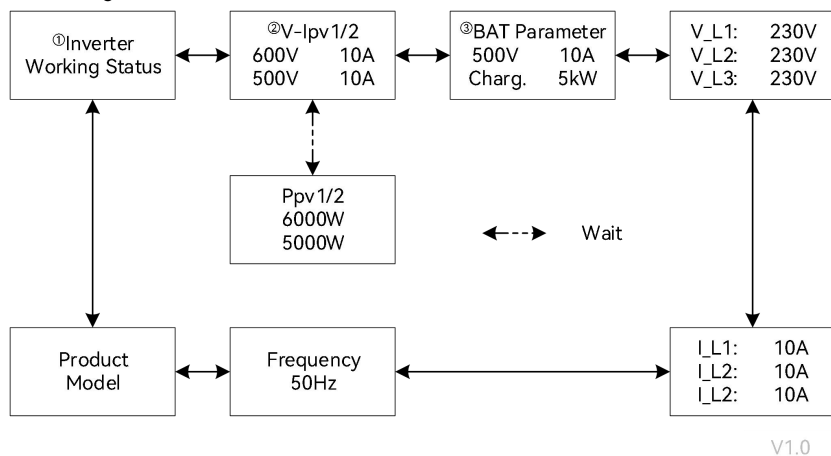
9.1.3. Button

Symbol	Button	Description
	ESC	Exit the current interface/return/cancel edit. Long press for 3 seconds to restart the screen.
	Up	Move the cursor up or adjust the value.
	Down	Move the cursor down or adjust the value.
	OK	Enter the next level menu/confirm selection/enter edit mode.

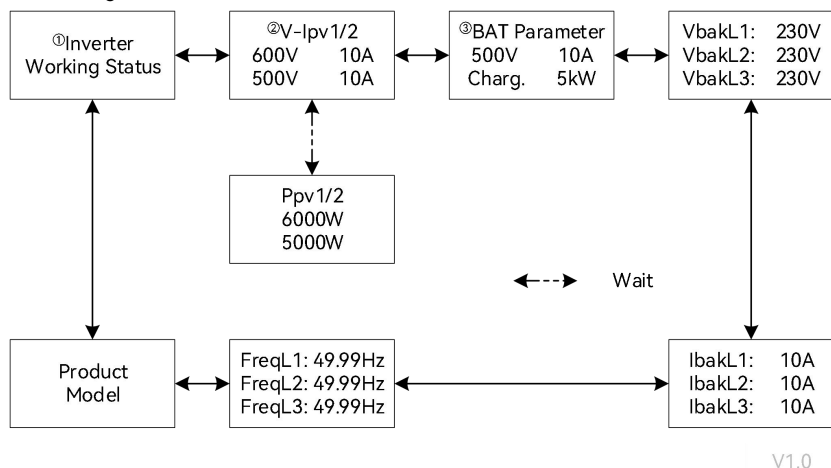
9.2. Screen Menu

9.2.1. Main Screen

Inverter in On-grid status:



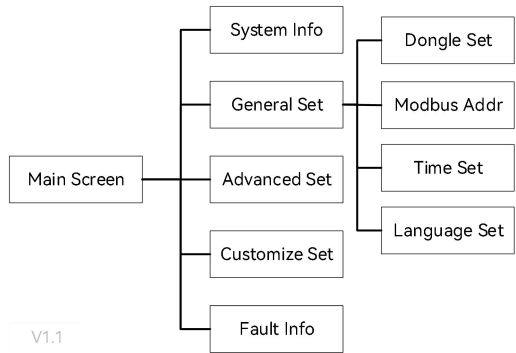
Inverter in Off-grid status:



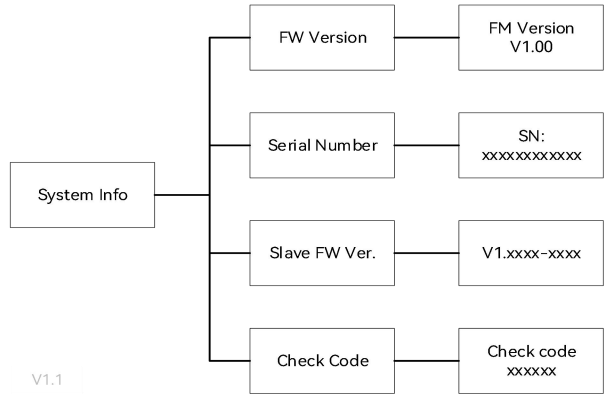
- ①Inverter Operating Status: Waiting/Checking/On-Grid/Off-Grid/Fault Info/FW Updating.
- ②PV Parameters are sequentially displayed according to the actual number of MPPTs.
- ③Battery Parameters are sequentially displayed according to the actual number of independent battery inputs.

Item	Description
V _{lp1/2}	PV input voltage and current of each MPPT
P _{pv1/2}	PV input power of each MPPT
BAT Parameter	Battery Parameter
Charg.	Battery charge
Dischg.	Battery discharge
V _{L1} : / V _{L2} : / V _{L3} :	Three-phase AC voltage (On-Grid status)
V _{bakL1} : / V _{bakL2} : / V _{bakL3} :	Three-phase AC voltage (Off-Grid status)
I _{L1} : / I _{L2} : / I _{L3} :	Inverter output current (On-Grid status)
I _{bakL1} : / I _{bakL2} : / I _{bakL3} :	Inverter output current (Off-Grid status)
Frequency:	Inverter output Frequency(On-Grid status)
FreqL1: / FreqL2: / FreqL3:	Inverter output Frequency (Off-Grid status)
Fault Info	Fault Information
FW Updating	Firmware Updating

9.2.2. Main Menu

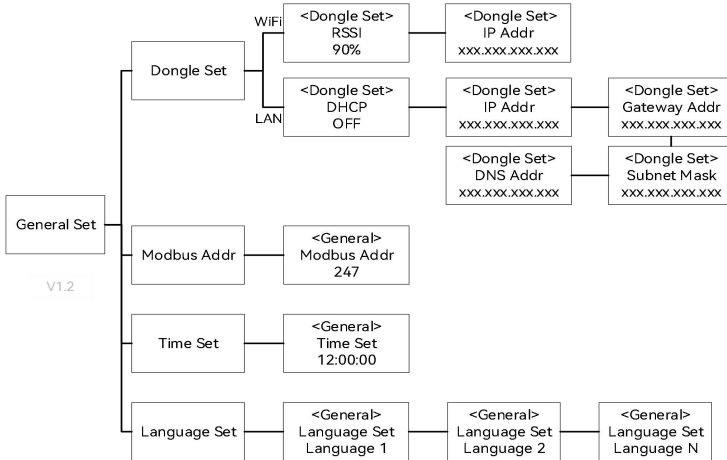


9.2.3. System Information



Item	Description
FW Version	Check Inverter Firmware Version
Serial Number	Check Inverter Serial Number
Slave FW Ver.	Check Inverter Slave Firmware Version
Check code	Check Inverter Check Code

9.2.4. General Settings



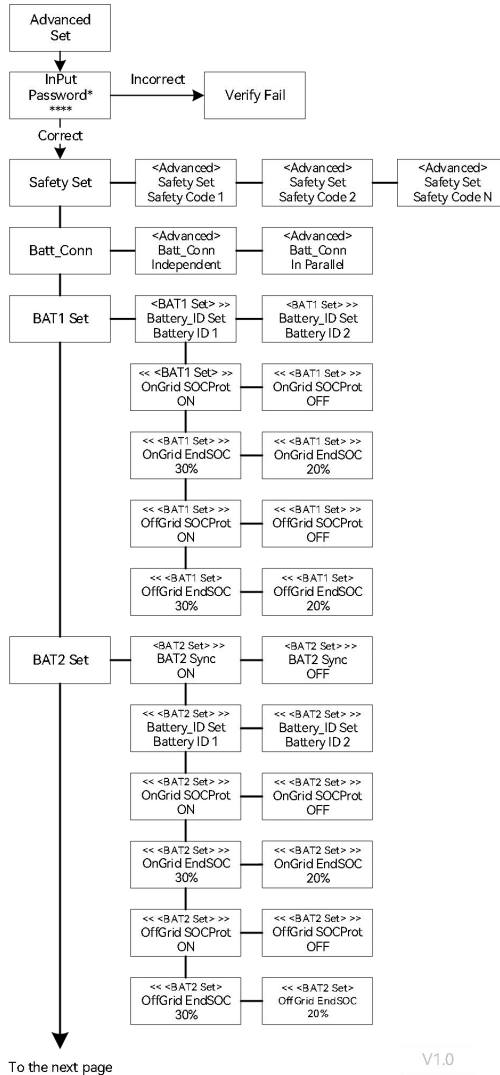
Item	Description
RSSI	Check Wi-Fi Signal Strength (Not Available during LAN Communication)
IP Addr	View or Configure IP Address (DHCP is disabled) during LAN Communication
Modbus Addr	View or Configure Inverter Modbus Address
Time Set	View or Configure Inverter RTC Time
Language Set	View or Configure Inverter Screen Display Language



