Hybrid Inverter User Manual

contents

1. Notes on this manual

1.1 Scope of validity

This manual is an integral part of REVO series hybrid inverter, It describes the assembly, installation, commissioning, maintenance and failure of the product. Please read it carefully before operating.

R6KH3（R6KH3-P）	R8KH3（R8KH3-P）	R10KH3（R10KH3-P）	R12KH3（R12KH3-P）
R15KH3（R15KH3-P）			

Naming rules, For example:R8KH3
“R” means “REVO series”.
“8k” means “output power 8kW ”.
“H” means “Battery High Voltage”.
“3” means “Output three-phase” .
“P” means “PV current plus”.
Store this manual where it will be accessible at all times.

1.2 Target group

This manual is intended for qualified electricians. The tasks described in this manual can only be performed by qualified electricians.

1.3 Symbols used

The following types of safety instructions and general information appear in this document as described below:

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

Warning!
“Warning” indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Caution!
“Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Note!
“Note” provides tips that are valuable for the optimal operation of our product.

2. Safety

2.1 Important Safety Instructions

Danger!

Danger to life due to high voltages in the inverter ! All work must be carried out by qualified electrician

The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

Caution!

Danger of burn injuries due to hot enclosure parts!

During operation, the upper of the enclosure and the enclosure body may become hot.

Only touch the lower enclosure lid during operation.

Caution!

Possible damage to health as a result of the of radiation!

Do not stay closer than 20 cm to inverter for any length of time.

Note!

Grounding the PV generator.

Comply with the local requirements for grounding the PV modules and the PV generator. It is recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons.

Warning!

Ensure input DC voltage ≤Max. DC voltage .Over voltage may cause permanent damage to inverter or other losses, which will not be included in warranty!

Warning!

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

Warning!

Do not operate the inverter when the device is running.

Warning!
Risk of electric shock!

- Prior to the application, please read this section carefully to ensure correct and safe application. Please keep the user manual properly.
- Accessories only together with the inverter shipment are recommend here .other- wise may result in a risk of fire, electric shock, or injury to person.
- Make sure that existing wiring is in good condition and that wire is not undersized.
- Do not disassemble any parts of inverter which are not mentioned in installation guide. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty.
- Keep away from flammable, explosive materials to avoid fire disaster.
- The installation place should be away from humid or corrosive substance.
- Authorized service personnel must use insulated tools when installing or working with this equipment.
- PV modules shall have an IEC 61730 class A rating.
- Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both of them at the same time.
- The unit contains capacitors that remain charged to a potentially lethal voltage after the MAINS , battery and PV supply has been disconnected.
- Hazardous voltage will present for up to 5 minutes after disconnection from power supply.
- CAUTION-RISK of electric shock from energy stored in capacitor, Never operate on the inverter couplers, the MAINS cables, Battery cables, PV cables or the PV generator when power is applied. After switching off the PV , battery and Mains, always wait for 5minutes to let the intermediate circuit capacitors discharge before unplug DC ,battery plug and MAINS couplers.
- When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!
- Measure the voltage between terminals UDC+ and UDC- with a multi-meter(impedance at least 1Mohm) to ensure that the device is discharged before beginning work (35VDC) inside the device.

Surge protection devices (SPDs) for PV installation

Warning!
Over-voltage protection with surge arresters should be provided when the PV power system is installed.
The grid connected inverter is not fitted with SPDs in both PV input side and MAINS side.

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

- Induced surges are the most likely cause of lightning damage in majority or installations, especially in rural areas where electricity is usually provided by long overhead lines. Surge may be included on both the PV array conduction and the AC cables leading to the building.
- Specialists in lightning protection should be consulted during the end use application.
- Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.
- Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with external lightning protection system (LPS) when separation distance is kept.
- To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator, if the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 required for surge protection for electrical devices.
- To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumer's cutout), located between the inverter and the meter/distribution system; SPD (test impulse D1) for signal in according l to EN 61632-1.
- All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.
- Spark gap devices are not suitable to be used in DC circuits once conducting, they won't stop conducting until the voltage across their terminals is typically more than 30 volts.

Anti-Islanding Effect

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

PE Connection and Leakage Current

- The end-use application shall monitor the protective conductor by residual current operated protective device (RCD) with rated fault current Ifn≤240mA which automatically disconnects the device in case of a fault.
  The device is intended to connect to a PV generator with a capacitance limit of about 700nf.

Warning!
High leakage current!
Earth connection essential before connecting supply.

- Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic.
- Make sure that grounding conductor is adequately sized as required by safety regulations.

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

For United Kingdom

- The installation that connects the equipment to the supply terminals shall comply with the requirements of BS 7671.
- Electrical installation of PV system shall comply with requirements of BS 7671 and IEC 60364-7-712.
- No protection settings can be altered.
- User shall ensure that equipment is so installed, designed and operated to maintain at all times compliance with the requirements of ESQCR22(1)(a).

For Australia and New Zealand

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

Battery Safety Instructions

- Revo hybrid Series inverter should be worked with high voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 4.
- As accumulator batteries may contain potential electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:

  1: Do not wear watches, rings or similar metallic items.

  2: Use insulated tools.

  3: Put on rubber shoes and gloves.

  4: Do not place metallic tools and similar metallic parts on the batteries.

  5: Switch off load connected to the batteries before dismantling battery connection terminals.

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

2.2 Notes on this Manual Explanation of Symbol

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

Symbols on the Type Label

Symbol	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE
	TUV
	RCM remark.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation. Danger of high voltages.
	Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Observe enclosed documentation
	Do not dispose the inverter with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate this inverter unless it is isolated from battery, mains, and on-site PV generators.
	Danger to life due to high voltage. There is residual voltage existing in the inverter after powering off. which needs 5 min to discharge. Wait 5 min before you open the upper lid or the DC lid.

2.3 CE Directives

This chapter follows the requirements of the European low voltage directives, which contains the safety instructions and conditions of acceptability for the endues system, which you must follow when installing, operating and servicing the unit. If ignored, physical injury or death may follow, or damage may occur to the unit. Read this before you work on the unit. If you are unable to understand the dangers, warnings, cautions or instructions please contact an authorized service dealer before installing. Operating and servicing the unit.

The Grid connected inverter meets the requirement stipulated in Low Voltage Directive (LVD) 2014/35/EU and Electromagnetic Compatibility (EMC) Directive 2014/30/EU. The unit is based on: EN 62109-1:2010; EN 62109-2:2011; IEC 62109-1(ed.1); IEC62109-2(ed.1); EN 61000-6-3:2007+A: 2011; EN 61000-6-1:2007;EN 61000-6-2:2005;

In case of installation in PV system, startup of the unit (i.e. start of designated operation) is prohibited until it is determined that the full system meets the requirements stipulated in EC Directive (2014/35/EU, 2014/30/EU, etc.), The grid connected inverter leave the factory completely connecting device and ready for connection to the mains and PV supply ,the unit shall be installed in accordance with national wiring regulations. Compliance with safety regulations depends upon installing and configuring system correctly, including using the specified wires.

The system must be installed only by professional assemblers who are familiar with requirements for safety and EMC. The assembler is responsible for ensuring that the end system complies with all the relevant laws in the country where it is to be used.

The individual subassembly of the system shall be interconnected by means of the wiring methods outlined in national/international such as the national electric code (NFPA) No.70 or VDE regulation 0107.

3. Introduction

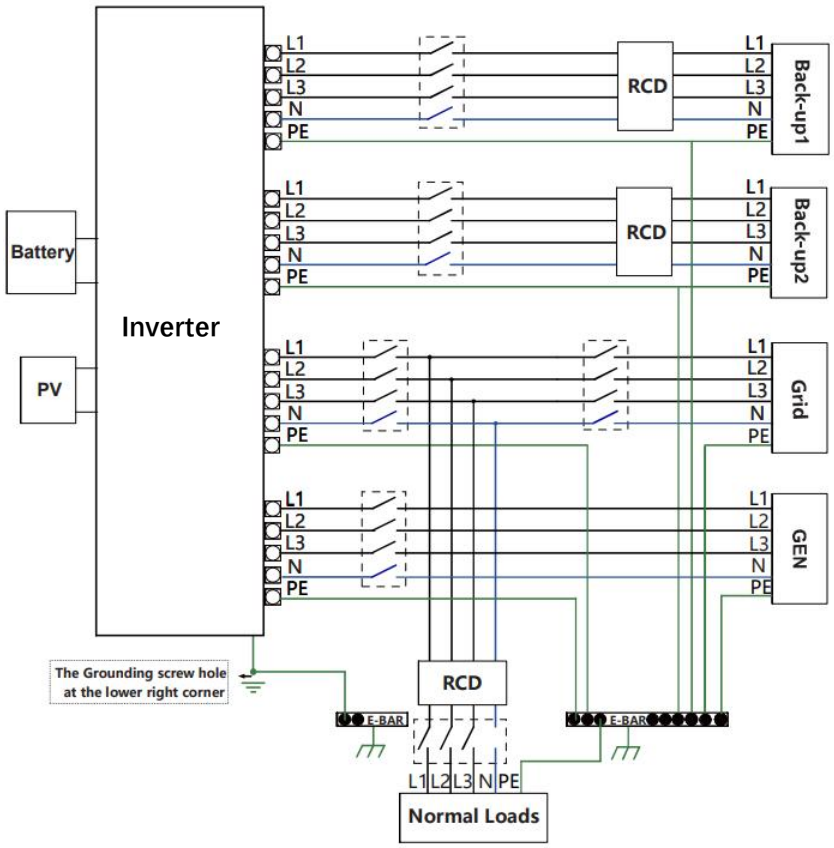
3.1 Basic features

Revo Hybrid Series is a high-quality inverter which can convert solar energy to AC energy and store energy into battery.
The inverter can be used to optimize self-consumption, store in the battery for future use or feed in to public grid. Work mode depends on PV energy and user's preference. It can provide power for emergency use during the grid lost by using the energy from battery and inverter generated from PV.

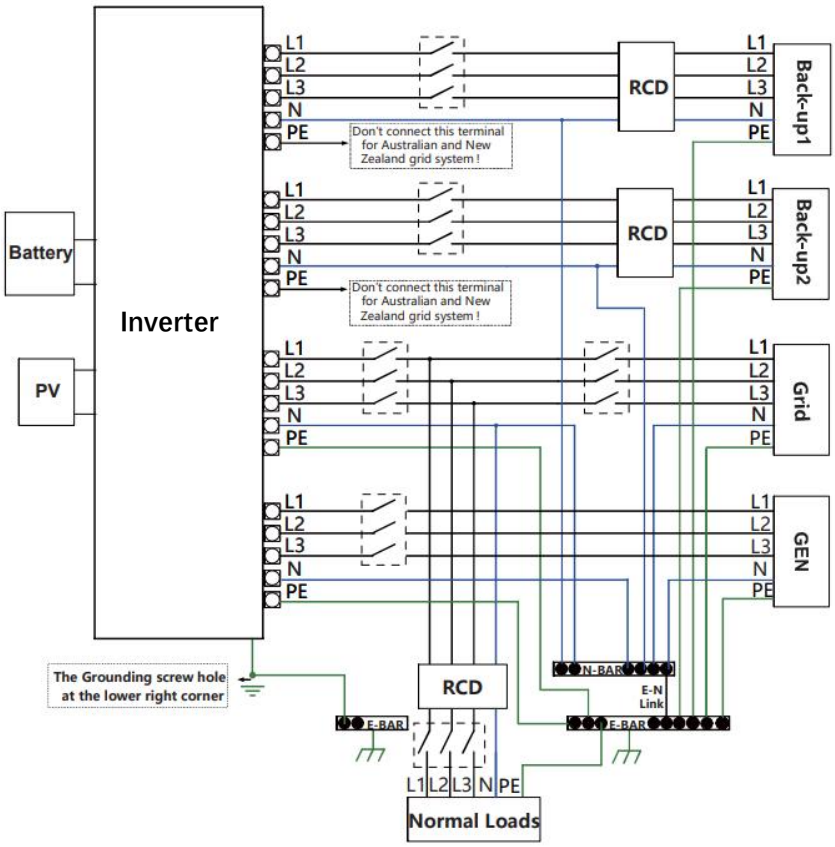
System Diagram

Revo Hybrid Series is designed with two EPS versions for customer to choose based on the local rules.

E Version applies to the wiring rules that requires the Live line and N (Neutral) line of EPS must be disconnected with the Live line and N (Neutral) line of grid (applies to most countries).



I Version applies to the wiring rules that requires N (Neutral) line of alternative supply must NOT be isolated or switched (applies to wiring rules AS/NZS_3000:2012 for Australia and New Zealand).



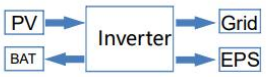
Note!

- Please control the home loads, and make sure it's within the "EPS output rating" under EPS mode, otherwise the inverter will Shut down with an "overload fault" warning.
- Please confirm with the mains grid operator whether there is any special regulations for grid connection.
- The wiring diagram is for reference only, and the complete electrical connection shall meet the requirements of local regulations.
- Do not misconnect the phase sequence. Otherwise, the inverter cannot run normally.

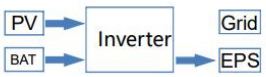
3.2 Work modes

Inverter provides multiple work modes based on different requirements.
synonymy：Back-UP/EPS/LOAD

Work modes: Self-use



1.When PV, Grid, Battery is available:
A. Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, solar energy excess power will provides to charge battery, and then reduntant power will feed to grid.



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

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

2 .When PV, Grid is available□without battery):

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

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

3 .When PV, Battery is available□Grid is disconnected):

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

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

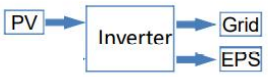
Work modes: Peak shift

1.When PV, Grid, Battery is available:

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

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

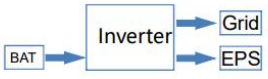
C. On discharge time, solar energy provides power to the loads as first priority, if solar energy is sufficient to supply loads ,and if there's still some extra energy from solar energy ,then the excess power and battery will deliver the power to the grid at the same time.



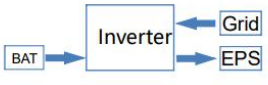
D. In the period of no charge or discharge, the solar power supply loads at first priority , excess energy to the grid.

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

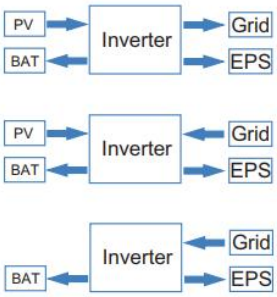
A. On charge time, grid will charge battery and supply power to the connected loads at the same time.



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



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



Work modes: Bat priority

1. When PV, Grid, Battery is available:
A. Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load. If there's still some extra energy, then the excess power will feed the power to grid .

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

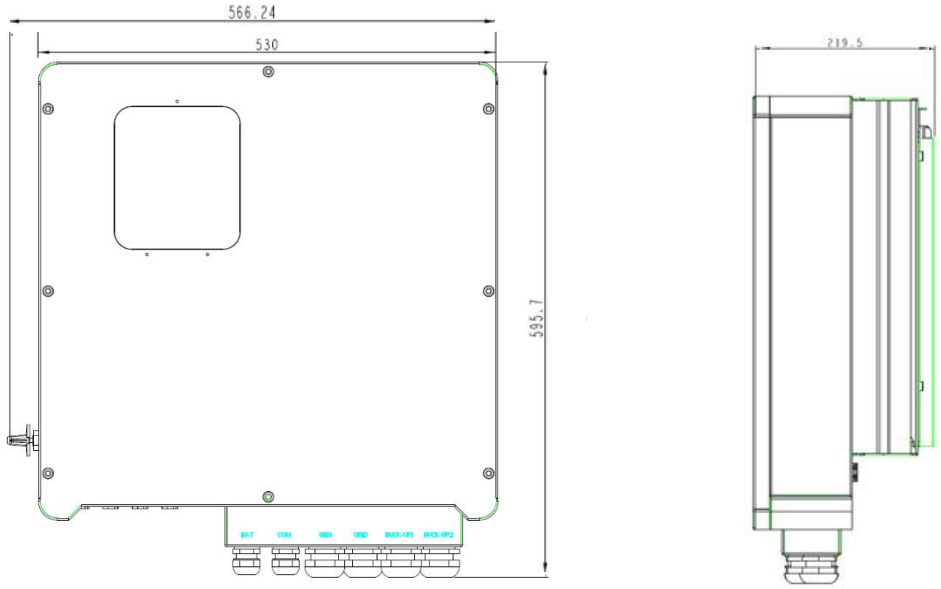
2. When Grid,Battery is available (PV is disconnected):
Grid will supply power to load and charge battery at the same time.

Note!

- If set anti-Reverse function allowable, Once on the work mode of Self-use, Peak shift, battery priority, the system will not feed power to grid.

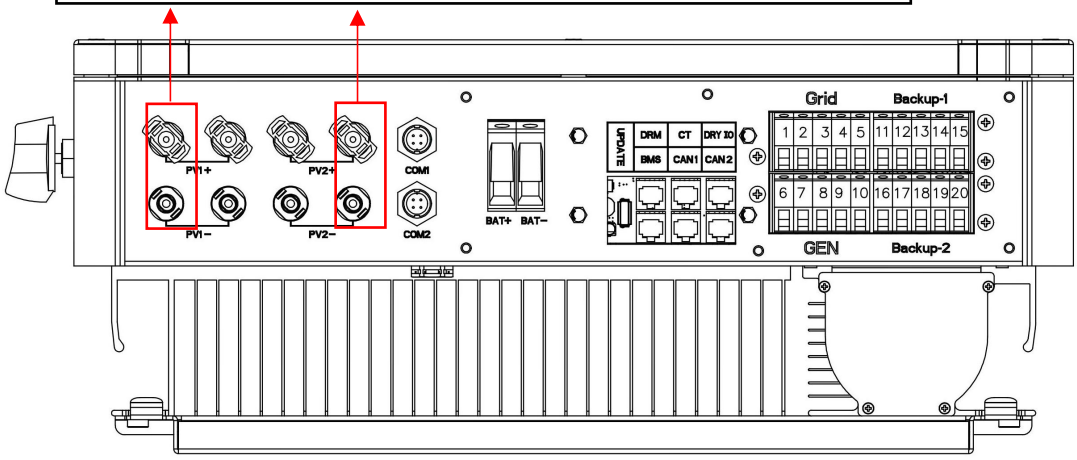
3.3 Dimensions

Unit: mm



3.4 Terminals of Hybrid inverter

R15KH3 this plugs used , other inverter models plugs are reserved.



Function	label	Description
PV string 1 Input port	PV1+	PV string 1 positive input
	PV1-	PV string 1 negative input
PV string 2 Input port	PV2+	PV string 2 positive input
	PV2-	PV string 2 negative input
Communication interface	COM1	485 port
	COM2	WiFi port (optional) and GPRS port(optional)
BAT Port	BAT+	Battery Positive input
	BAT-	Battery negative input
signal line interface	UPDATE	Upgrading software Ports
	DRM	Function temporarily retained
	CT	Connect to CT (current transformer)
	DRY IO	Dry contact
	BMS	BMS communication to Battery
	CAN1	Parallel machine CAN
	CAN2	Parallel machine CAN
Grid	①	Grid line A phase
	②	Grid line B phase
	③	Grid line C phase
	④	Grid line null line
	⑤	Grid line ground electrode
GEN	⑥	A phase
	⑦	B phase
	⑧	C phase
	⑨	Null line
	⑩	Ground electrode

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

4. Technical data

Model		R6KH3	R8KH3	R10KH3	R12KH3	R15KH3
PV Input	Max PV array power	9kW	12kW	15kW	18kW	22.5kW
	Max input voltage	1000 V				
	MPPT voltage range	180 V ~ 850 V				
	Min input voltage / start voltage	125V/180V				
	No of independent MPPT trackers / strings per MPPT input	2 / (1/1)				2(2/2)
	Max input current per MPPT tracker	13 A/13A				13A/13A
	Max short-circuit current per MPPT tracker	16A/16A				25A/25A
Battery	Battery type	Lithium and Lead Acid Battery				
	Battery voltage range	125V ~ 600 V				
	Battery operating voltage range	150V ~ 550 V				
	Max charging current / Max discharging current	50 A / 50A				
	Rated charging current / Rated discharging current	40A/40A				
AC output	Nominal AC voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	AC voltage range	360V~440V				
	Rated AC grid frequency	50 Hz / 60 Hz				
	AC grid frequency range	50 Hz±5Hz / 60 Hz±5Hz				
	Rated active power	6 kW	8 kW	10 kW	12 kW	15 kW
	Rated apparent power	6kVA	8kVA	10kVA	12kVA	15kVA
	Max apparent power	6.6kVA	8.8kVA	11 VA	13.2kVA	16.5kVA
	Rated grid output Current (400V)	8.7A	11.5A	14.4A	17.3A	21.7 A
	Max grid output current	9.5A	12.7A	15.9A	19.1A	23.8A
	Harmonics THDI (Nominal power)	< 3%				
AC input	Rated grid voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	Rated grid frequency	50Hz / 60Hz				
BACKUP output	Nominal output voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	Nominal output frequency	50 Hz / 60 Hz				
	Rated apparent power	6kVA	8kVA	10kVA	12kVA	15kVA
	Max output apparent power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
	Peak output apparent power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
	Rated Current (400V)	8.7A	11.5 A	14.4A	17.3 A	21.7A
	Max output current	9.5A	12.7A	15.9A	19.1A	23.8A

Installation

Model		R6KH3	R8KH3	R10KH3	R12KH3	R15KH3
Safety protection	PV string reverse polarity protection	●				
	All-pole sensitive residual current monitoring unit	●				
	Anti-islanding protection	●				
	AC output over current protection	●				
	AC output short circuit current protection	●				
	AC over voltage protection	●				
	Protection class (as per IEC 62109-1)	I				
	Overvoltage category (as per IEC 62109-1)	AC: III; DC: II				
General data	Power factor at rated power / adjustable displacement	0.99 / 0.8 leading to 0.8 lagging				
	Dimensions (W / H / D)	566 / 593.5 / 219.5 mm				
	Device weight	32 kg				
	Installation	Wall-mounted				
	Operating temperature range	-25 °C~+60 °C				
	Noise emissions (typical)	< 45 dB(A)				
	Cooling concept	Natural convection				
	Ingress protection rating (as per IEC 60529)	IP65				
	Max permissible value for relative humidity (non-condensing)	0~95%				
	Max operating altitude	4000m (>2000m power derating)				
Features	Inverter topology (Solar/ battery)	Transformer less / Transformer less				
	User interface	LED & App				
	Communication with BMS	CAN				
	Communication with meter	RS485				
	Communication with portal	WIFI stick				
	Integrated power control / Zero export control	● / ●				
Standard Compliance	Safety	EN 62109-1, EN 62109-2				
	EMC	IEC 61000-6-1/-2/-3/-4, IEC 61000-3-11, IEC61000-3-12				

Model		R6KH3-P	R8KH3-P	R10KH3-P	R12KH3-P	R15KH3-P
PV Input	Max PV array power	9kW	12kW	15kW	18kW	22.5kW
	Max input voltage	1000 V				
	MPPT voltage range	180 V ~ 850 V				
	Min input voltage / start voltage	125V/180V				
	No of independent MPPT trackers / strings per MPPT input	2 / (1/1)				2(2/2)
	Max input current per MPPT tracker	18A/18A				20A/20A
	Max short-circuit current per MPPT tracker	25A/25A				30A/30A
Battery	Battery type	Lithium and Lead Acid Battery				
	Battery voltage range	125V ~ 600 V				
	Battery operating voltage range	150V ~ 550 V				
	Max charging current / Max discharging current	50 A / 50A				
	Rated charging current / Rated discharging current	40A/40A				
AC output	Nominal AC voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	AC voltage range	360V~440V				
	Rated AC grid frequency	50 Hz / 60 Hz				
	AC grid frequency range	50 Hz±5Hz / 60 Hz±5Hz				
	Rated active power	6 kW	8 kW	10 kW	12 kW	15 kW
	Rated apparent power	6kVA	8kVA	10kVA	12kVA	15kVA
	Max apparent power	6.6kVA	8.8kVA	11 VA	13.2kVA	16.5kVA
	Rated grid output Current (400V)	8.7A	11.5A	14.4A	17.3A	21.7 A
	Max grid output current	9.5A	12.7A	15.9A	19.1A	23.8A
	Harmonics THDI (Nominal power)	< 3%				
AC input	Rated grid voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	Rated grid frequency	50Hz / 60Hz				
BACKUP output	Nominal output voltage	3W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V				
	Nominal output frequency	50 Hz / 60 Hz				
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	Max output apparent power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
	Peak output apparent power	6.6kVA	8.8kVA	11kVA	13.2kVA	16.5kVA
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	Max output current	9.5A	12.7A	15.9A	19.1A	23.8A
Safety protection	PV string reverse polarity protection	●				
	All-pole sensitive residual current monitoring unit	●				
	Anti-islanding protection	●				

Installation

Model		R6KH3-P	R8KH3-P	R10KH3-P	R12KH3-P	R15KH3-P
	AC output over current protection	●				
	AC output short circuit current protection	●				
	AC over voltage protection	●				
	Protection class (as per IEC 62109-1)	I				
	Overvoltage category (as per IEC 62109-1)	AC: III; DC: II				
General data	Power factor at rated power / adjustable displacement	0.99 / 0.8 leading to 0.8 lagging				
	Dimensions (W / H / D)	566 / 593.5 / 219.5 mm				
	Device weight	32 kg				
	Installation	Wall-mounted				
	Operating temperature range	-25 °C~+60 °C				
	Noise emissions (typical)	< 45 dB(A)				
	Cooling concept	Natural convection				
	Ingress protection rating (as per IEC 60529)	IP65				
	Max permissible value for relative humidity (non-condensing)	0~95%				
	Max operating altitude	4000m (>2000m power derating)				
Features	Inverter topology (Solar/ battery)	Transformer less / Transformer less				
	User interface	LED & App				
	Communication with BMS	CAN				
	Communication with meter	RS485				
	Communication with portal	WIFI stick				
	Integrated power control / Zero export control	● / ●				
Standard Compliance	Safety	EN 62109-1, EN 62109-2				
	EMC	IEC 61000-6-1/-2/-3/-4, IEC 61000-3-11, IEC61000-3-12				

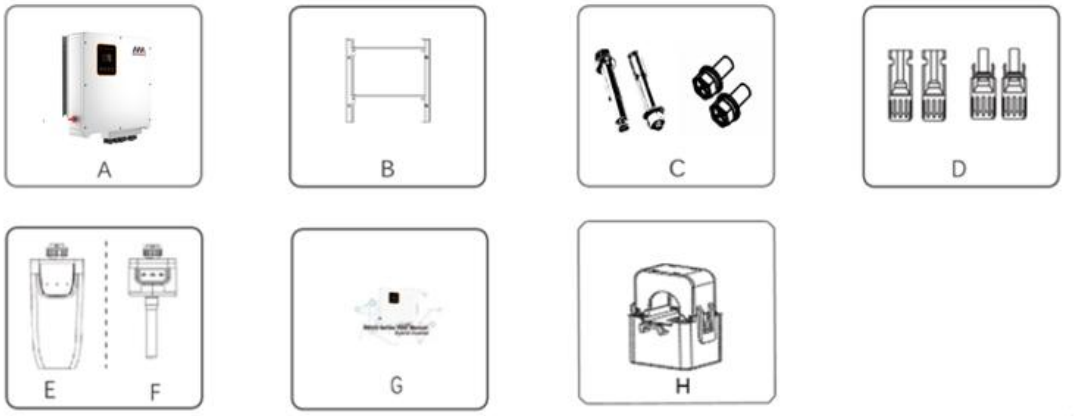
5. Installation

5.1 Check for physical damage

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

5.2 Packing list

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



Object	Description
A	Inverter
B	Bracket
C	Expansion screws and pan-head screws
D	PV connectors (8K-12K model 2* positive pole, 2* negative pole, 15K model 4* positive pole, 4* negative pole)
E	WiFi module (optional)
F	GPRS module (optional)
G	User manual
H	Current transformer(CT)