NOTE

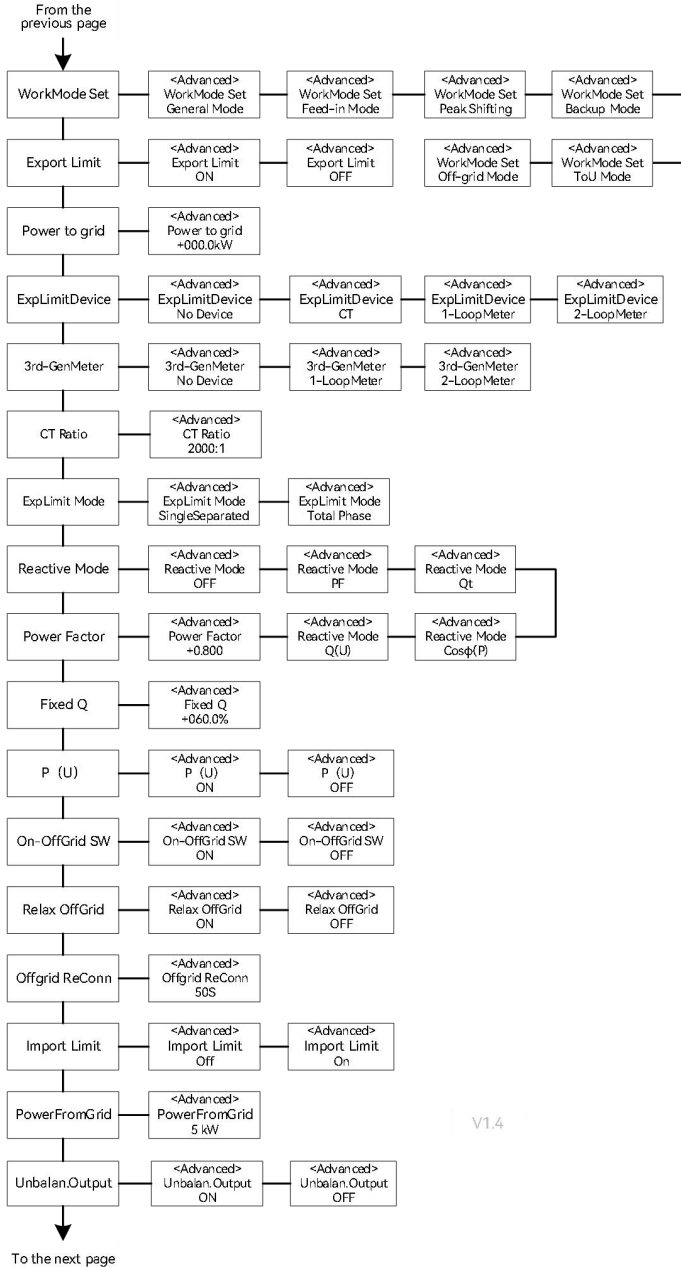
After configuration, select "Yes" to save changes or select "No" to cancel the operation (changes will not be saved).

9.2.5. Advanced Settings

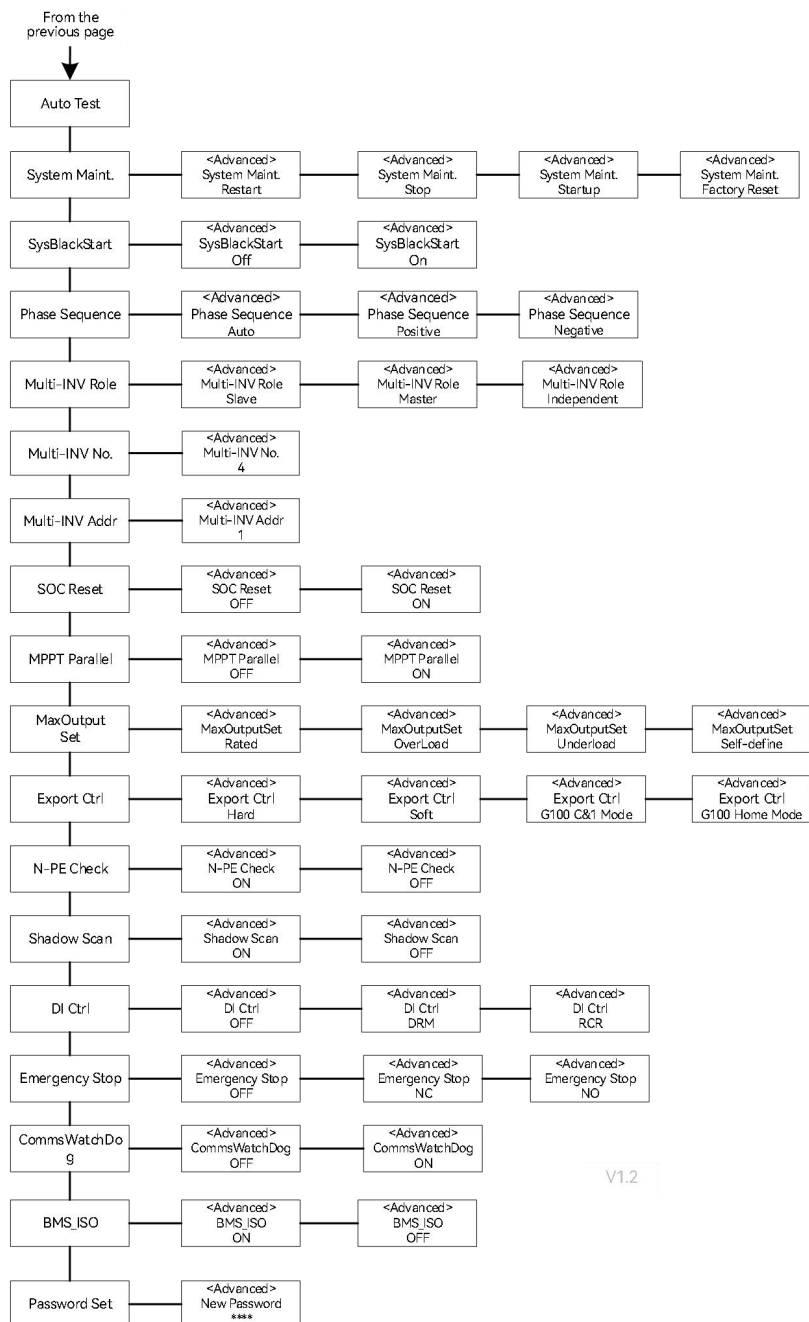


V1.0

*Please contact Solinteg service team for password.



V1.4



Item	Description
Safety Set	Please select the safety code according to local regulatory requirements, or contact the installer or Solinteg service team
Batt_Conn	Battery Connection Methods Independent: Two battery ports are connected independently In Parallel: Two battery ports are connected in parallel
BAT1 Set	Battery 1 Parameter Settings
BAT2 Set	Battery 2 Parameter Settings
Battery_ID Set	Select the battery model. Select the correct battery ID. Otherwise, communication between the inverter and the battery will be abnormal.
BAT2 Sync	Battery 2 synchronizes with Battery 1's settings
OnGrid SOCPort	On-grid battery SOC protection.
OnGrid EndSOC	End-of-discharge SOC of on-grid.
OffGrid SOCProt	Off-grid SOC protection.
OffGrid EndSOC	End-of-discharge SOC of off-grid.
Work Mode	Operation mode selection
Export Limit	On-grid export limit function switch.
Power to grid	Set the allowable grid feed-in power
ExpLimitDevice	Select Meter/CT/No Device for export limit
CT Ratio	The ratio of primary rated current to secondary rated current
ExpLimit Mode	Choose the mode according to grid operator requirements. SingleSeparated: Controls inverter output independently for each phase to prevent power feed in to the grid. Total Phase: Controls inverter output based on the total three-phase power to prevent power feed in to the grid. In this mode, one or two phases may still feed in to the grid.
Reactive Mode	Reactive Power Mode Selection. Specific reactive power mode parameters can be configured via the monitoring platform or mobile app.
Power Factor	In PF mode of reactive mode, the inverter inputs reactive power according to the set power factor.
Fixed Q	In Qt mode of reactive mode, the inverter outputs a fixed value of reactive power.
P(U)	P(U) curve switch. The inverter outputs active power based on the changes in the grid voltage.

Item	Description
On-Off Grid SW	Off-grid function switch (If turn it on, the inverter will automatically switch to off-grid mode to ensure the back-up side power supply when the grid is abnormal or off, otherwise, there is no output on the back-up side). Turn on this switch, and HVRT (High Voltage Ride Through) and LVRT (Low Voltage Ride Through) functions will be disabled.
Relax OffGrid	Reduce the switching sensitivity of the On/Off-grid (applied to the places where the grid is unstable or inverter always entered off-grid mode for some reasons).
Offgrid ReConn	When operating off-grid, after overload protection, the inverter will stop the output on the back-up side and then restart within the set time period.
Import Limit	The switch for setting the power allowed to be drawn from the grid.
PowerFromGrid	Set the power allowed to be drawn from the grid.
Unbalan.Output	3-Phase unbalanced output switch.
Auto Test	CEI 0-21 auto test.
System Maint.	System Maintenance Settings Restart: Turn off and restart the inverter. Stop: Turn off the inverter, retain bypass functionality (if enabled). Startup: Power on the inverter.
Phase Sequence	Phase Sequence Settings Auto: Grid phase sequence auto-adaptive Positive: Grid phase sequence is positive Negative: Grid phase sequence is negative
SysBlackStart	Inverter Black Start Function Enable/Disable
Multi-INV Role	In a master-slave parallel system, the inverter settings are as follows: Master: The master inverter in the system. Slave: The slave inverter in the system. Independent: Operates as an independent inverter.
Multi-INV No.	This menu is displayed only when the inverter is Master. Set the number of master-slave parallel. Range: 2~10.
Multi-INV Addr	This menu is displayed only when the inverter is Slave. Set the address of slave inverter. Range: 1~9.
SOC Reset	SOC reset function. If turned it on, the battery will be automatically charged to calibrate the battery SOC. After the battery is charged, this function will be turned off automatically
MPPT Parallel	MPPT parallel function switch.
MaxOutputSet	Select the maximum AC output power.

Item	Description
	Rated: Max.output power= Rated output power. Overload: Max. output power= 1.1 times Rated output power. Underload: Max. output power < Rated output power. Self-define: Set the AC power limit according to the actual application.
Export Ctrl	In the power export limit on mode, when the communication between the inverter and meter or the inverter and datalogger is interrupted, select the inverter operation mode from one of the follows, Hard, inverter stops AC output. Soft, inverter generates power as the "Feed in Grid" value set on the screen.
N-PE Check	Check backup ground to chassis ground connection in the off-grid status. Disable function if backup side is unused.
Shadow Scan	MPPT Shadow Scan Function Switch.
DI Ctrl	Power Control Signal Type.
Emergency Stop	Emergency Stop (E-Stop) Function Type.
CommsWatchDog	In a master-slave parallel system, when the communication between the slave and master is interrupted, the slave will cease AC output.
BMS_ISO	Battery insulation detection switch.
Password Set	Password setup.



NOTE

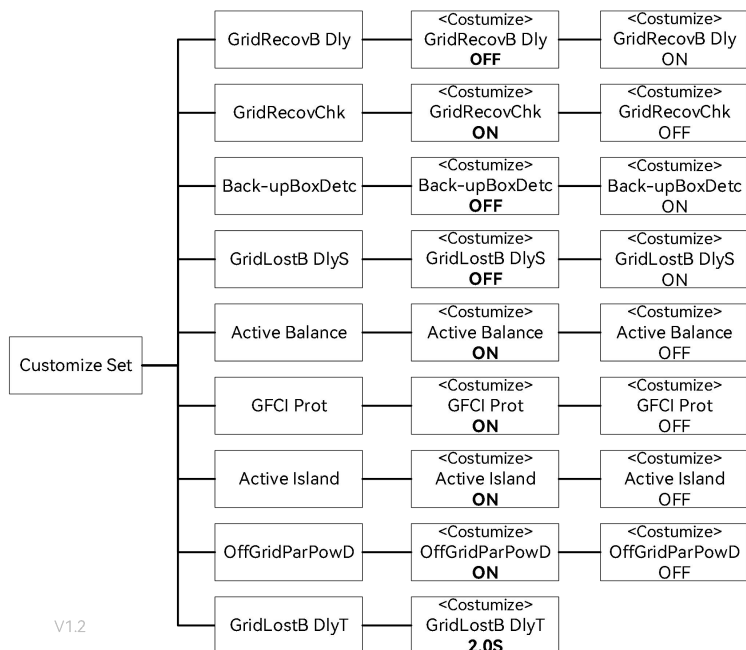
Operation Mode: Please refer to Section [3.5. Operation Modes](#).

Reactive Mode: Please refer to Section [9.3. Reactive Power](#).

DI Ctrl: Please refer to Section [7.4. Dry Contact Power Control](#).

Emergency Stop: Please refer to Section [7.5. Emergency Stop](#).

9.2.6. Customize Settings



Item	Full name	Description and Application scenarios
GridRecovB Dly	Grid recover back-up output delay function	When customers connect non-self-resetting ATS devices to both Grid and Backup sides, please enable this function. The Backup side output will be delayed by 500ms, allowing the ATS to transition from Backup side to Grid side.
GridRecovChk	Grid recover self-check function	In areas with unstable grid conditions, this function can be disabled to prevent potential grid power loss during self-test procedures, which could lead to Backup side output interruption. Note: Disabling the self-test function may not comply with local grid interconnection regulations.
Back-upBoxDetc	Back-up box detection function	Once enabled, the inverter will monitor the backup box for proper operational status. Note: This function is activated automatically in off-grid parallel mode. In standalone installations equipped with a backup box, please manually enable this function.
GridLostB DlyS	Grid lost back-up output delay function	When the system is connected to inrush loads, the inverter may fail to transition from on-grid mode to off-grid mode and operate properly. Enabling this

Item	Full name	Description and Application scenarios
		function will delay the Backup output, thereby increasing the likelihood of successful system restart.
Active Balance	Grid active balancing function	When this function is enabled, in the absence of PV and battery systems, the inverter will automatically activate the Three-phase Imbalance Function to balance the power at the grid port.
GFCI Prot	GFCI protection function	When abnormal leakage current in the system causes the inverter to fail in normal operation, this function may be disabled under the condition of confirmed safety. Note: Prior to disabling this function, confirm the absence of safety hazards and ensure the system is equipped with alternative leakage current protection devices.
Active Island	Active islanding disturbance function	In certain test scenarios, this function needs to be disabled. No action is required during normal operation. Note: Disabling the active islanding disturbance function does not affect the availability of the passive islanding protection function.
OffGridParPowD	Off-grid parallel power distribution function	Backup-side parallel connection It must be enabled for off-grid parallel operation. After activation, the master unit will manage power scheduling and allocate power commands to the slave inverters.
GridLostB DlyT	Grid lost back-up output delay time	When the system is connected to impact loads, the inverter's grid-connected to off-grid transition may fail. To address this, enable the Grid lost back-up output delay function (GridLostB DlyS) and configure the delay time to allow Backup output delay, which enhances the probability of successful system reinitialization. Time setting range: [1, 600] seconds

9.2.7. Auto Test

This function is disabled by default, and will be only functional in the safety code of Italy.

Auto Test can be enabled through the inverter's screen menu.

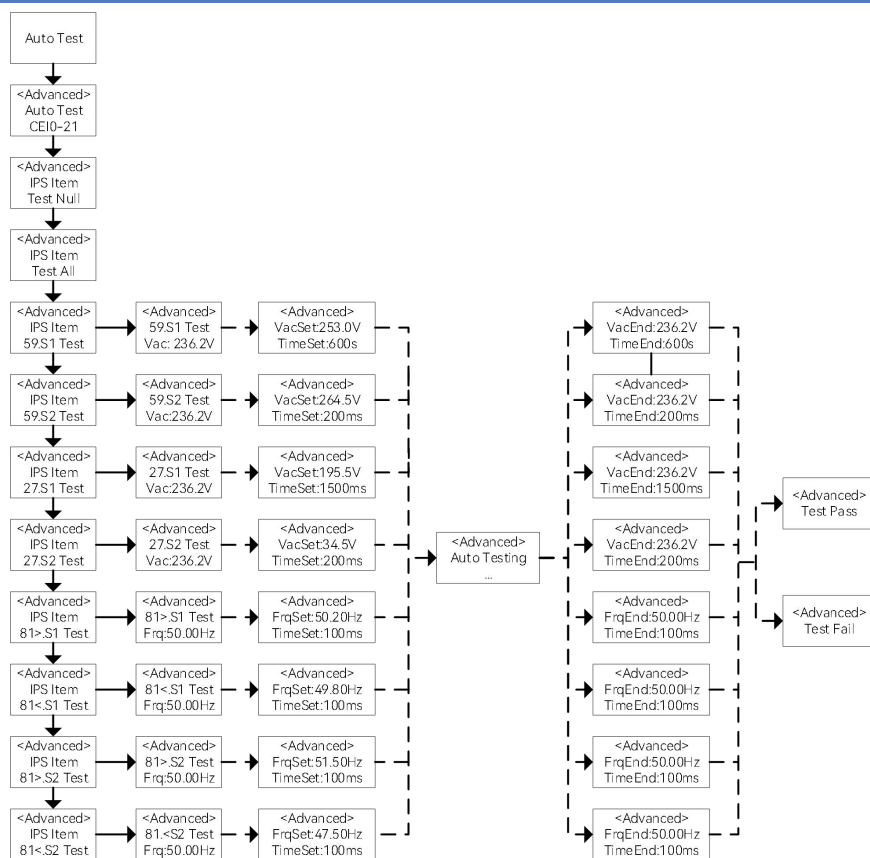
The Auto Test will start when the correct test item is selected, and the test result will be displayed on the screen when it is finished. Note that "Test Null" does not perform any checks, whereas "Test All" runs all test items.

After each item tested, the inverter will reconnect to the grid and automatically start the next test according to the requirements of CEI 0-21.



NOTE

The specific display parameters should be considered as reference to the actual situation.