5.3 Mounting

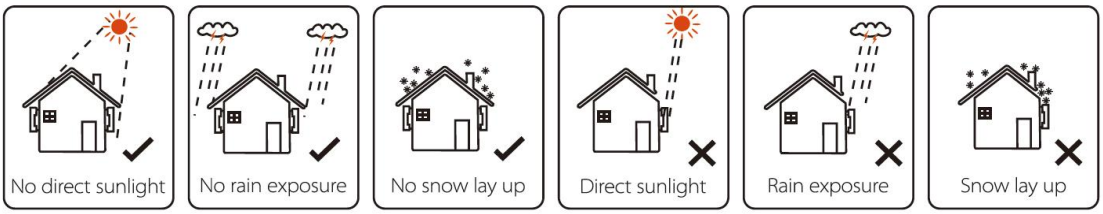
Installation Precaution

REVO Series inverter is designed for outdoor installation (IP 65). Make sure the installation site meets the following conditions:

- Not in direct sunlight.
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 2000m above sea level.
- Not in environment of precipitation or humidity (> 95%).
- Under good ventilation condition.
- The ambient temperature in the range of -20℃ to +60℃.
- The slope of the wall should be within ± 5°.
- The wall hanging the inverter should meet conditions below:

  1. solid brick/concrete, or strength equivalent mounting surface;
  2. Inverter must be supported or strengthened if the wall's strength isn't enough (such as wooden wall, the wall covered by thick layer of decoration)

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



Installation

Space Requirement

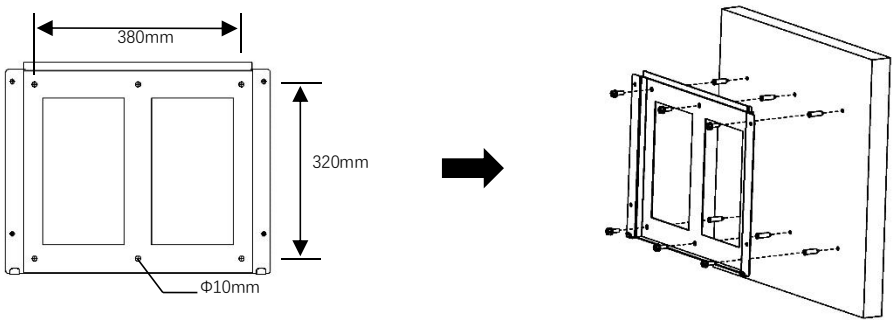
Position	Min size
Left	300mm
Right	300mm
Top	300mm
Bottom	300mm
Front	300mm

Mounting Steps

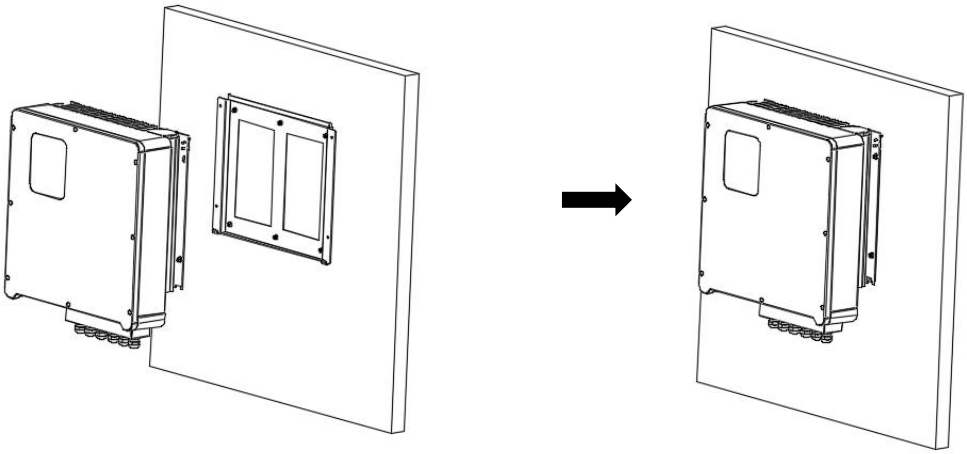
Tools required for installation.
Installation tools: crimping pliers for binding post and RJ 45, screwdriver, manual wrench etc.

Step 1: Screw the wall bracket on the wall
1.1 Place the bracket on the wall and mark down the position of the 4 holes.
1.2 Drill holes with driller, make sure the holes are deep enough (at least 60mm) to support the inverter.
1.3 Install the expansion tubes in the holes, and tighten them. Then install the wall bracket with the expansion screws.
Step 2: Place the inverter on the wall mounted bracket by holding the handle on the side.
Step 3: Tighten the fixing screws on both sides of the inverter.
Step 4: If necessary, customer can install an anti-theft lock on the left-bottom of the inverter.

Installation



Step1



Step2

6. Electrical Connection

6.1 PV connection

Revo Hybrid can be connected in series with 2-strings PV modules for 6KW,8KW,10KW, 12KW,15KW .

Select PV modules with excellent function and reliable quality. Open-circuit voltage of module arrays connected in series should be Less than Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.

Max. DC Voltage Limitation

Model	R6KH3 (R6KH3-P)	R8KH3 (R8KH3-P)	R10KH3 (R10KH3-P)	R12KH3 (R12KH3-P)	R15KH3 (R15KH3-P)
Max DC Voltage (V)	1000				
MPPT Voltage Range (V)	180~850				

Warning!

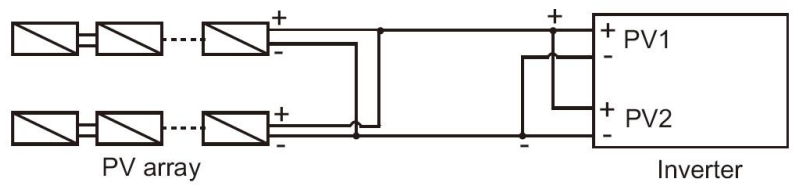
- PV module voltage is very high, which already achieve dangerous voltage range, please comply with electric safety rules when connecting.
- Please do not make PV positive or negative ground!

Note!

- The following requirements of PV modules need to be applied for each input area;
- Please do not make PV positive or negative ground!
- In order to save cable and reduce the DC loss, we suggest to install the inverter near PV modules.

Note!

PV connection mode below is NOT allowed!



Electrical Connection

Connection Steps:

Step1. Checking PV module.

1.1 Use voltmeter to measure module array voltage.

1.2 Check the PV+ and PV- from the PV string combiner box correctly.

1.3 Please make sure the impedance between the positive pole and negative pole of PV to earth should be MΩ level.

Step2. Separating the DC connector.

Step3. Wiring.

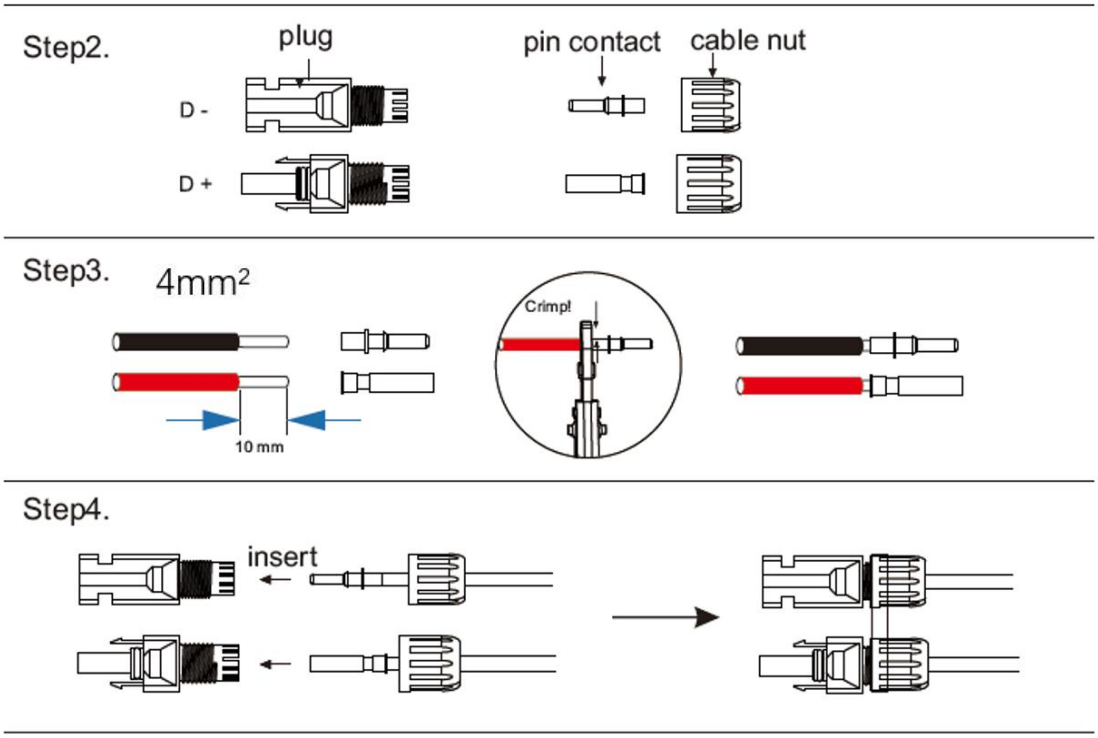
3.1 Choose the 4mm² wire to connect with the cold-pressed terminal.

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

3.3 Insert the insulation into pin contact and use crimping plier to clamp it.

Step4. Insert pin contact through the cable nut to assemble into back of the male or female plug. When you feel or heard a “click” sound the pin contact assembly is seated correctly.

Step5. Plug the PV connector into the corresponding PV connector on inverter



6.2 Grid Connection

Revo-Hybrid series inverter are designed for three-phase grid. Voltage is 380/400/415V, frequency is 50/60Hz. Other technical requests should comply with the requirement of the local public grid.

Table 4 Cable and Micro-breaker recommended

Model	R6KH3 (R6KH3-P)	R8KH3 (R8KH3-P)	R10KH3 (R10KH3-P)	R12KH3 (R12KH3-P)	R15KH3 (R15KH3-P)
Cable	4-6mm²			6-10mm²	
Micro-breaker	20A		32A		

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

Connection Steps:

Step1. Check the grid voltage.

1.1 Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).

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

Step2. Remove the waterproof lid from the grid port on the inverter.

Step3. Make AC wires.

3.1 Choose the appropriate wire (Cable size: refer to Table 4).

3.2 Reserve about 60mm of conductor material sectional area.

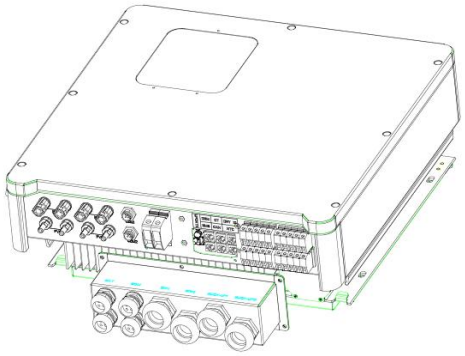
3.3 Remove 10mm of insulation from the end of wire.

3.4 Clamp down the terminals with crimping pliers

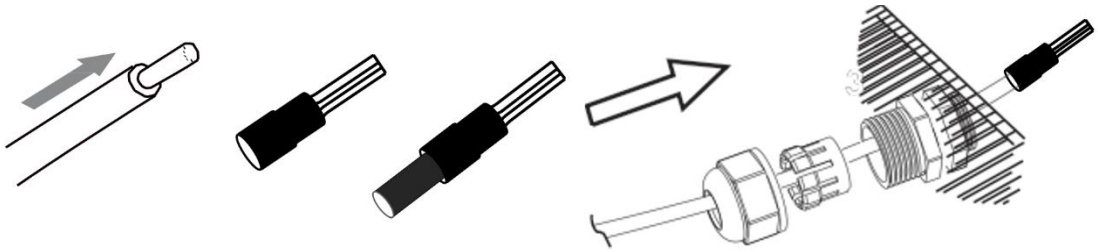
3.5 Disassembly of waterproof connectors and waterproof covers and pass the cable through the waterproof connector.

Step4. Connect the AC connector to the GRID port of the inverter with a slotted screwdriver

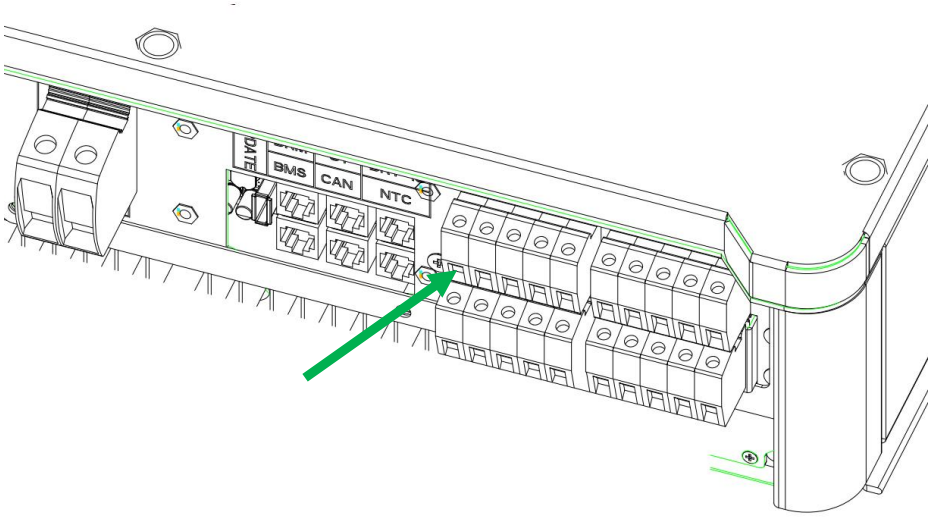
Step2



Step3



Step4



6.3 EPS connection (apply to I Version and E Version only)

REVO series inverter has on and off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through EPS port when the grid is off.