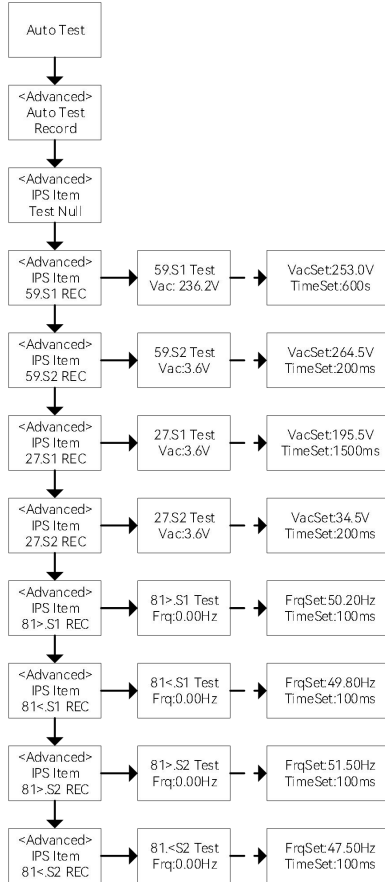
→ Wait

View Test Records for Auto Test:



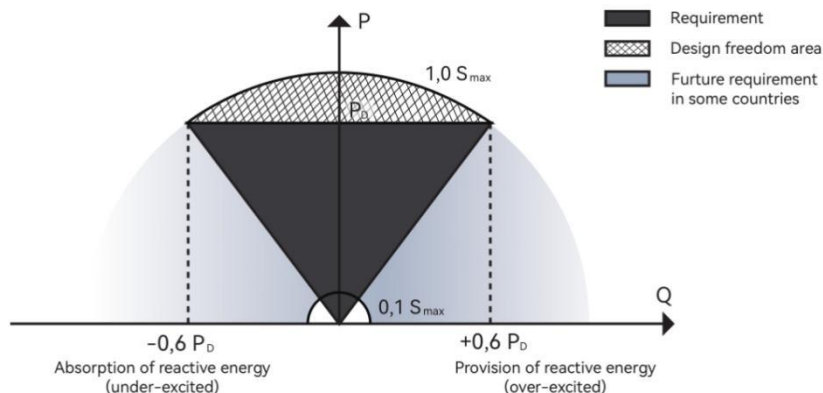
NOTE

Select the relevant test items, and after waiting for a period, the test records will be displayed.



9.3. Reactive Power

The inverter provides a reactive power regulation function.



This mode can be enabled via configuration software. It is enabled by default in some regions, such as AU, DE market. For information on how to change default setpoints please contact Solinteg service team.

Descriptions of reactive power regulation mode:

Mode	Descriptions
Off	The PF is fixed at +1.000.
PF	The reactive power can be regulated by the parameter PF (Power Factor).
Qt	The reactive power can be regulated by the parameter fixed Q (in Pn%).
$\cos\phi(P)$	The PF changes with the output power of the inverter.
Q(U)	The reactive power changes with the grid voltage.

9.3.1. "Off" Mode

The reactive power regulation function is disabled. The PF is limited to +1.000.

9.3.2. "PF" Mode

The power factor is fixed and reactive power setpoint is calculated according to the current power.

The PF ranges from 0.8 leading to 0.8 lagging.

Leading: the inverter is sourcing reactive power to the grid.

Lagging: the inverter is injecting reactive power into the grid.

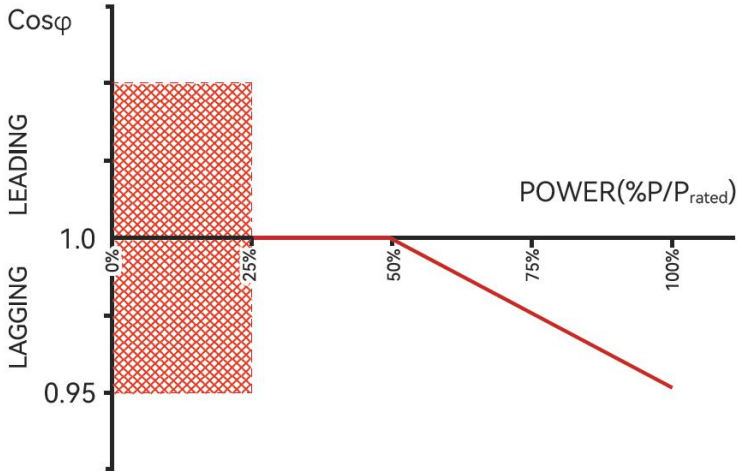
9.3.3. "Qt" Mode

In the Qt mode, system reactive power is fixed, and the system injects reactive power based on the proportion set by Fixed Q (in Pn%).

The setting range of the reactive power ratio is -60%~60%, corresponding to the ranges of inductive and capacitive reactive power regulation respectively.

9.3.4. "Cosφ(P)" Mode

The PF of the inverter output varies in response to the output power of the inverter.

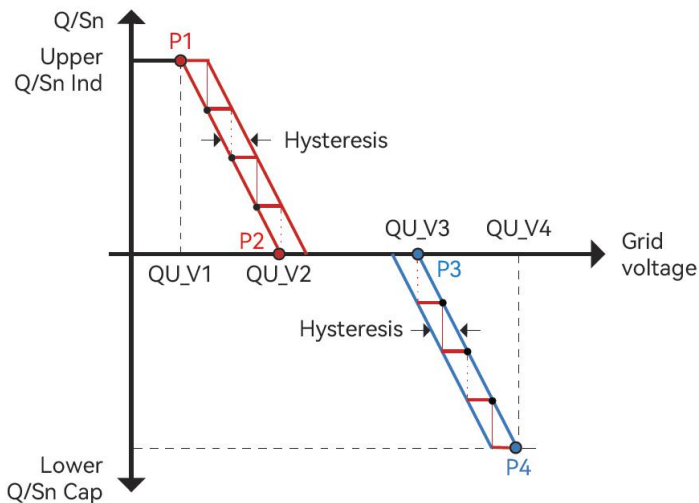


"Cosφ(P)" mode parameter descriptions:

Parameter	Descriptions	Range
Cosφ(P)_P1(Point A)	Output power at P1 on the Cosφ(P) mode curve (in percentage)	10%~100%
Cosφ(P)_P2(Point B)	Output power at P2 on the Cosφ(P) mode curve (in percentage)	20%~100%
Cosφ(P)_P3(Point C)	Output power at P3 on the Cosφ(P) mode curve (in percentage)	20%~100%
Cosφ(P)_K1(Point A)	Power factor at P1 on the Cosφ(P) mode curve	0.8~1
Cosφ(P)_K2(Point B)	Power factor at P2 on the Cosφ(P) mode curve	
Cosφ(P)_K3(Point C)	Power factor at P3 on the Cosφ(P) mode curve	
Cosφ(P)_Enter-Voltage	Voltage percentage for Cos φ (P) function activation, or Grid Voltage Percentage for Entering Cosφ(P) Curve	100%~110%
Cosφ(P)_Exit-Voltage	Voltage percentage for Cos φ (P) function deactivation, or Grid Voltage Percentage for Exiting Cosφ(P) Curve	90%~100%

9.3.5. "Q(U)" Mode

The reactive power output of the inverter will vary in response to the grid voltage.

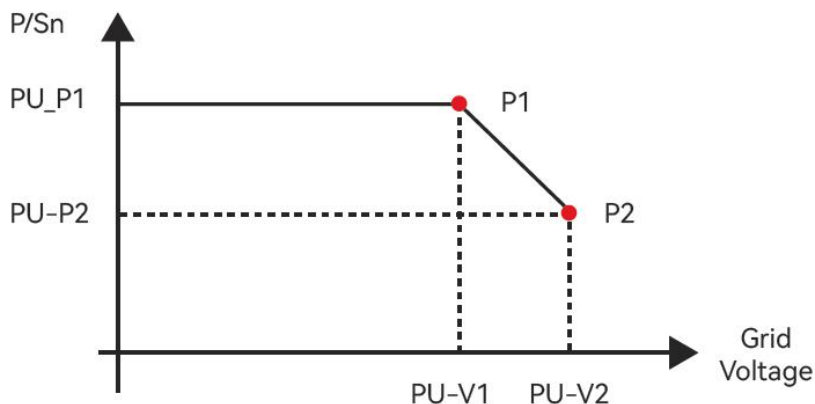


"Q(U)" mode parameter descriptions:

Parameter	Descriptions	Range
QU_V1	Grid voltage limit at P1 on the Q(U) mode curve	80%~100%
QU_Q1	Value of Q/Sn at P1 on the Q (U) mode curve	0~60%
QU_V2	Grid voltage limit at P2 on the Q(U) mode curve	80%~100%
QU_Q2	Value of Q/Sn at P2 on the Q (U) mode curve	-60%~60%
QU_V3	Grid voltage limit at P3 on the Q(U) mode curve	100%~120%
QU_Q3	Value of Q/Sn at P3 on the Q (U) mode curve	-60%~60%
QU_V4	Grid voltage limit at P4 on the Q(U) mode curve	100%~120%
QU_Q4	Value of Q/Sn at P4 on the Q(U) mode curve	0~-60%
QU_Enter-Power	Active power for Q(U) function activation Or, Active Power Percentage for Entering Q(U) Curve	20%~100%
QU_Exit-Power	Active power for Q(U) function deactivation Or, Active Power Percentage for Exiting Q(U) Curve	1%~20%

9.4. Active Power

The active power output of the inverter varies in response to the grid voltage.



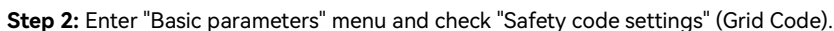
It is enabled by default in some regions, such as AU, EU market. "P(U)" Mode is named "[b] Volt-watt mode" in AS/NZS 4777.2 Chapter 3.3 "Power quality response mode".