I Version & E Version

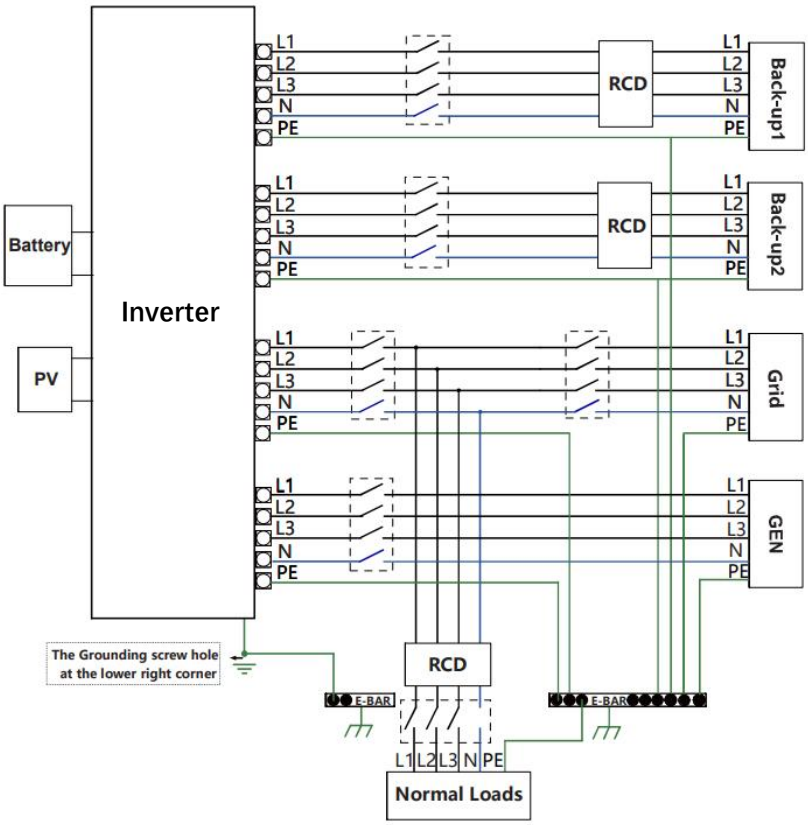
REVO series inverter provides two versions for customer to choose based on the local rules.
“I Version” means inverter has an build-in changeover switch. This version applies to the wiring rules which requires N (Neutral) line of alternative supply must not be isolated or switched. (applies to wiring rules AS/NZS3000:2014 of Australia and New Zealand.)
“E Version” means inverter needs to install an external changeover device for EPS function. This version applies to the wiring rules which allows N (Neutral) line of alternative supply can be isolated or switched. (applies to most of the countries).

Auto & Manual

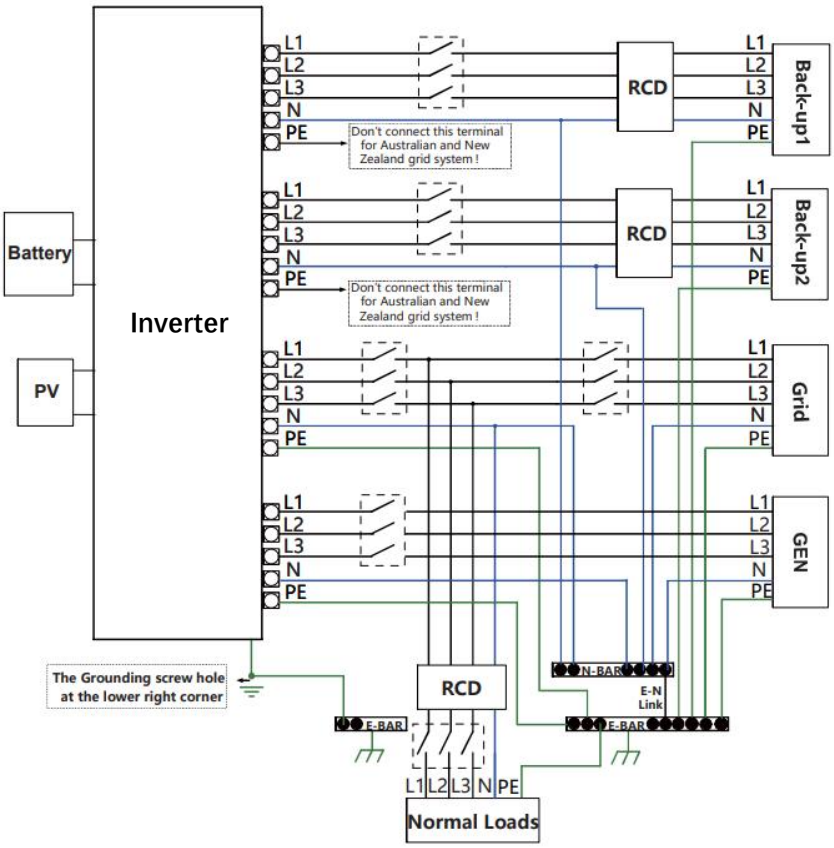
EPS function can be achieved automatically or manually according to user’s wishes. For “I Version” inverter, EPS function can only be triggered automatically.
For “E Version” inverter, EPS function can be triggered either automatically or manually according to user’s preference.
If user wants to use this function manually, it will need to be installed an external switch. Please refer to specific wiring diagram below.
For solution, please contact our sales.

Electrical Connection

E VersionAuto　　Required for Changeover Switch. synonymy：Back-UP/EPS/LOAD



I Version Auto　　Do not require for Changeover Switch. synonymy：Back-UP/EPS/LOAD



Electrical Connection

Please contact our sales for any compatible contactor purchase requirement

> Note!
>
> In case of discrepancies between wiring mode of local policy and the operation guide above, especially for the wiring of n (neutral) line, grounding and RCD, please contact us before any operation! The wiring diagram is for reference only, and the complete electrical connection shall meet the requirements of local regulations.

REVO Series hybrid inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through BACKUP port when the grid is off.

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

When there is a power outage or when there is no power grid

1) If the battery does not report low voltage or under voltage alarm, the inverter will supply power to both BACKUP1 and BACKUP2
2) If the battery generates a low voltage or under voltage alarm, the inverter only supplies power to BACKUP1

Table 5 Cable and Micro-breaker recommended

Model	R6KH3 (R6KH3-P)	R8KH3 (R8KH3-P)	R10KH3 (R10KH3-P)	R12KH3 (R12KH3-P)	R15KH3 (R15KH3-P)
Cable	4-6mm²			6-10mm²	
Micro-breaker	20A		32A		

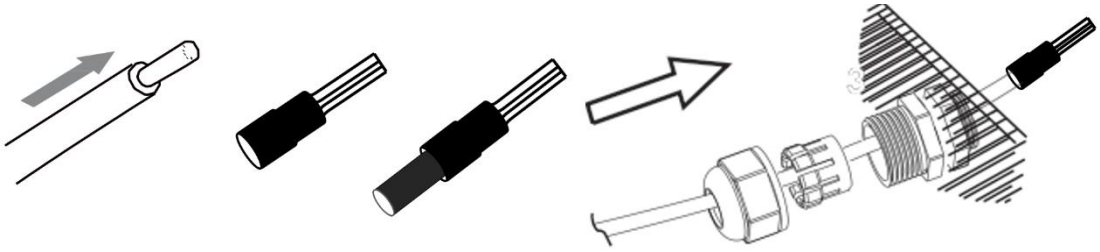
Connection Steps:

Step1.Make EPS wires

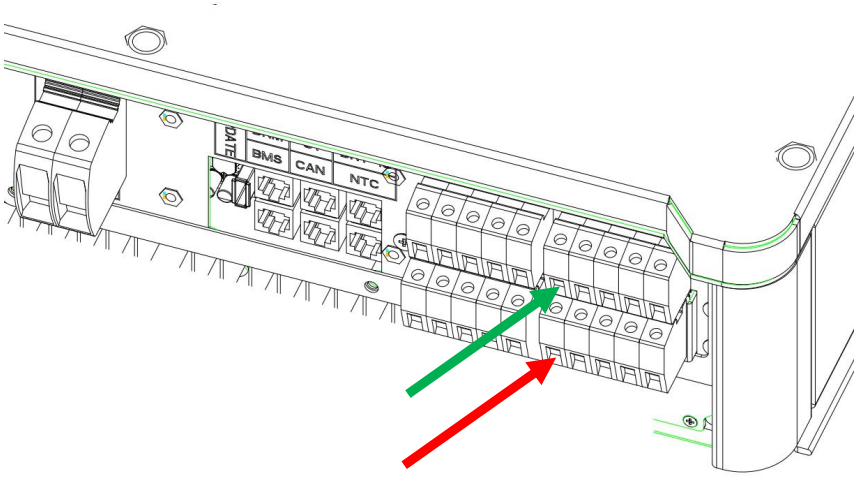
3.1 Choose the appropriate wire (cable size: refer to picture below).
3.2 Reserve about 60mm of conductor material sectional area.
3.3 Remove 10mm of insulation from the end of wire.
3.4 Clamp down the terminals with crimping pliers
3.5 Disassembly of waterproof connectors and waterproof covers and pass the cable through the waterproof connector.

Step2. Connect the AC connector to the EPS port of the inverter with a slotted screwdriver. The arrow (top) is backup1, The arrow (bottom) is backup2,

Step1



Step2



Requirements for EPS load

WARNING!

Make sure the EPS load power rating is within EPS output rating, otherwise the inverter will shut down with an "over load" warning.

When an "over load" is appeared, adjust the load power to make sure it is within the EPS output power range, then turn the inverter back on.

For the nonlinear load, please make sure the inrush power should be within the EPS output power range.

Below table shows some common feasible loads for you reference.

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

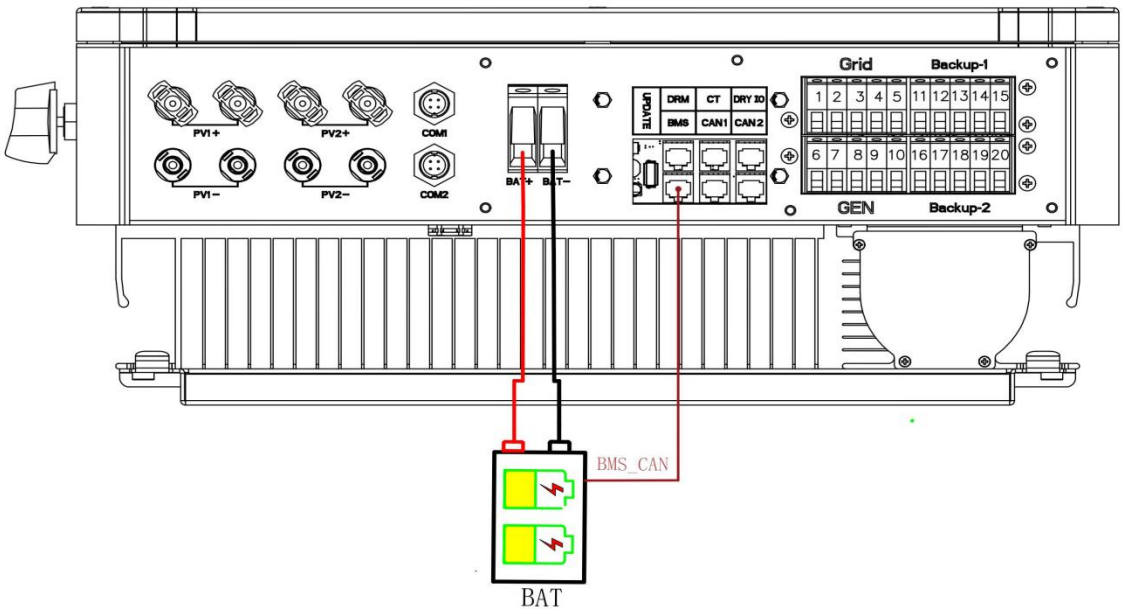
6.4 Battery Connection

Charging & discharging system of Revo Hybrid series inverter is designed for high-voltage lithium battery.
Before choosing battery, please note the battery communication should be compatible with Revo Hybrid inverter

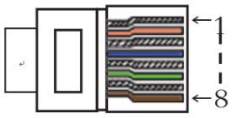
Battery breaker
Before connecting to battery, please install a nonpolar DC breaker to make sure inverter can be securely disconnected during maintenance

Model	R6KH3 (R6KH3-P)	R8KH3 (R8KH3-P)	R10KH3 (R10KH3-P)	R12KH3 (R12KH3-P)	R15KH3 (R6KH3-P)
Voltage	Nominal voltage of DC breaker should be larger than maximum voltage of battery				
Current(A)	63A				

Battery connection diagram



BMS PIN Defination
Communication interface between inverter and battery is RS485 or CAN with a RJ45 connector



PIN	1	2	3	4	5	6	7	8
BMS	RS485_ WIFIA	RS485_ WIFIB	CANB_H	CAN_BMS_H	CAN_BMS_L	CANB_L	RS485_ BMSA	RS485_ BMSB

Electrical Connection

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

> Note!
> The battery communication can only work when the battery BMS is compatible with the inverter.

Power Connection Steps:

Step123. Choose the 10mm^2 wire and strip the cable to 15mm.

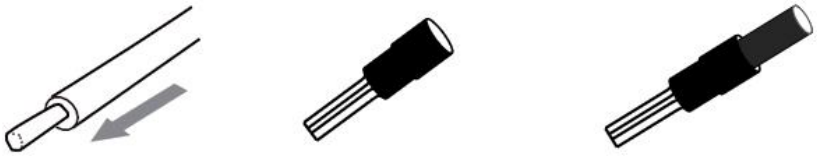
Step4. Remove waterproof cover plate.

Step5. Disassemble the waterproof connector and pass the cable through the waterproof connector.

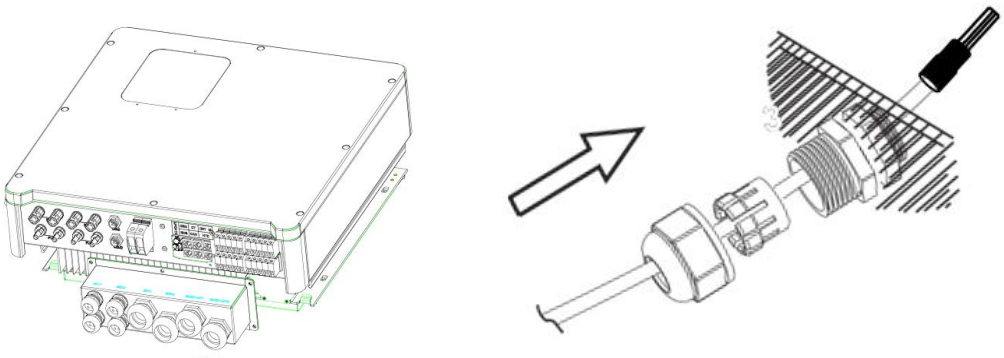
Step6. Connect the cable to the terminal of the inverter.

Step6. Assemble waterproof connectors and waterproof covers plate.