"P(U)" mode parameter descriptions:

Parameter	Descriptions	Range
PU_V1	Grid voltage limit at P1 on the P(U) mode curve	100%~120%
PU_P1	Value of P/Sn at P1 on the P (U) mode curve	0~100%
PU_V2	Grid voltage limit at P2 on the P(U) mode curve	100%~120%
PU_P2	Value of P/Sn at P2 on the P (U) mode curve	0~100%
PU(τ)	Time constant of the P(U) mode curve	0~60s

The inverter can check and adjust grid code, reactive and active modes setpoints via monitoring platform.

Step 1: On the monitoring interface, click "Device list" in the "Devices". Click "Configure" in "Operate" in the column of the device set.



Step 3: Enter "Protection Parameters" and "Grid Connection Parameter" menu under "Grid Connection Parameter" and check grid protection settings setpoints.

The image displays two screenshots of the SOLINTEG mobile application interface, specifically the 'Parameter settings' screen for a device. The left sidebar shows navigation options: Plants, Upgrade list, Firmware upgrade, Replace record, Devices, Alarm, Reports, and Manage. The main content area is titled 'Parameter settings' and includes fields for SN, Device name, and Plant name. A search bar is also present.

Top Screenshot: Protection parameters

The 'Protection parameters' sub-menu is selected. It shows the following settings:

- 10-min overvoltage protection switch: ☐ Off ☒ On
- OV/UV settings**
 - Level-1 UV protection threshold: 184 V
 - Level-1 UV protection time: 1600 ms
 - Level-1 OV protection threshold: 276 V
 - Level-1 OV protection time: 1600 ms
 - Level-2 UV protection threshold: 115 V
 - Level-2 UV protection time: 120 ms
 - Level-2 OV protection threshold: 310.5 V
 - Level-2 OV protection time: 120 ms
- OF/UF settings**
 - Level-1 UF protection threshold: 48 Hz
 - Level-1 UF protection time: 1000 ms
 - Level-1 OF protection threshold: 52 Hz

Bottom Screenshot: Grid connection parameter

The 'Grid connection parameter' sub-menu is selected. It shows the following settings:

- Grid connection switch: ☐ Off ☒ On
- Active power increase gradient: 100 %Pn/min
- Starting to generate power**
 - Lower voltage: 184 V
 - Upper voltage: 276 V
 - Lower frequency: 47 Hz
 - Upper frequency: 52 Hz
 - Observation time: 30 s
- Reconnection after tripping**
 - Lower voltage: 184 V
 - Upper voltage: 276 V
 - Lower frequency: 47 Hz
 - Upper frequency: 52 Hz
 - Observation time: 30 s

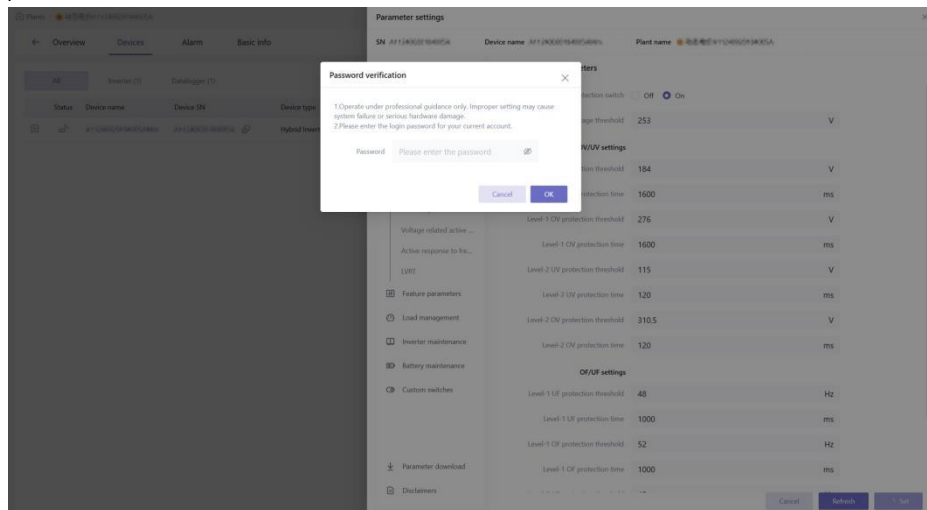
Step 4: Enter "Reactive mode" menu under "Reactive power control" menu and check reactive mode setpoints.

The screenshot shows the SOLINTEG Parameter settings interface. On the left, a sidebar lists various menu items: Plants, Devices, Alarm, Reports, and Manage. The 'Devices' menu is selected, showing a list of device status and SN. The main area displays the 'Parameter settings' for a specific device. The 'Reactive power control' menu is selected, and the 'Reactive mode' is set to Q(U). A dropdown menu is open, showing options: OFF, PF, Q(U), and Cos(φ). The Q(U) option is selected, and a tooltip explains that the PF is fixed at +1.000 and the reactive power can be regulated by the parameter PF (P0).

Step 5: Enter "Voltage related active power P(U)" menu and check active mode setpoints.

The screenshot shows the SOLINTEG Parameter settings interface. On the left, a sidebar lists various menu items: Plants, Devices, Alarm, Reports, and Manage. The 'Devices' menu is selected, showing a list of device status and SN. The main area displays the 'Parameter settings' for a specific device. The 'Voltage related active power P(U)' menu is selected, and the 'P(U) curve switch' is set to On. The 'P(U) curve start voltage' is 248.4 V, 'Power of P(U) curve start voltage' is 100 %, 'P(U) curve end voltage' is 257.6 V, 'Power of P(U) curve end voltage' is 10 %, and 'P(U) time constant (τ)' is 5 s.

Step 6: Once the installers or operators have finished modifying the relevant parameters, they need to enter a password after clicking "Set". Please reach out to Solinteg or the installer for the password.



Please enter the password to adjust Grid Code, Protection Parameters setpoints, Grid Connection Parameter setpoints, Reactive Modes and Active Modes setpoints. To obtain the password, please contact Solinteg.

Once the Grid Code and setpoints have been set at commissioning, these settings will be locked and cannot be edited unless a password is entered.

10. Troubleshooting

Solinteg hybrid inverter is designed in accordance with grid operation standards, and conform to the requirements of safety and EMC. The inverter had passed a series of rigorous tests to ensure it runs sustainably and reliably before shipment.

10.1. Status Code

Inverter Status Codes indicate the current operating state of the inverter. They do not represent faults but aid in troubleshooting and analysis (Version 2026.07.02).

ID	Information	Solution
S01	Work mode not set	The inverter can't generate power normally due to the work mode isn't set. Configure a proper mode via the monitoring platform or inverter screen.
S02	Emergency stop enabled	This happened on the situation that someone operated the Emergency stop switch connected to the inverter. If not triggered manually, check whether the Emergency stop switch is correctly set on the device setting page of the monitoring platform.
S03	DC voltage out of range	(1) The inverter cannot generate power normally because the DC voltage exceeds the limit. Check the DC voltage to ensure that it is within the allowable range of the inverter. (2) Check whether the battery BMS status is normal.
S04	Grid voltage/frequency out of range	The inverter can't generate power due to grid voltage or frequency exceeding the permissible range. Check the grid voltage and frequency.
S05	On/Off-grid switch not enabled in Off-grid situation	If the inverter On/Off-grid switch is not turned on, the inverter cannot work properly in Off-grid situation. Please turn on the switch on the device setting page of the monitoring platform.
S06	No battery in Off-grid	The inverter can't operate in Off-grid situation without a battery. It will resume normal operation once the grid is restored.
S07	Operation stopped by command	The inverter stops power generation due to received a shutdown command. Restart it to resume power generation.
S08	Low SOC and no PV input in Off-grid situation	In the Off-grid situation, when the SOC is lower than the Off-grid SOC protection value or the battery discharge disabled, and no PV power, the inverter will enter waiting state. This problem will disappears when the SOC is higher than the trigger value or the PV side has power.
S09	Communication failure in parallel system	Communication failure of a slave inverter causes the master inverter to be in waiting state. Check the communication status of the slave inverter.
S10	Meter communication failure under hard	The inverter is in waiting state due to meter communication failure in Hard control of export limit. Check the meter communication

ID	Information	Solution
	control	status.
S11	Waiting for bypass state	The inverter is in bypass self-inspection after initial power-up. Normal operation will resume in about 15 seconds.
S12	Standby state after firmware upgrading	The inverter is waiting for entering bypass after a firmware upgrade. Normal operation will resume in about 30 seconds.
S13	Diesel generator fault	The inverter is in power limit due to an abnormal diesel generator. Check the generator's status.
S15	Off-grid Status	The inverter is currently operating in an off-grid state, this may be caused by the power grid outages or some misconfiguration of the inverter work mode.
S18	OverFrequency power limit	The inverter limits power due to grid frequency exceeding the allowable range of safety regulations. The issue will resolve automatically once the grid frequency returns to normal.
S19	OverTemperature power limit	The inverter limits power due to high temperatures in the power module or internal cavity. The issue will resolve automatically when the temperature decreases.
S20	OverCurrent power limit	The inverter limits power as output current reaches the maximum limit due to low grid voltage. The issue will resolve automatically once the grid voltage returns to normal.
S21	Reactive power limit	$S^2 = Q^2 + P^2$. When the inverter's reactive power control is disabled, $Q^2 = 0$, so $S^2 = P^2$, meaning the inverter's active power output is not limited by apparent power. However, when reactive power control is enabled, Q^2 becomes positive. With the maximum apparent power S^2 remaining constant, the inverter's active power output P^2 will be limited. The active power output will automatically resume to normal once the reactive power output decreases.
S22	Export limit enabled	The inverter limits power due to the export limitation is enabled. Check the export limit settings and ignore the alert if correct.
S23	Slow loading power	The inverter loading power slowly due to the regulatory requirements at the inverter start-up and reconnection.
S24	Overvoltage power limit	The inverter limits power due to AC voltage exceeding the allowable range. The issue resolves automatically once the grid voltage returns to normal.
S25	System power limit	The inverter actively reduces power output when the On-grid port power exceeds specifications.
S26	EMS command limit	The inverter limits power based on external EMS dispatch commands. Ignore the alert if EMS equipment is connected.

ID	Information	Solution
S35	Entry State 3 of G100	During G100 export limit control, if the power surge frequency/duration exceeds the limit, or communication/internal faults occur, CLS enters fault states 3. This fault can be cleared by sending a reset command.
S36	Lock State 3 of G100	For residential projects: If the G100 has been reset 3 times within 30 days and becomes locked in State 3 again, contact the installer for resolution. For commercial and industrial projects: The G100 remains locked for 4 hours after entering State 3.
S37	No Grid Voltage	Inverter detects no grid voltage.
S38	EMS Comm. Lost	When the EMS communication is interrupted, the communication watchdog will be activated, and the inverter will automatically switches to General Mode. Once communication is restored, it will resume operation according to the configured settings.

10.2. Fault Information and Troubleshooting

When a fault occurs, the corresponding error message will be shown on the display, and in this case, the inverter might stop feeding into grid. The fault messages and their corresponding troubleshooting methods are listed below (Version 2026.07.02):

ID	Information	Solution
E001	DC BUS Over Voltage	1. Check whether the DC input voltage exceeds the inverter maximum operating voltage. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E002	Mains Lost	No grid connection detected. The AC switch or circuit may be open. 1. Check whether the grid voltage is normal. 2. Check whether the AC wiring is correct and whether the AC circuit breaker is in normal condition. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E003	Grid Voltage Fault	The inverter has detected that the AC voltage exceeds the safety regulation limits. 1. Verify that the safety code is correct. 2. Check whether the AC-side wiring is correct. 3. Check whether the cross-sectional area of the AC cable is sufficient. Confirm that the wire size matches the power rating. If excessive line impedance causes the grid voltage to rise beyond the limit, replace the cable with one of a larger cross-section. 4. If permitted by the utility company, widen the inverter's

ID	Information	Solution
		voltage protection range. 5. If the issue persists, please contact your installer or our technical support team for further assistance.
E004	Grid Frequency Fault	The inverter has detected that the AC frequency exceeds the safety regulation limits. 1. Verify that the safety code is correct. 2. Occasional frequency anomalies may occur due to grid fluctuations; the inverter will automatically resume operation once the grid recovers. 3. If permitted by the utility company, widen the inverter frequency protection range. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
E005	DCI Fault	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E006	ISO Over Limitation	An insulation fault was detected on the DC side due to low resistance to ground. 1. Check whether the PV modules, batteries, DC cables, and connectors are damaged or have water ingress. 2. Use an insulation resistance tester to measure the insulation impedance between the DC side and the ground. The measured value should not be lower than 500 kΩ. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E007	GFCI Fault	An excessive ground leakage current was detected on the inverter. 1. Check whether the PV modules, batteries, DC cables, and connectors are damaged or have water ingress. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E008	PV Over Voltage	PV input voltage exceeds inverter's allowable upper limit. 1. Reduce the number of PV modules to ensure that the open-circuit voltage of each string is lower than the inverter's maximum operating voltage 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E009	Over Temperature	1. Check whether the inverter installation location is well ventilated. 2. Try shutting down the inverter for a period of time and restarting it after the temperature drops. 3. If the issue persists, please contact your installer or our technical support team for further assistance.

ID	Information	Solution
E010	N-PE Check Fault	The ground cable is loose or in poor connection on back-up side. 1. Check whether the ground cable wiring is correct. 2. If grounding is unnecessary, N-PE check function can be disabled.
E011	Inverter Over Freq	Abnormal load on the backup side during off-grid operation. 1. Check whether there is an impact load on the back-up side and whether the load power is too high. 2. Check whether back-up side is short circuit.
E012	BAT Voltage Fault	1. The inverter has detected a sudden change in battery voltage. If it does not recover automatically, restart the battery. 2. Reduce the number of batteries to ensure that the maximum battery voltage is lower than the inverter maximum operating voltage. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E013	Backup Voltage Fault	1. Abnormal voltage input on the backup side, check if the backup side is connected to the power supply. 2. Backup side internal relay damaged.
E014	HW Fault	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E015	Backup Load Fault	Backup side load exceeds carrying capacity. 1. Reduce the load on the backup side 2. Check the battery's load-carrying capacity
E016	Inverter Over Voltage	1. During off-grid operation, backup side voltage exceeds the safety regulations. 2. Internal circuit abnormality, Check whether back-up side is short circuit. Check whether there is an impact load on the back-up side and whether the load power is too high.
E017	Inverter Over Current	Abnormal load on the backup side during off-grid operation. 1. Check whether there is an impact load on the back-up side and whether the load power is too high. 2. Check whether back-up side is short circuit.
E018	FLASH Fault	1. The issue may be caused by interference. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E019	SCI Fault	1. The issue may be caused by interference. Restart the inverter.

ID	Information	Solution
		2. If the issue persists, please contact your installer or our technical support team for further assistance.
E020	SPI Fault	1. The issue may be caused by interference. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E021	E2 Fault	1. The issue may be caused by interference. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E022	GFCI Device Fault	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E023	AC Transducer Fault	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E024	Relay Check Fail	1. Use a multimeter to measure the voltage between the neutral and ground wires. If the voltage exceeds 10 V, it indicates an abnormal connection on the grid side neutral or ground line. 2. Restart the inverter. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E025	Internal Fan Fault	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E026	External Fan Fault	1. Check whether the fan is blocked by foreign objects. If so, clean it. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E028	DC BUS Voltage Low	1. Check whether the DC voltage is normal. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E029	On-grid Meter Comm Fault	Inverter-On-grid Meter communication error detected. 1. Check whether the communication cable between the inverter and the meter is properly connected. 2. Verify that the energy meter model is compatible. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E030	DC Arc Fault	1. Check the PV side for loose terminals or damaged cables

ID	Information	Solution
		that may cause arcing. 2.Restart the inverter. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E031	AFCI Comm Fault	1. The issue may be caused by interference. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E032	Bus Voltage Hard Fault	1. Check whether the DC input voltage exceeds the inverter maximum operating voltage. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E033	DC BUS Voltage Unbalance	1.Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E034	Backup Over Current	1.Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E035	Backup Box Fault	1. Check whether the backup box(EDA) is connected correctly. If it is not connected, disable the backup box detection function. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E037	Phase Order Error	1. Check whether the grid wiring matches the configured phase sequence. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
E038	Third-party Meter Comm Fault	1. Check the communication cable between the inverter and the meter. 2. Verify that the energy meter model is compatible. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
E039	Grid Phase Abnormality	Grid phase detection abnormal. 1. Check whether the grid voltage has three-phase unbalance or phase deviation abnormalities.
E040	PV Current Mutation Fault	1. Check whether the PV terminals are securely connected. 2. Check whether the string configuration exceeds the maximum input rating of the inverter terminals.
E041	ADC Interrupt Timeout Fault	Device sampling abnormal. 1. Restart the device and verify whether the fault is cleared.

ID	Information	Solution
		2. Check whether the communication cable between the control board and sampling board is loose. 3. Check for abnormal interference or possible hardware damage inside the equipment. 4. If the issue persists, contact technical support for further assistance.
E042	PV Reverse	PV string polarity reversed. 1. Completely power down the device and check whether any PV string is connected with reversed polarity. 2. If so, correct the string wiring. 3. If the issue persists, contact technical support for further assistance.
E043	Contactor Fault	Drive circuit fault, inconsistent feedback signal, or contactor sticking. 1. Check whether the feedback wiring of the contactor is loose. 2. Measure coil resistance and verify whether the drive voltage is normal. 3. Check whether the contacts are mechanically stuck or welded; replace the contactor if necessary.
E044	Battery Current Sensor Fault	If the issue cannot be resolved after restart, please contact technical support for further assistance.
E400	BMS Comm Fault -BAT1	Inverter-battery BMS communication error detected. 1. Check whether the selected battery model is correct. 2. Verify that communication between the BMS master and the inverter is properly established. 3. Check whether the battery is in normal status. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
E431	Abnormal Battery Voltage -BAT1	A large difference between the battery voltage measured by the inverter and that reported by the BMS indicates a possible communication or sampling issue. 1. Check whether the battery power cables are properly and securely connected. 2. Check whether the battery circuit breaker, switch, or fuse is in normal condition. 3. Check whether the battery has an alarm or protection status preventing output. Clear any faults and restart the battery after reinstallation. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
E432	Abnormal BAT Parallel No. -BAT1	Contains offline battery clusters. 1. Check if each cluster is powered on. If any cluster without