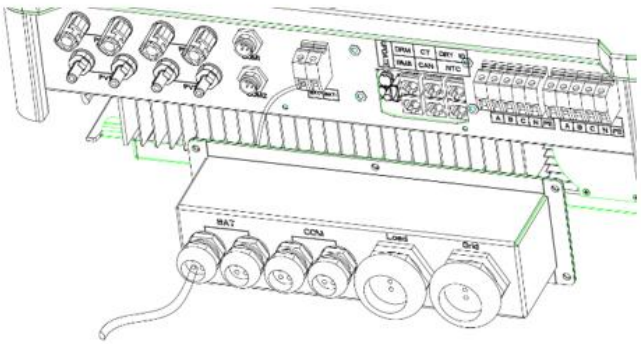
Step1,2,3



Step 4, 5



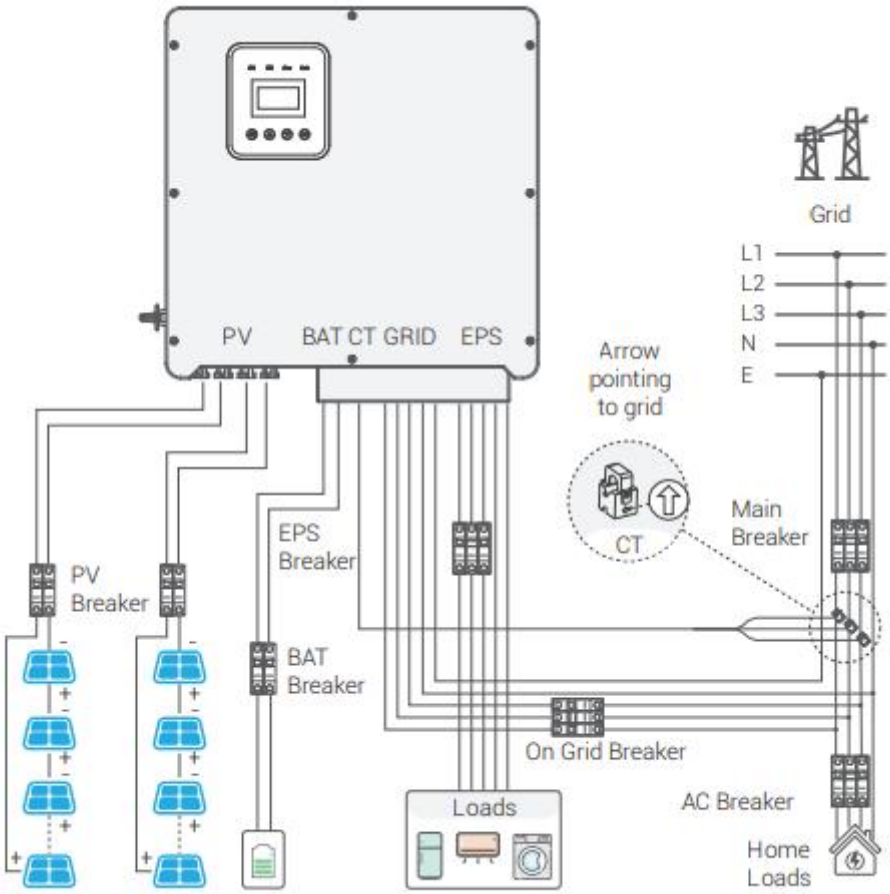
Step 6



6.5 CT Connection and Phase instruction

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

CT connection and phase wiring diagram



Note!

The CT arrow points to the power grid, otherwise the inverter display data will be wrong or the machine can't be used normally.

Do not misconnect the CT phase sequence. Otherwise, the inverter cannot run normally.

The yellow, green and red sequences of CT correspond to L1, L2 and L3 of the power grid respectively.

Electrical Connection

CT Connection Steps:

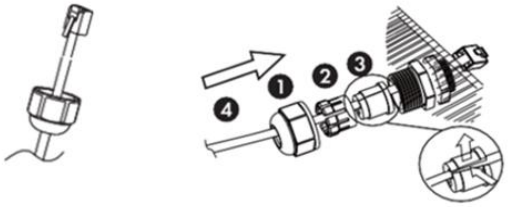
Step1. Disassembly of waterproof connectors and waterproof covers.

Step2. Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step3. Insert CT line side of the cable into CT port inside of inverter

Step4. Assemble waterproof connectors and waterproof covers plate.

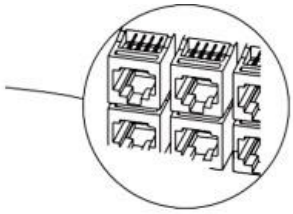
Step1.2



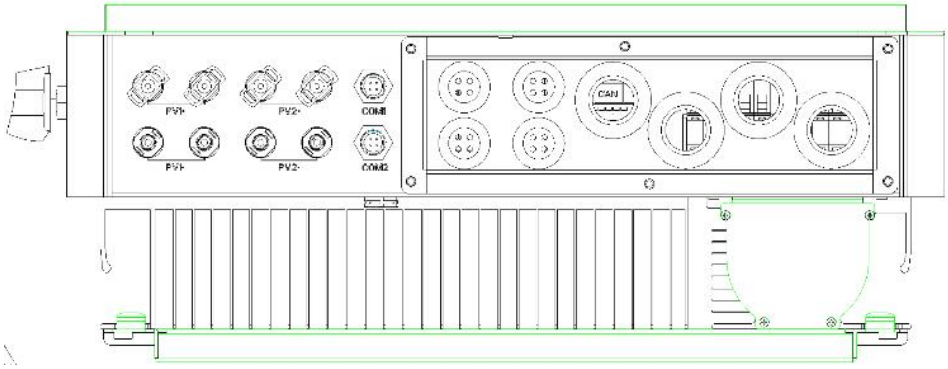
The seal is used for waterproof.Please make sure it has been kept back.

Step3

DRM	CT	DRY IO
BMS-CAN	CAN1	CAN2



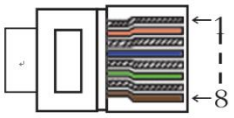
Step4



6.6 DRM Connection (Function temporarily retained)

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

Note: Only PIN6(DRM0) is available now, and other PIN functions are being developed

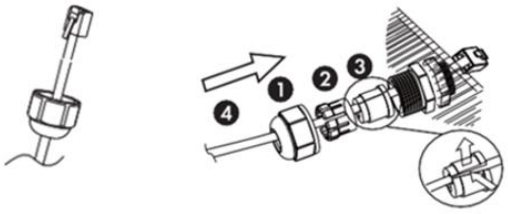


1	2	3	4	5	6	7	8
DRM1/5	DRM2/6	DRM3/7	DRM4/8	+5V	DRM0	GND	GND

DRM Connection Steps:

Please refer to CT connection steps for DRM connection. Please kindly noted the PIN definition and port position will be slightly different.

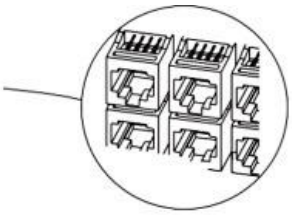
Step1,2



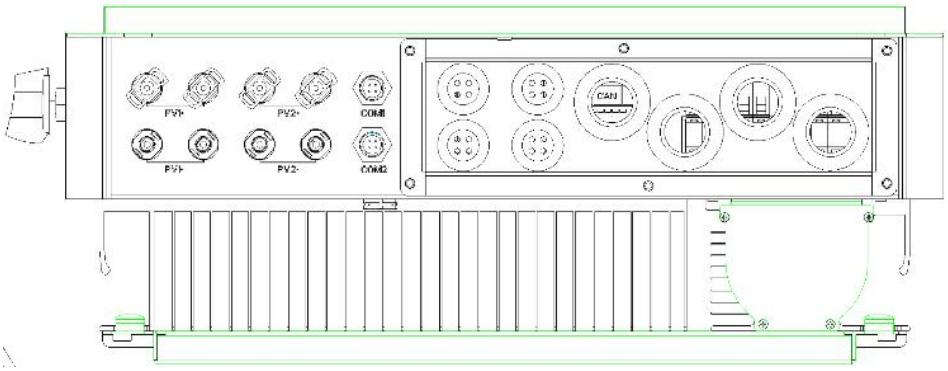
The seal is used for waterproof.Please make sure it has been kept back.

Step3

DRM	CT	DRY IO
BMS-CAN	CAN1	CAN2



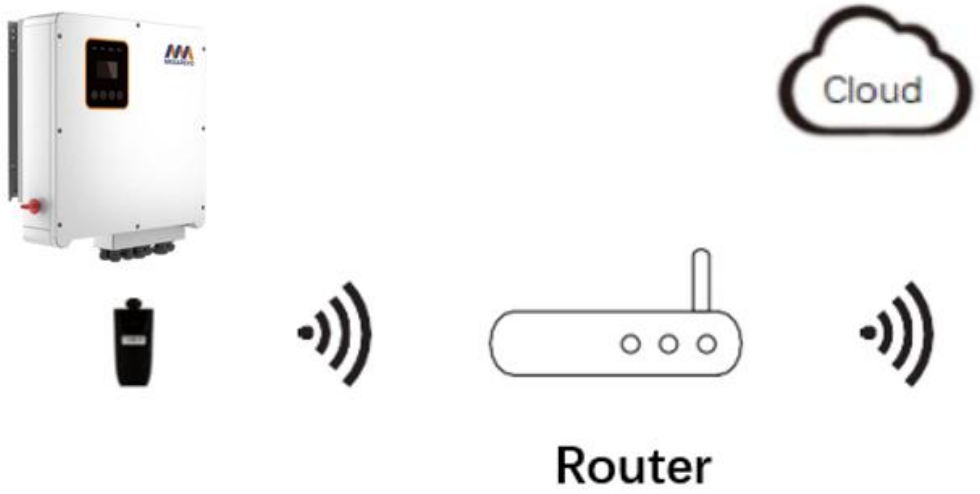
Step4



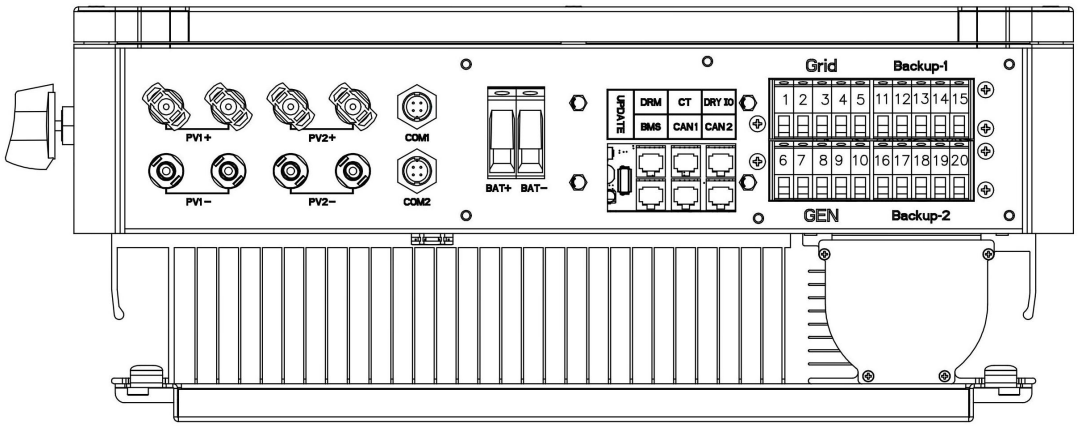
6.7 WiFi Connection(optional)

Inverter provides a WIFI port which can collect data from inverter and transmit it to monitoring-website by WIFI.
(Purchase the product from supplier if needed)

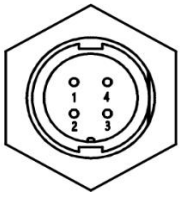
Diagram



WIFI Connection Steps:
Step1. Plug WIFI into COM2(WIFI) port at the bottom of the inverter.
Step2. Build the connection between the inverter and router.
Step3. Create a user account online. (Please check the WIFI user manual for more details).



COM

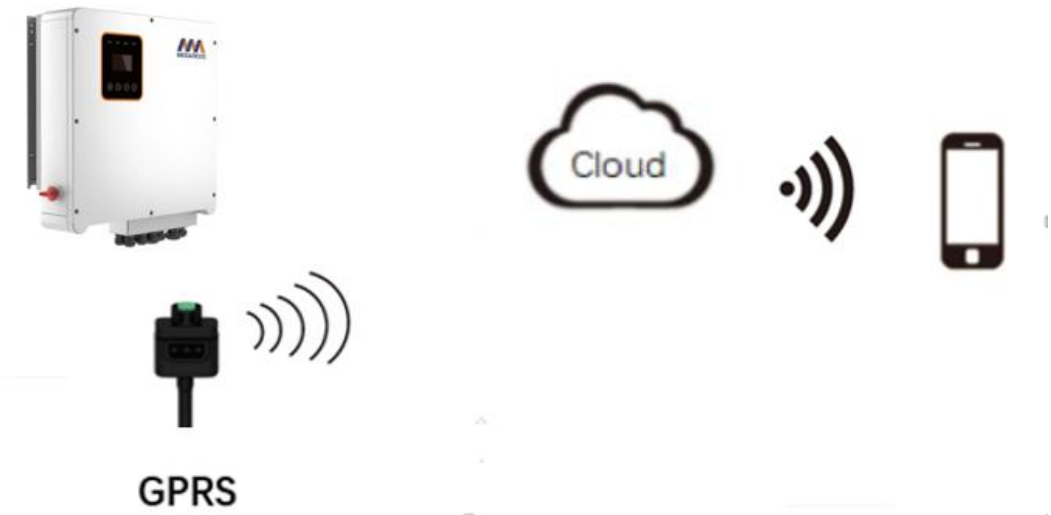


1	2	3	4
+5V	RS485_A	RS485_B	GND

6.8 GPRS Connection(optional)

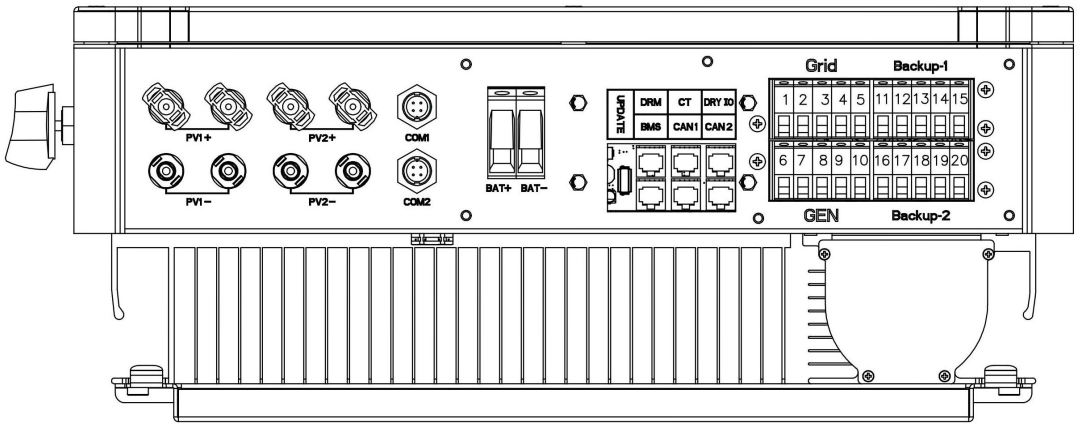
Revo Hybrid inverter provides a GPRS(radio frequency) interface which control the switch time of a designated load via an Smart Plug (purchase the product from supplier if needed.) so that the load mostly consumes PV energy and incurs the lowest-possible energy costs during operation.

Diagram

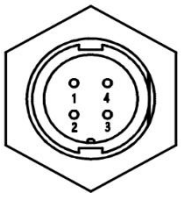


GPRS Connection Steps:

Please refer to the Smart Plug user manual for detailed connection steps. Com2 is GPRS port.



COM



1	2	3	4
+5V	RS485_A	RS485_B	GND

6.9 Inverter Manipulation

Start inverter after checking all below Steps:

- Ensure the inverter fixed well on the wall.
- Make sure all the DC wiring and AC wiring are completed.
- Make sure the meter/CT is connected well.
- Make sure the battery is connected well.
- Make sure the external BACKUP contactor is connected well.
- (if needed) Turn on the AC switch and EPS switch.
- Turn on the PV/DC switch and battery switch.

Check the inverter:

Step1. Check the status of indicators and LCD screen. the indicator screen should display the main interface

> Note!
> If the left indicator is not Green please check below the three points:
> - All the connections are correct.
> - All the external breakers are switched on.
> - The DC switch on the inverter is in the "ON" position.

Step2. If it is the first time to start up ,please follow it. For specific setting ,refer to section 8.2 (Setting).

Step3. Set wifi according to wifi user manual.

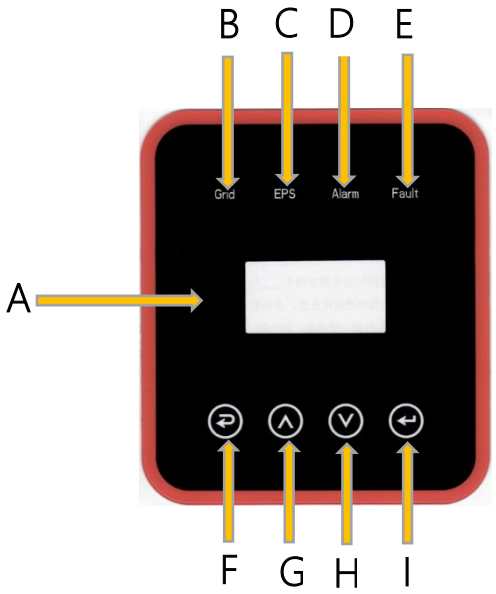
Step4. Operate "SelfTest". (applies to Italy only)

Self-test in accordance with CEI 0-21(applies to Italy only)

The self-test is only required for inverters, which are commissioned in Italy. The Italian standard requires that all inverters feeding into the utility grid are equipped with a self-test function in accordance with CEI 0-21. During the self-test, the inverter will consecutively check the protection reaction times and values for overvoltage, undervoltage, over frequency and underfrequency.

7. Setting

7.1 Control panel

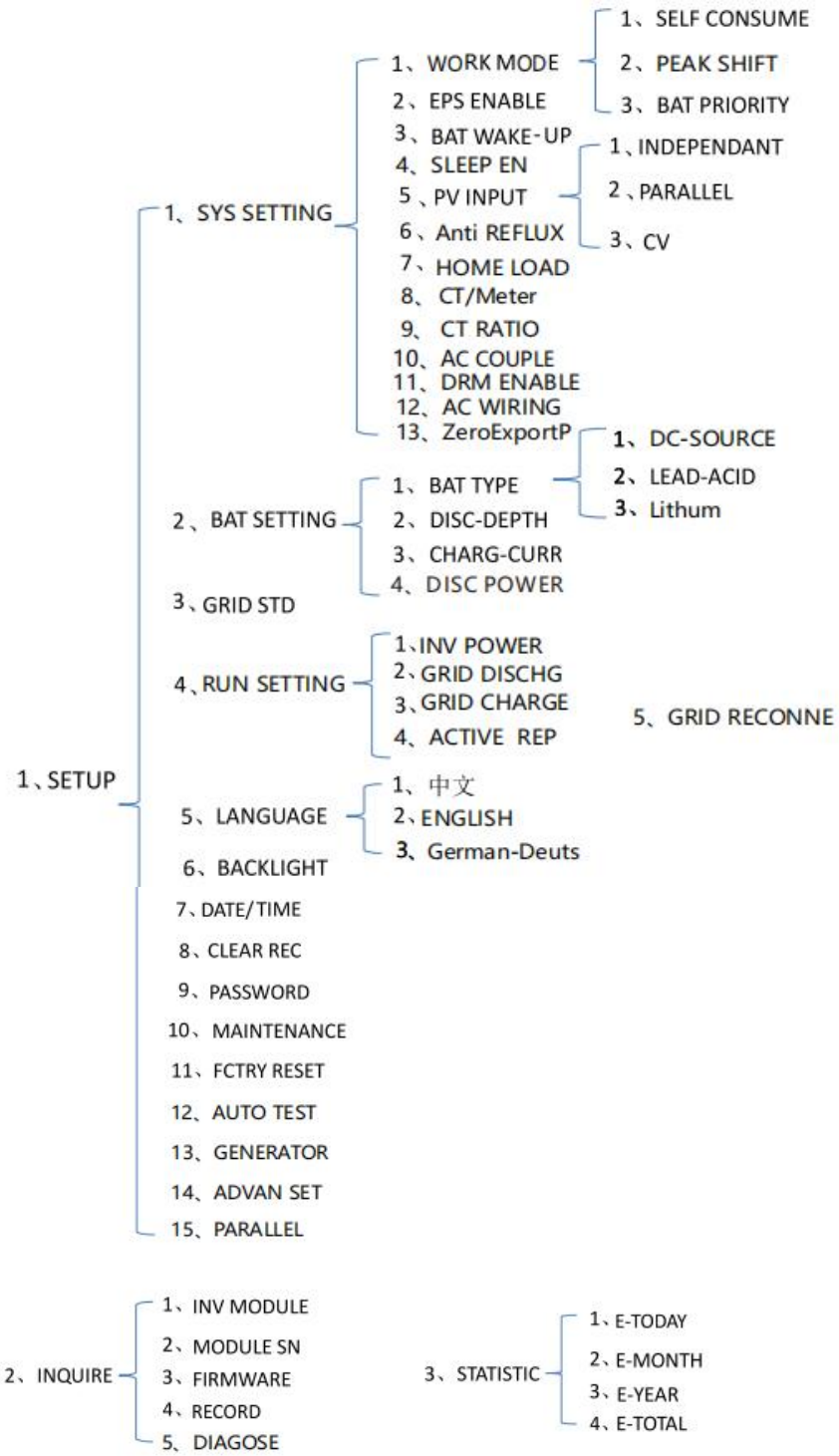


Object	Name	Description
A	LCD Screen	Display the information of the inverter.
B	Indicator LED	lit in green: The inverter is in grid mode. Off: The inverter is in not in grid mode.
C		lit in green: The inverter is in off-grid mode. Off: The inverter is in not in off-grid mode.
D		lit in Yellow: The inverter is in Warning . Off: The inverter has no Inverter Warning
E		lit in red: The inverter is in fault status. Off: The inverter has no errors.
F	Function Button	Esc: Return from current interface or function.
G		Up: Move cursor to upside or increase value.
H		Down: Move cursor to downside or decrease value.
I		Enter: Confirm the selection.

7.2 Instructions for LED indicator

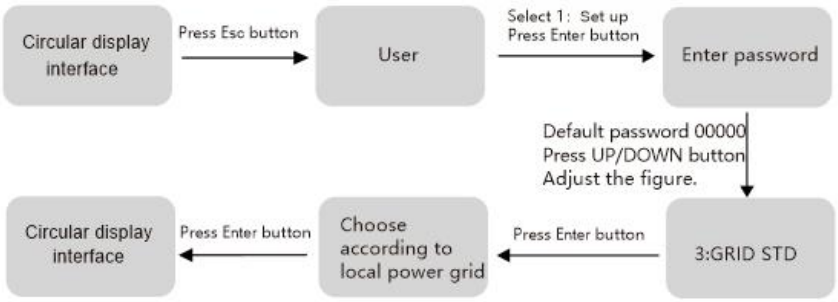
	Grid (Green)	EPS (Green)	Alarm (Yellow)	Fault (Red)
Initialization	off	off	off	off
Stand-by	off	off	off	off
Grid mode	on	/	/	/
Off-Grid	off	on	off	off
Bypass of mains	off	on	on	off
Fault	off	off	off	on

7.3 Instructions for the use of three modes

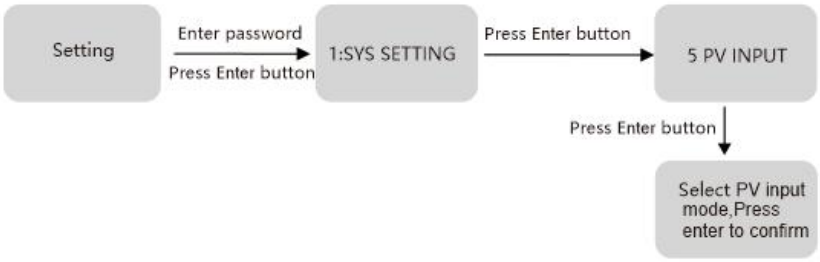


For example,Before selecting the mode, you can set it up ac cording to the local power grid, PV input mode and battery type.

Power grid:



PVinput mode:



Battery parameters:

8. LCD operation

8.1 LCD Interface

8.1.1 Error information

Interface	Description
EVENTS NO. 02:BatDisconnect 27:BMS Comm fail	Numbers represent error codes and text is events information. Refer to Chapter 9 for contents. NOTE: When there is a lock mark in the upper right corner of the screen, you cannot turn the page, you need to press Enter to unlock it first.

8.1.2 System setting1

Interface	Description
SYSTEM1 STATE: SELF CSM GRID STD : CN PV I/P: PARALL	State: Setting of the whole inverter working mode. Including: SELF CONSUME, PEAK SHIFT and BAT PRIORITY. Refer to Chapter 3.2 for specific contents. Grid standard: Displays the grid standard actually set. PV input mode: The display value is the setting value of PV input type. Including: INDEPENDANT, PARALLEL, CV. Settings and explanations are provided in section 8.2.4.5.

8.1.3 System setting2

Interface	Description
SYSTEM2 BMS Com: CAN AntiReflux: DISA DOD: 80%	BMS Com: Battery Management System communication mode. Including: CAN. Anti-Reverse :Displays Whether Inverter isn't allowed to generate electricity to the Grid. Including: DISABLE,ENABLE The Settings are described in section 8.2.4.6. DOD: Depth of battery discharge. When the battery discharge exceeds the DOD parameter, the inverter generates a low voltage or under voltage alarm, and the battery stops discharging.

8.1.4 System setting3

Interface	Description
SYSTEM3 EPS ENABLE: ENAB CT/Meter: CT	EPS ENABLE: When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

8.1.5 PV1 Input display interface

Interface	Description
PV1 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV1 input real-time voltage PV1 input real-time current PV1 input real-time power.

8.1.6 PV2 Input display interface

Interface	Description
PV2 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV2 input real-time voltage PV2 input real-time current PV2 input real-time power.

8.1.7 DC Voltage interface

Interface	Description
DC VOLTAGE BUS+: 0.0V BUS-: 0.0V	BUS+: Real-time voltage of bus capacitor of the inverter. BUS-: Real-time voltage of bus capacitor of the inverter.

8.1.8 Battery interface

Interface	Description
BATTERY VOLT: 0.0V CURR: 0.0A STA: C D F	Battery real-time voltage Battery real-time current STA: Battery status C : Indicates that the battery is rechargeable (From the BMS) D : Indicates that the battery can discharge (From the BMS) F : The battery requests a forcible charge (From the BMS)

8.1.9 Battery information interface

Interface	Description
BATTERY INFO TYPE: Lithum TEMP: 26℃ SOC: 30%	TYPE: Battery type:(lead-acid, lithium battery) TEMP: Battery temperature. SOC: Percentage of battery capacity from the BMS

8.1.10 Battery current interface

Interface	Description
BMS PRMETER CHAR VOL: 0.0V CHARGE: 0A DISCHA: 0A	CHAR VOL: Battery BMS request Max. charging voltage. CHARGE: Battery BMS request Max. charging current. DISCHA: Battery BMS request Max. discharging current.

8.1.11 Grid-connected

Interface	Description
GRID: 0.00Hz U:0.0V 0.0A V:0.0V 0.0A W: 0.0V 0.0A	GRID FREQ: Grid real-time frequency. U: Gird-phase U real-time voltage. CT real-time current V: Gird-phase V real-time voltage. CT real-time current W: Gird-phase W real-time voltage. CT real-time current CT: Current sensor accessories

8.1.12 GEN

Interface	Description
GEN: 0.00Hz U:0.0V 0.0A V:0.0V 0.0A W: 0.0V 0.0A	GEN FREQ: GEN real-time frequency. U: GEN-phase U real-time voltage. GEN-phase U real-time current V: GEN-phase V real-time voltage. GEN-phase V real-time current. W: GEN-phase W real-time voltage. GEN-phase W real-time current.

8.1.13 INV

Interface	Description
INV: 0.00Hz U: 0.0V 0.0A V: 0.0V 0.0A W:0.0V 0.0A	INV FREQ: Grid real-time frequency. U: INV -phase U real-time voltage. INV -phase U real-time current. V:INV -phase V real-time voltage. INV -phase V real-time current. W: INV -phase W real-time voltage. INV -phase W real-time current.