ID	Information	Solution
		power, turn on the DC breaker of each battery/cluster and re-execute the parallel process. 2.Check if there is any alarm or protection in any cluster. If any alarm or protection, resolve it and re-execute the parallel process. 3.Check if the voltage deviation between batteries/clusters is $\leq 2.5V$. If anything abnormal, charge or discharge the batteries/cluster to ensure the voltage deviation $\leq 2.5V$ and then re-execute the parallel process.
E489	BMS Comm Fault -BAT2	Inverter-battery BMS communication error detected. 1. Check whether the selected battery model is correct. 2. Verify that communication between the BMS master and the inverter is properly established. 3. Check whether the battery is in normal status. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
E490	Abnormal Battery Voltage -BAT2	A large difference between the battery voltage measured by the inverter and that reported by the BMS indicates a possible communication or sampling issue. 1. Check whether the battery power cables are properly and securely connected. 2. Check whether the battery circuit breaker, switch, or fuse is in normal condition. 3. Check whether the battery has an alarm or protection status preventing output. Clear any faults and restart the battery after reinstallation. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
E491	Abnormal BAT Parallel No. -BAT2	Contains offline battery clusters. 1.Check if each cluster is powered on. If any cluster without power, turn on the DC breaker of each battery/cluster and re-execute the parallel process. 2.Check if there is any alarm or protection in any cluster. If any alarm or protection, resolve it and re-execute the parallel process. 3.Check if the voltage deviation between batteries/clusters is $\leq 2.5V$. If anything abnormal, charge or discharge the batteries/cluster to ensure the voltage deviation $\leq 2.5V$ and then re-execute the parallel process.
W001	Other Faults	1.Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W002	PV Power Low	1. Check whether the PV connection and PV energy generation are normal.

ID	Information	Solution
		2. Check the battery operating status and confirm that the battery output capability is not limited. 3. If the issue persists, please contact your installer or our technical support team for further assistance.
W003	BAT Power Low	When off-grid or during grid disconnection, if the battery status is abnormal or unable to supply power: 1. Check battery power cable connections. 2. Check the battery circuit breaker, switch, or fuse. 3. Check for alarms or protections and restart the battery after resolving the issue. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
W004	DC BUS Voltage Unbalance	1. Restart the inverter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W005	Phase Lock Fault	1. Check whether the grid connection is correct. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W006	BAT Invalid	When off-grid or during grid disconnection, if the battery status is abnormal or unable to supply power: 1. Check battery power cable connections. 2. Check the battery circuit breaker, switch, or fuse. 3. Check for alarms or protections and restart the battery after resolving the issue. 4. If the issue persists, please contact your installer or our technical support team for further assistance.
W007	High-impedance Control Fault	1. High impedance in cables or the system may cause three-phase unbalance oscillation. Disable the three-phase unbalance function. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W008	Comm Cmd Off	1. The inverter may have stopped due to E-stop, watchdog, RCR, or DRM commands. Check related settings and command statuses. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W009	Meter Comm Fail	1. Check the communication cable between the inverter and the meter. 2. If the issue persists, please contact your installer or our technical support team for further assistance.
W010	Nbus Hardware	Nbus circuit detected hardware overcurrent. 1. Check whether half-wave load or inrush/shock loads

ID	Information	Solution
	Overcurrent	exceed the allowable limit; if so, reduce the load accordingly. 2. Fully power down and restart the device. If the fault persists, contact technical support for inspection and repair.

11. Operation and Maintenance

11.1. Inverter Maintenance

11.1.1. Maintenance Steps



DANGER

Incorrect operation do cause the risk of inverter damage or personal injury. Please strictly follow electrical operation safety regulations when performing maintenance.

When performing inverter maintenance, please strictly follow the steps below:

- ✧ Select the "Stop" option on the inverter display or monitoring application to shut down the inverter.
- ✧ Turn off the battery via the battery button.
- ✧ Disconnect all AC circuit breakers.
- ✧ Disconnect the DC circuit breaker or switch on the battery side.
- ✧ Rotate the inverter's DC switch to the OFF position.
- ✧ Wait for 10 minutes to ensure complete discharge of capacitor energy.
- ✧ Confirm that all indicator lights are extinguished.



WARNING

- ✧ Keep unprofessional person away.
- ✧ A temporary alarm sign or barrier must be posted to keep unprofessional person away while performing electrical connection and maintenance.
- ✧ When the inverter has an alarm or in some special cases, the inverter will work in the by pass status. In the by pass status, the grid will supply power to the load. At this time, it is not allowed to maintain the DC side of the inverter, if you want to maintain the DC side, you must stop the power and disconnect the DC switch before maintenance.



CAUTION

- ✧ Any arbitrary replacement of internal components is forbidden. Please seek help from Solinteg for maintenance support. Otherwise, Solinteg will not take any responsibility.
- ✧ Please remember not to do the self-maintenance before being familiar with the proper instruction of the whole process.

11.1.2. Routine maintenance:

Items	Methods	Period
System clean	Check dust or foreign matter on the heat-sink, air inlet and outlet.	Once every 6-12 months
Electrical connection	Check whether the cables are in good connection.	Once every 6-12 months
Seal inspection	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is aging or not sealed.	Once every 12 months

11.2. Battery Maintenance

Installation and maintenance of batteries should be performed or supervised with professional knowledge about batteries.

Please contact your battery supplier for detailed installation and maintenance information.



WARNING

- ✧ Do not dispose battery in fire, or it may explode.
- ✧ Do not dismantle or break the battery. The electrolyte inside would be harmful to your body
- ✧ The battery has risk of electrical shock, the following scenario should be noticed during the operation.
 - Remove metal items from your body.
 - Use insulated tools.
 - Remove metal items from battery.
 - Turn off the DC breaker of the battery before assembling or disassembling battery terminals.
 - There is a risk of electrical shock if battery is unexpectedly grounded. Remove the grounding cable to avoid the electrical shock.

11.3. Earth Fault Alarm

When the PV array occur earth fault, the inverter will report the following alarm information.

The alarm system shall continue until the earth fault is corrected.

- ✧ The warning indicator shows red constantly, and the OLED display will display "ISO Over Limitation" or "GFCI Fault".
- ✧ The monitoring platform and APP will show warning messages. Users can set up to receive alarm information via E-Mail.



WARNING

Please ensure the inverter is installed in a high traffic area where the visual alarm (warning indicator) will be noticed.

11.4. Firmware Upgrade Precautions



WARNING

During firmware upgrade operations, strictly adhere to the following requirements to avoid unexpected risks.

Power Supply Constraints

The full upgrade process takes approximately 5 to 10 minutes. Throughout this period, do not disconnect all power sources simultaneously (at least one power source—AC grid, PV DC input, or energy storage battery—must remain active to sustain device operation). Complete power loss will cause firmware corruption, rendering the inverter inoperable and requiring factory return for repair.

Preconditions for External EMS Communication

Before initiating the upgrade, perform either of the following:

- ① Stop all EMS-initiated commands (charging/discharging schedules, power limits, remote controls, parameter read/write) targeting this unit via the EMS backend.
- ② Physically disconnect communication lines (RS485/TCP/4G) between the inverter and EMS.

During the upgrade, avoid persistent EMS command transmission as it may interrupt the firmware write process and cause upgrade failure.

Special Recommendations for Off-Grid Systems

Risk Warning: During off-grid system upgrades, if communication between the inverter and battery fails, abnormal power-offs in certain batteries may cause upgrade failure. Systems relying solely on battery power face instantaneous blackout risks, potentially leading to temporary load disconnection.

Operational Guidance: For off-grid systems, schedule upgrades during daylight hours with normal PV generation. Utilize continuous PV power supply to mitigate risks from battery power loss or transient interruptions, ensuring uninterrupted operations.

Appendix

Technical Parameters

M2HT-9.9K-19.9K-80

	M2HT-9.9K-80	M2HT-10K-80	M2HT-14.9K-80	M2HT-15K-80	M2HT-19.9K-80
PV Input					
Max. PV array power (kW)	20	20	30	30	40
Max. usable PV input power (kW)	20	20	30	30	40
Start-up voltage (V)	120	120	120	120	120
Start output voltage (V)	135	135	135	135	135
Max. PV input voltage (V)*	1000*	1000*	1000*	1000*	1000*
Rated PV input voltage (V)	620	620	620	620	620
Operating voltage range (V)*	120-950*	120-950*	120-950*	120-950*	120-950*
Rated power MPP voltage range (V)	130-850	130-850	200-850	200-850	250-850
No. of MPP trackers	4	4	4	4	4
No. of PV inputs per MPPT	1	1	1	1	1
Max. PV input current (A)	20/20/20/20	20/20/20/20	20/20/20/20	20/20/20/20	20/20/20/20
Max. short-circuit current (A)	25/25/25/25	25/25/25/25	25/25/25/25	25/25/25/25	25/25/25/25
Battery Side					
Battery type	Lithium Battery (with BMS)				
Battery communication mode	CAN				
Battery voltage range (V)	130-900				
No. of battery inputs	2	2	2	2	2
Max. charging/discharge current (A)	40+40/40+40	40+40/40+40	40+40/40+40	40+40/40+40	40+40/40+40
Short circuit current rating for the Battery input (A)	100+100	100+100	100+100	100+100	100+100
Grid Side/On-grid					
Rated output power (kW)	9.999	10.0	14.9	15.0	19.9
Max. output power (kW)	9.999	10.0	14.9	15.0	19.9
Rated output apparent power (kVA)	9.999	10.0	14.9	15.0	19.9
Max. output apparent power (kVA)	9.999	10.0	14.9	15.0	19.9
Rated output voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated output frequency (Hz)	50/60				
Rated output current (A)	15.2/14.5/13.9	15.2/14.5/13.9	22.6/21.6/20.7	22.7/21.7/20.8	30.2/28.8/27.6
Max. output current (A)	17.6	17.6	26.1	26.2	34.9
Power factor	0.8 leading ...0.8 lagging				
Max. total harmonic distortion	<3% @Rated output power				
DCI	<0.5%In				
Max. charging power of battery (kW)	9.999	10.0	14.9	15.0	19.9
Max. input apparent power (kVA)**	20.0	20.0	30.0	30.0	40.0
Rated input voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				