8.1.14 LOAD

Interface	Description
LOAD U: 0.0V 0.0A V: 0.0V 0.0A W:0.0V 0.0A	synonymy: Back-UP/EPS/LOAD U: Load-phase U real-time voltage. Load-phase U real-time current. V: Load -phase V real-time voltage. Load-phase V real-time current. W: Load -phase W real-time voltage. Load-phase W real-time current.

8.1.15 INV POWER

Interface	Description
POWER INV U : 0.0W INV V : 0.0W INV W : 0.0W	INV: INV -phase U power. INV: INV -phase V power. INV: INV -phase W power

8.1.16 GRID POWER

Interface	Description
POWER GRID U : 0.0W GRID V : 0.0W GRIDW : 0.0W	The CT arrow points to the power grid. The discharge from the inverter to the grid is "+", and the opposite is "-". GRID: GRID -phase U power. GRID: GRID -phase V power. GRID: GRID -phase W power.

8.1.17 GEN POWER

Interface	Description
POWER GEN U : 0.0W GEN V : 0.0W GEN W : 0.0W	GEN: GEN -phase U power. GEN: GEN -phase V power. GEN: GEN -phase W power.

8.1.18 EPS LOAD POWER

Interface	Description
EPS LOAD POWER U: 0W 0% V: 0W 0% W : 0W 0%	U : Load-phase U power percentage. V : Load-phase V power percentage. W: Load-phase W power percentage.

8.1.19 POWER

Interface	Description
POWER PV: 0W BAT: 0W HOMELOAD： 0W	PV: PV power. BAT: Battery power. HOMELOAD： External load power

8.1.20 Temperature

Interface	Description
TEMPERATURE INVER: 0℃ DCDC: 0℃ INSIDE: 0℃	INVER: DC/AC temperature. DCDC: DC/DC temperature. INSIDE: Internal ambient temperature.

8.1.21 State

Interface	Description
STATE SYS: STANDBY INV: STANDBY DCDC: STANDBY	System information: Display complete inverter status information, Including: Initialization, Standby, PV grid connection, Grid connection of battery, Hybrid power supply, Fault, Service ,Self -check, Off gird, grid, INV to PFC , Charging enable, Discharge enable, Force charge enable, etc. INV: Displays the inverter status information. DCDC: Displays charging and discharging status information

8.2 Setting

8.2.1 State

Interface	Description
USER →1:SETUP 2:INQUIRE 3:STATISTIC	SETUP: Press Enter to user settings interface. INQUIRE: Query inverter model, serial number, software version. STATISTIC: View inverter run statistics.

8.2.2 SET Password

Interface	Description
PASSWORD INPUT: XXXXX	Enter the password required for setting. The default password is“00000”. Press the Up or Down keys to adjust the number, press the Enter key to move the cursor forward, and press the Esc key move the cursor backward.

8.2.3 Setup

Interface	Description
SETUP →1:SYS SETTING 2:BAT SETTING 3:GRID STD 4:RUN SETTING 5:LANGUAGE 6:BACKLIGHT 7:DATE/TIME 8:CLEAR REC 9:PASSWORD 10:MAINTENANCE 11:FCTRY RESET 12:AUTO TEST 13:GENERATOR 14:ADVAN SET 15:PARALLEL	This interface is used for various information inquiry options. Press the Up/Down button to make the corresponding selection. Press Enter button to enter the selected menu. Press ESC button return to the user interface. (Refer to 8.2.1). There are 15 options in total.

8.2.4 System setting

8.2.4.0 System setting

Interface	Description
SYS SETTING →1: WORK MODE 2: EPS ENABLE 3: BAT WAKE-UP 4: SLEEP EN 5: PV INPUT 6: Anti REFLUX 7: HOME LOAD 8:CT/Meter 9:CTRATIO 10:AC COUPLE 11:DRM ENABLE 12:AC WIRING 13:ZeroExportP	This interface is used to access system information. Press Up/Down button to move corresponding options. Press Enter to enter the selected menu. Press ESC button to return to the setting interface. There are 13 options in total.

8.2.4.1 Work mode

Interface	Description
WORK MODE →1:SELFCONSUME 2:PEAK SHIFT 3:BAT PRIORITY	This interface is used to select the working mode. Press ESC button return to setting interface. (Refer to 3.2)

8.2.4.1.1 Peak shift work time

Interface	Description
WORK MODE 1:SELFCONSUME →2:PEAK SHIFT 3:BAT PRIORITY	This interface is used to select the working mode. Press ESC button return to setting interface. (Refer to 3.2). Select the peak shift mode, you also need to set the charge and discharge time
WORKTIME →1:TIME 1 2:TIME 2 3:TIME 3	It's allowed to set Three charging and discharging periods. When setting the time, ensure that the time of the inverter is the local time. Press Enter to enter the next menu.
CHAG START1 00:00 CHARGE END100:02 DISC START1 00:03 DISCHA END1 23:59	This parameter is set for one day. If the specified time conflicts, the first time is used as the main time perform. If the three time ranges do not conflict, the three time ranges are executed in sequence. This interface is used to adjust the time of peak load shifting. Press Up/Down button to move the corresponding options. Press Enter to enter the selected menu. Press Esc button to return to the working mode interface.

8.2.4.2 EPS enable

Interface	Description
EPS ENABLE 1:DISABLE →2:ENABLE	When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

8.2.4.3 Battery wake-up

Interface	Description
WAKE-UP EN →1:DISABLE 2:ENABLE	When the battery is low and the battery relay has been disconnected, the inverter will send instructions to the battery forcibly sucking relay by BMS, and the inverter will charge. The default option is disabled. (Partial lithium battery support) If you want to use this feature, please consult the battery brand supported by the dealer. Use it only when the battery is too low.

8.2.4.4 SLEEP EN

Interface	Description
SLEEP EN 1:DISABLE →2:ENABLE	Sleep enablement allows

8.2.4.5 PV INPUT

Interface	Description
INPUT MODE → 1:INDEPENDANT 2:PARALLEL 3:CV	Setup of PV Input mode. INDEPENDENT: The default Settings PARALLEL: This feature is for test use only, not customer use. CV: This feature is for test use only, not customer use. The factory setting by default is Independent, When parallel input is set to be Independent mode, PV power will be imbalanced.

8.2.4.6 Anti REFLUX

Interface	Description
Anti Reflux →1.DISABLE 2.ENABLE	Anti- Reverse: Whether Inverter isn't allowed to generate electricity to the Grid. The default option is disable.

8.2.4.7 HOME LOAD

Interface	Description
HOME LOAD 1.DISABLE →2.ENABLE	When set to "ENABLE", if you have a load connected to the mains port, you can see its load power.

8.2.4.8 CT/Meter

Interface	Description
CT/Meter →1.CT 2.GHINT 3:Acerl	Manually select whether to use CT or electricity meters.

8.2.4.9 CT RATIO

Interface	Description
CT/Ratio INPUT:01000:1	CT proportional parameters. Depending on the actual CT ratio parameter, the factory default is 1000:1.

8.2.4.10 AC COUPLE

Interface	Description
AC Couple →1.DISABLE 2.ENABLE	Manually select whether AC coupling is enabled.

8.2.4.11 DRM ENABLE

Interface	Description
DRM ENABLE →1.DISABLE 2.ENABLE	Manually select whether DRM is enabled or not.

8.2.4.12 AC WIRING

Interface	Description
AC WIRING →1.TN-S 2.TN-C	Manually select the wiring method TN-S: TN-S stands for three-phase five-wire TN-C: TN-C stands for three-phase four-wire

8.2.4.13 ZeroExportP

Interface	Description
ZeroExprotPower INPUT:+000W	ZeroExpower:If the sampling error occurs when there is no power in the grid, the user can set the corresponding value to correct it.

8.2.5 BAT SETTING

8.2.5.0 BAT SETTING

Interface	Description
BAT SETTING →1.BAT TYPE 2.DISC-DEPTH 3.CHARG-CURR	This interface is used to select battery parameters. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu; Press ESC button to return to setting interface.

8.2.5.1 BAT TYPE

Interface	Description
BAT TYPE →1.DC-SOURCE 2.LEAD-ACID 3.Lithum	This item is used for internal testing in R&D

8.2.5.2 BAT TYPE

Interface	Description
BAT TYPE 1.DC-SOURCE →2.LEAD-ACID 3.Lithum	This interface is used to select battery type. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. Select the LEAD-ACID enter button to enter LEAD-ACID interface; Set 1 to test and disable the setting.

8.2.5.2.1 Lead-acid battery parameter

Interface	Description
LEAD-ACID →1.CHARG-VOLT 2:CV Charge V 3.BAT END VOLT 4:BAT OVP 5:BAT CAP	This interface is used to select LEAD-ACID battery parameter. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu; 1. Charge voltage 3. BAT end voltage 4. BAT over voltage
CHARGE VOLT INPUT: 135.0 UNIT: V	This interface is used to set the lead acid battery charging voltage. (The input value ranges from 135 to 600)
Absorption INPUT: 110 UNIT: V	This interface is used to set the constant voltage charging voltage. (Input values range from 110 to 499)
BAT END VOLT INPUT: 108.0 UNIT: V	This interface is used to set the lead acid battery Charge protection voltage. (The input value ranges from 141 to 600) Charge protection voltage, as recommended by the battery manufacturer.
BAT OVP INPUT: 141.0 UNIT: V	This interface is used to set the lead acid Battery capacity. It is related to the input power. (The input value ranges from 50 to 1000)
BAT CAP INPUT: 0100 UNIT: AH	The battery capacity setting will affect the maximum charging current, for example, set 100Ah, the maximum charging current is 100A*0.2=20A

8.2.5.3 BAT TYPE

Interface	Description
BAT TYPE 1.DC-SOURCE 2.LEAD-ACID →3.Lithum	Lithium batteries have a voltage range of 125V to 600V

8.2.6 Grid standard

8.2.6.1 Grid standard

Interface	Description
GRID STD 1.AU 2.AU-W 3.NZ 4.UK 5.PK 6.KR 7.PHI 8.CN → 9.US-CA 10.THAIL 11.ZA 12.CUSTOM 13.POL 14.EN50549 15.GER-VDE41 05 16.JPN 17.ITA 18.SLO 19.CZE 20.SWE 21.HU 22.SK 23.AT 24.BE 25:JM 26:IE 27:KW 28:ROU 29:FR 30:NL 31:CH 32:ES	This interface is used to select Grid standard. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. 1:AU-Australia: 240V/415V/50Hz 2:AU-W(Western Australia): 240V/415V/50Hz 3:NZ- New Zealand : 240V/415V /50Hz 4:UK-United Kingdom 230V/50HZ 5:PK- Pakistan 230V/50HZ 6:KR-Korea: 220V/380V/60Hz 7:PHI-Philippines: 220V/60HZ 8:CN-China: 220V/380V/50HZ 9:US-CA—America: 120V/240V 208V/240V/60Hz 10:THAIL 220/380V/50HZ 11:ZA 230/50HZ 12:CUSTOM-User defined 13:POL 230V/380V/50HZ 14:EN50549 217V/220V/240V 380V/400V 50HZ/60HZ 15:VDE4105—Germany: 230V/380V/50Hz 16: JPN- Japan 100V/200V/50Hz 17: ITA- Italy 127V/220V/50Hz 18: SLO- Slovenia 230V/380V/50Hz 19: CZE- Czech Republic 230V/380V/50Hz 20: SWE- Sweden 230V/380V/50Hz 21: HU- Hungary 230V/380V/50Hz 22: SK- Slovakia 230V/380V/50Hz 23: AT- Austria 230V/380V/50Hz 24: BE- Belgium 230V/380V/50Hz 25: JM-Jamaica (retain) 26: IE-Ireland 217V/220V/240V 380V/400V 50HZ/60HZ 27: KW-Kuwait 217V/220V/240V 380V/400V 50HZ/60HZ 28: ROU-Romanian 217V/220V/240V 380V/400V 50HZ/60HZ 29: FR-France 230V/400V/50HZ 30: NL-Netherlands 230V/400V/50HZ 31: CH-Switzerland 230V/400V/50HZ 32: ES-Spain 230V/400V/50HZ If the country used is not one of the above options, consult the distributor.

8.2.7 RUN SETTING

8.2.7.0 RUN SETTING

Interface	Description
RUN SETTING →1.Inverter power 2.GRID DISCHG 3.GRID CHARGE. 4.ACTIVE REP 5:GRID RECONNE	This interface is used to select run setting. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. Factory default Settings. Please consult the distributor for modification
Inverter power INPUT: 100%	The maximum inverter power is 100%
GRID DISC PER INPUT:09000w	The discharge power can be set according to the actual situation
GRID CHG PER INPUT:1800W	The charging power can be set according to the actual situation

8.2.7.1 ACTIVE REP.

Interface	Description
ACTIVE Type →1:Anti-Island 2:Leack Curren 3:Insul detect	This interface is used to select run setting. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. Factory default Settings. Please consult the distributor for modification.
Anti-Islanding 1.DISABLE →2.ENABLE	Anti-Island enable.
Leakcurrdetect 1. DISABLE →2. ENABLE	Leak Current Detection enable
InsulationDetect 1. DISABLE → 2. ENABLE	Manually select whether insulation detection is enabled

8.2.7.2 GRID RECONNE

Interface	Description
GRID RECONNECT T INPUT: 100 s	Grid reconnection time, according to each country-specific standard

8.2.8 LANGUAGE

8.2.8.0 LANGUAGE

Interface	Description
LANGUAGE 1.Chinese →2.English 3:German-Deuts	This interface is used to select language.

8.2.9 BACKLIGHT

8.2.9.0 BACKLIGHT

Interface	Description
LIGHT TIME INPUT: 20 UNIT: SEC	This screen is used to set the screen light time.

8.2.10 DATE/TIME

8.2.10.0 DATE/TIME

Interface	Description
DATE/TIME DATE: 2021-12-25 TIME: 22:30:00 WEEK: Saturday	This interface is used to set date and time.

8.2.11 CLEAR REC

8.2.11.0 Clear history

Interface	Description
DEL REC →1.CANCEL 2.CONFIRM	This interface is used to clear operation history.