	M2HT-9.9K-80	M2HT-10K-80	M2HT-14.9K-80	M2HT-15K-80	M2HT-19.9K-80
Rated input frequency (Hz)	50/60				
Max. input current (A)	30.3	30.3	45.5	45.5	60.6
Back-up Side/Off-grid					
Rated output power (kW)	9.999	10.0	14.9	15.0	19.9
Max. output power (kW)	9.999	10.0	14.9	15.0	19.9
Rated output apparent power (kVA)	9.999	10.0	14.9	15.0	19.9
Max. output apparent power (kVA)	9.999	10.0	14.9	15.0	19.9
Rated output current (A)	15.2/14.5/13.9	15.2/14.5/13.9	22.6/21.6/20.7	22.7/21.7/20.8	30.2/28.8/27.6
Max. output current (A)	17.6	17.6	26.1	26.2	34.9
On/Off-grid switching time	<10ms	<10ms	<10ms	<10ms	<10ms
Rated output voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated output frequency (Hz)	50/60				
Peak output apparent power (kVA)	20 @10s	20 @10s	30 @10s	30 @10s	40 @10s
Voltage harmonic distortion	<3% @Linear load				
Generator Side					
Max. input apparent power (kVA)	12.0	12.0	17.9	18.0	23.9
Max. charging power of battery (kW)	9.999	10.0	14.9	15.0	19.9
Rated input voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated input frequency (Hz)	50/60				
Max. input current (A)	18.2	18.2	27.1	27.3	36.2
Efficiency					
Max. efficiency	97.60%	97.60%	97.60%	97.60%	97.60%
European efficiency	97.10%	97.10%	97.10%	97.10%	97.10%
MPPT efficiency	99.90%	99.90%	99.90%	99.90%	99.90%
Protection					
DC reverse polarity protection	Yes				
Battery input reverse connection protection	Yes				
Insulation resistance protection	Yes				
Over-temperature protection	Yes				
Residual current protection	Yes				
Islanding protection	Yes(Phase Shift)				
AC over-voltage protection	Yes				
Overload protection	Yes				
AC short-circuit protection	Yes				
Surge protection	PV Type II / AC Type II				
General Data					
Over voltage category	II(PV+Battery), III(Mains)				
Dimensions (mm)	580*535*238(W*H*D)				
Weight (KG)	36	36	36	36	36
Ingress protection	IP66				
Protective class	I				

	M2HT-9.9K-80	M2HT-10K-80	M2HT-14.9K-80	M2HT-15K-80	M2HT-19.9K-80
Standby self-consumption (W)	<15	<15	<15	<15	<15
Inverter topology	Transformerless				
Operating temperature range (°C)	-30~60				
Relative humidity (%)	0~100				
Operating altitude (m)	3000				
Cooling	Natural Convection	Natural Convection	Smart fan	Smart fan	Smart fan
Noise level (dB)	<25	<25	<65	<65	<65
Display	OLED & LED				
Communication	CAN, RS485, WiFi/LAN (Optional)				

M2HT-20K-30K-80

	M2HT-20K-80	M2HT-24.9K-80	M2HT-25K-80	M2HT-29.9K-80	M2HT-30K-80
PV Input					
Max. PV array power (kW)	40	50	50	50	50
Max. usable PV input power (kW)	40	50	50	50	50
Start-up voltage (V)	120	120	120	120	120
Start output voltage (V)	135	135	135	135	135
Max. PV input voltage (V)*	1000*	1000*	1000*	1000*	1000*
Rated PV input voltage (V)	620	620	620	620	620
Operating voltage range (V)*	120-950*	120-950*	120-950*	120-950*	120-950*
Rated power MPP voltage range (V)	250-850	320-850	320-850	380-850	380-850
No. of MPP trackers	4	4	4	4	4
No. of PV inputs per MPPT	1	1	1	1	1
Max. PV input current (A)	20/20/20/20	20/20/20/20	20/20/20/20	20/20/20/20	20/20/20/20
Max. short-circuit current (A)	25/25/25/25	25/25/25/25	25/25/25/25	25/25/25/25	25/25/25/25
Battery Side					
Battery type	Lithium Battery (with BMS)				
Battery communication mode	CAN				
Battery voltage range (V)	130-900				
No. of battery inputs	2	2	2	2	2
Max. charging/discharge current (A)	40+40/40+40	40+40/40+40	40+40/40+40	40+40/40+40	40+40/40+40
Short circuit current rating for the Battery input (A)	100+100	100+100	100+100	100+100	100+100
Grid Side/On-grid					
Rated output power (kW)	20.0	24.9	25.0	29.9	30.0
Max. output power (kW)	20.0	24.9	25.0	29.9	30.0
Rated output apparent power (kVA)	20.0	24.9	25.0	29.9	30.0
Max. output apparent power (kVA)	20.0	24.9	25.0	29.9	30.0
Rated output voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated output frequency (Hz)	50/60				
Rated output current (A)	30.3/29/27.8	37.7/36.1/34.6	37.9/36.2/34.7	45.3/43.3/41.5	45.5/43.5/41.7
Max. output current (A)	35.0	43.5	43.8	52.3	52.6

	M2HT-20K-80	M2HT-24.9K-80	M2HT-25K-80	M2HT-29.9K-80	M2HT-30K-80
Power factor	0.8 leading ...0.8 lagging				
Max. total harmonic distortion	<3% @Rated output power				
DCI	<0.5%In				
Max. charging power of battery (kW)	20.0	24.9	25.0	29.9	30.0
Max. input apparent power (kVA)**	40.0	50.0	50.0	60.0	60.0
Rated input voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated input frequency (Hz)	50/60				
Max. input current (A)	60.6	75.8	75.8	90.9	90.9
Back-up Side/Off-grid					
Rated output power (kW)	20.0	24.9	25.0	29.9	30.0
Max. output power (kW)	20.0	24.9	25.0	29.9	30.0
Rated output apparent power (kVA)	20.0	24.9	25.0	29.9	30.0
Max. output apparent power (kVA)	20.0	24.9	25.0	29.9	30.0
Rated output current (A)	30.3/29/27.8	37.7/36.1/34.6	37.9/36.2/34.7	45.3/43.3/41.5	45.5/43.5/41.7
Max. output current (A)	35	43.5	43.8	52.3	52.6
On/Off-grid switching time	<10ms	<10ms	<10ms	<10ms	<10ms
Rated output voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated output frequency (Hz)	50/60				
Peak output apparent power (kVA)	40 @10s	50 @10s	50 @10s	50 @10s	50 @10s
Voltage harmonic distortion	<3% @Linear load				
Generator Side					
Max. input apparent power (kVA)	24.0	29.9	30.0	35.9	36.0
Max. charging power of battery (kW)	20.0	24.9	25.0	29.9	30.0
Rated input voltage (V)	3L/N/PE; 220/380V;230/400V;240/415V				
Rated input frequency (Hz)	50/60				
Max. input current (A)	36.4	45.3	45.5	54.4	54.5
Efficiency					
Max. efficiency	97.60%	97.60%	97.60%	97.60%	97.60%
European efficiency	97.10%	97.10%	97.10%	97.10%	97.10%
MPPT efficiency	99.90%	99.90%	99.90%	99.90%	99.90%
Protection					
DC reverse polarity protection	Yes				
Battery input reverse connection protection	Yes				
Insulation resistance protection	Yes				
Over-temperature protection	Yes				
Residual current protection	Yes				
Islanding protection	Yes(Phase Shift)				
AC over-voltage protection	Yes				
Overload protection	Yes				
AC short-circuit protection	Yes				
Surge protection	PV Type II / AC Type II				
General Data					

	M2HT-20K-80	M2HT-24.9K-80	M2HT-25K-80	M2HT-29.9K-80	M2HT-30K-80
Over voltage category	II(PV+Battery), III(Mains)				
Dimensions (mm)	580*535*238(W*H*D)				
Weight (KG)	36	36	36	36	36
Ingress protection	IP66				
Protective class	I				
Standby self-consumption (W)	<15	<15	<15	<15	<15
Inverter topology	Transformerless				
Operating temperature range (°C)	-30~60				
Relative humidity (%)	0~100				
Operating altitude (m)	3000				
Cooling	Smart fan	Smart fan	Smart fan	Smart fan	Smart fan
Noise level (dB)	<65	<65	<65	<65	<65
Display	OLED & LED				
Communication	CAN, RS485, WiFi/LAN (Optional)				

* The maximum PV input voltage is 950V. The inverter will stop operating when the voltage is between 950V and 1000V. The inverter will be damaged if the voltage exceeds 1000V.

** Max apparent power means the maximum power imported from the grid used to satisfy the backup loads and charge the battery.

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