8.2.12 PASSWORD

8.2.12.0 PASSWORD

Interface	Description
PASSWORD OLD: XXXXX NEW: XXXXX CONFIRM: XXXXX	This interface is used to set password.

8.2.13 MAINTENANCE

8.2.13.0 MAINTENANCE

Interface	Description
PASSWORD INPUT: XXXXX	This interface is used to enter maintenance. The default password is 99999.

8.2.14 FCTRY RESET

8.2.14.0 FACTORY RESET

Interface	Description
FACTORY RESET →1.CANCEL 2.CONFIRM	This interface is used to reset the inverter.

8.2.15 AUTO TEST

Interface	Description
59.S1 Testing... Set: 253.0V Set: 3000ms	Italian safety self-test function

8.2.16 Generator Setting

The Generator setting page can be visited in the following steps in the screen:
USER->1. SETUP->15.Generator

8.2.16.1 Setting

Interface	Description
Generator. →1.CONTROL 2.START SOC 3. STOP SOC 4.GEN CAP 5.ChgCurrToBAT 6.MAX RUN TIME 7.COOLDOWN	This interface shows Generator setting. 1. Refer to CONTROL. 2. When the SOC of battery is lower than the set point, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started. 3. When the SOC of battery is lower than the set point, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started. 4. Rated power of Generator. 5. It indicates the maximum current that the inverter charges the battery from Generator. 6. It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. The value 240 means 24hours in which state the Generator will not be shut down all the time. The unit is 0.1 hour. 7. It indicates the waiting time of the Generator to restart after it has reached the running time. The unit is 0.1 hour.

8.2.16.2 CONTRL

Interface	Description
GEN CONTROL 1.Generator En 2.Charge En 3. Auto Start 4.ManualCmd En 5.Connect Grid	This interface shows Generator CONTRL. 1. Enable control of the Generator function. 2. Generator Charge Enable control 3. If this function is enabled, the dry contact of the generator automatically draws and closes when the SOC of the battery reaches the SOC setting value of the generator startup, thus controlling the automatic startup of the generator. If this function is disabled, manually start the generator. 4. When enabled, the generator can be manually started. 5. Connect the diesel Generator to the grid input port.

8.2.16.3 START SOC

Interface	Description
STRART SOC INPUT: 020%	This interface is used to set the minimum battery capacity when starting the generator.

8.2.16.4 STOP SOC

Interface	Description
STOP SOC INPUT: 030%	This interface is used to set the maximum battery capacity when the generator is turned off (START SOC＜STOP SOC).

8.2.16.5 GEN CAP

Interface	Description
GEN CAP INPUT: 08.0 UNIT: KW	This interface is used to set the diesel generator power.

8.2.16.6 ChgCurrToBAT

Interface	Description
Chg Curr to BAT INPUT: 030 UNIT: A	This interface is used to set the battery charging current when the generator is used.

8.2.16.7 MAX RUN TIME

Interface	Description
MAX RUN TIME INPUT: 10.0 UNIT: hours	This interface is used to set the maximum running time of the generator.

8.2.16.8 COOLDOWN

Interface	Description
COOL DOWN TIME INPUT: 02.0 UNIT: hours	This interface is used to set the cooling time.

8.2.17 ADVAN SET

8.2.17.1 ADVAN SET

Interface	Description
ADVAN SET →1.Mode Set 2.Advan Ctrl 3.TOU Set 4.GridPowerLim	Mode Set: 1. Disable(Disable this option) 2. Load First(The PV power supplies power to the load first) 3. Sell First(PV power is preferentially sold) 4. BatChgFirst(The PV power preferentially charges the battery) Advanced mode can only be used in spontaneous self-use mode

8.2.17.2 Advan Ctrl

Interface	Description
ADVAN CONTROL →1.Grid Chg En 2.TOU En 3.GridLimitEn 4.ConstACPower	This interface is used to select enable Settings Press the up/down button to move the corresponding option Press Enter to enter the selected menu Press ESC to return to the Settings screen
Grid Chg En →1.DISABLE 2.ENABLE	The grid can charge the batteries
TIME OF USE →1.DISABLE 2.ENABLE	The battery time range operation function is enabled
GridLimitEn →1.DISABLE 2.ENABLE	Power grid limited enable

8.2.17.3 TOU Set

Interface	Description
TIME OF USE →1.Slot1 2.Slot2 3.Slot3 4.Slot4 5.Slot5 6.Slot6	Battery TOU enabled time range 1.The maximum allowable setting time is 24 hour (one day), It is allowed to set six different charging and discharging states within 24 hour(time1 twice,time2 twice,time3 twice), The inverter runs repeatedly every day according to the set time. 2.The inverter executes according to the settings of time1, time2 and time3 in the order of time. Different time periods do not overlap. Only three time periods are listed here, and the Settings for the remaining three pages are the same
SLOT1 →1.Slot1 2.GridChg1	
SLOT2 →1.Slot2 2.GridChg2	
SLOT3 →1.Slot3 2.GridChg3	

8.2.17.4 GridPowerLim

Interface	Description
POWER INPUT: +00.0 UNIT: KW	Grid limited power Settings

8.2.18 PARALLEL SET

8.2.18.1 PARALLEL

Interface	Description
PARALLEL →1.PARALLEL EN 2.NUMUADDRESS 3.MASTER/SLAVE 4.ADDRESS 5.COMMOM CT	PARALLEL EN: 1.Disable and enable

8.2.18.2 NUMUADDRESS

Interface	Description
NUMUADDRESS →PARAL NUM-- INPUT: 2	NUMUADDRESS: Set the number of parallel inverter.

8.2.18.3 MASTER/SLAVE

Interface	Description
MASTER/SLAVE -Parallel- → 1.Master 2.Slave	MASTER/SLAVE: Set the parallel inverter master/slave

8.2.18.4 ADDRESS

Interface	Description
ADDRESS --PARAL ADDRESS --INPUT: 0	ADDRESS: Set the parallel inverter address, master address is 1,slave address is 2.

8.2.18.5 COMMOM CT

Interface	Description
COMMOM CT -Commom CT- →1.DISABLE 2.ENABLE	COMMOM CT: 1.Disable and enable

8.3 INQUIRE

8.3.0 INQUIRE

Interface	Description
INQUIRE →1.INV MODULE 2.MODULE SN 3.FIRMWARE 4.RECORD 5.DIAGNOSE	Press Up/Down button to move corresponding options; Press Enter button to jump to the selected menu. Press ESC button to return to other interface.

8.3.1 INV MODULE

Interface	Description
MODEL 12K	This interface show inverter model.

8.3.2 MODULE SN

Interface	Description
S / N GUID: XXXXXXXX XXXXXXXXXXXXXX SN:FXXXXXXXXXXX	This interface show module SN.

8.3.3 FIRMWARE

Interface	Description
FIRMWARE ARM: V1.XX.XX DSP: V1.XX.XX	This interface show Software version.

8.3.4 RUNNING RECORDS

Interface	Description
REC(01) 02:Batdisconnect UP: 12-25 23:00 DOWN:	This interface show running recorders.

8.3.5 DIAGNOSE

Interface	Description
DIAGNOSE 000000 000000 000000 000000 000000 000000	Factory internal us

8.4 STATISTIC

8.4.0 STATISTIC

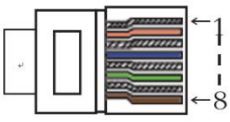
Interface	Description
STAT. →1.E-TODAY 2.E-MONTH 3.E-YEAR 4.E-TOTAL	This interface show inverter operation statistic. 1. Displays statistic for the day (KWH). 2. Displays statistic for the month (KWH). 3. Displays statistic for the year (KWH). 4. Displays statistic of the inverter (KWH).

Note: 1. E-TODAY/MONTH/YEAR/TOTAL→INPUT→PV/GRID(Consume)/BATD(Battery discharge)
→OUTPUT→BatC(Battery charge)/GRID(Generation)/CNSUM(Load consume)
2. If the inverter shut down before 24:00 on that day, and the day statistic will not be stored.

9. Generator Use Operation Guide

9.1 Generator Use Diagram

DRY IO PIN Defination
The communication interface between inverter and generator is DRY IO(when the generator is in automatic mode).



	PIN	1	2	3	4	5	6	7	8
DRY IO	Definition	DRYO_1A	DRYO_1B	DRYO_1C	DRYI_1	DRYI_1B	DRYO_2A	DRYO_2B	DRYO_2C

9.2 Generator Operation Notes

1) The generator's three-wire start signals DRYO_1A/DRY0_1B and DRYO_1A/DRY0_1C are used to automatically control the generator's start and stop, respectively.
2) Generators are not allowed in parallel inverters.
3) Please check the diagram above.
4) The generator provides two modes (automatic and manual) for control, please select one mode to use, do not set both at the same time.

9.3 Generator Setting

The Generator setting page can be visited in the following steps in the screen:
USER->1. SETUP->15.Generator

9.3.1 Setting

Interface	Description
Generator. →1.CONTROL 2.START SOC 3. STOP SOC 4.GEN CAP 5.ChgCurrToBAT 6.MAX RUN TIME 7.COOLDOWN	This interface shows Generator setting. 8. Refer to CONTROL. 9. When the SOC of battery is lower than the set point，the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started. 10. When the SOC of battery is lower than the set point，the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started. 11. Rated power of Generator. 12. It indicates the maximum current that the inverter charges the battery from Generator. 13. It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. The value 240 means 24hours in which state the Generator will not be shut down all the time. The unit is 0.1 hour. **14.** It indicates the waiting time of the Generator to restart after it has reached the running time. The unit is 0.1 hour.

9.3.2 CONTRL

Interface	Description
GEN CONTROL 1.Generator En 2.Charge En 3. Auto Start 4.ManualCmd En 5.Connect Grid	This interface shows Generator CONTRL. 6. Enable control of the Generator function. 7. Generator Charge Enable control 8. If this function is enabled, the dry contact of the generator automatically draws and closes when the SOC of the battery reaches the SOC setting value of the generator startup, thus controlling the automatic startup of the generator. If this function is disabled, manually start the generator. 9. When enabled, the generator can be manually started. 10. Connect the diesel Generator to the grid input port.

9.3.3 START SOC

Interface	Description
STRART SOC INPUT: 020% 	This interface is used to set the minimum battery capacity when starting the generator.

9.3.4 STOP SOC

Interface	Description
STOP SOC INPUT: 030% 	This interface is used to set the maximum battery capacity when the generator is turned off (START SOC＜STOP SOC).

9.3.5 GEN CAP

Interface	Description
GEN CAP INPUT: 08.0 UNIT: KW 	This interface is used to set the diesel generator power.

9.3.6 ChgCurrToBAT

Interface	Description
Chg Curr to BAT INPUT: 030 UNIT: A 	This interface is used to set the battery charging current when the generator is used.

9.3.7 MAX RUN TIME

Interface	Description
MAX RUN TIME INPUT: 10.0 UNIT: hours 	This interface is used to set the maximum running time of the generator.

9.3.8 COOLDOWN

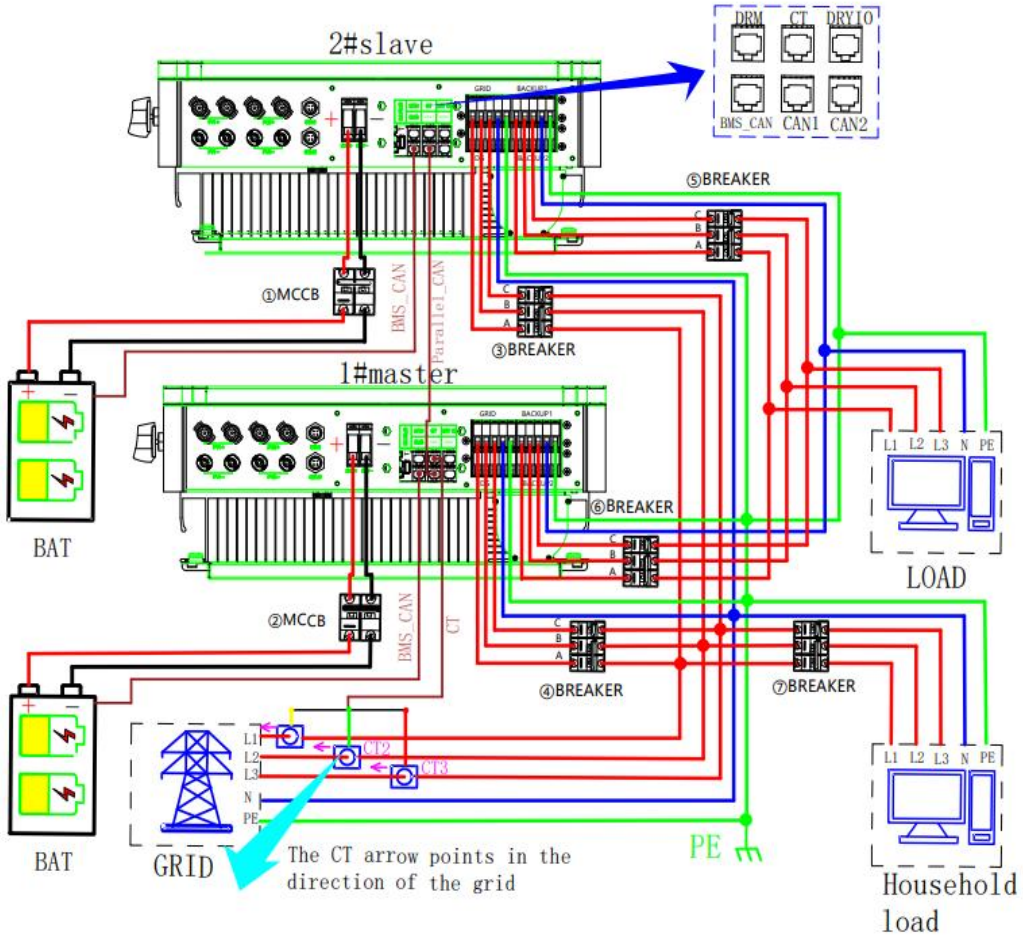
Interface	Description
COOL DOWN TIME INPUT: 02.0 UNIT: hours	This interface is used to set the cooling time.

10.Inverter Parallel Guide

10.1 Parallel System Diagram

Multiple inverters can be installed together to deliver more power. When EPS loads are present.There are two connection for EPS load --- EPS load parallel connection and EPS load independent.The system diagram is as follows.

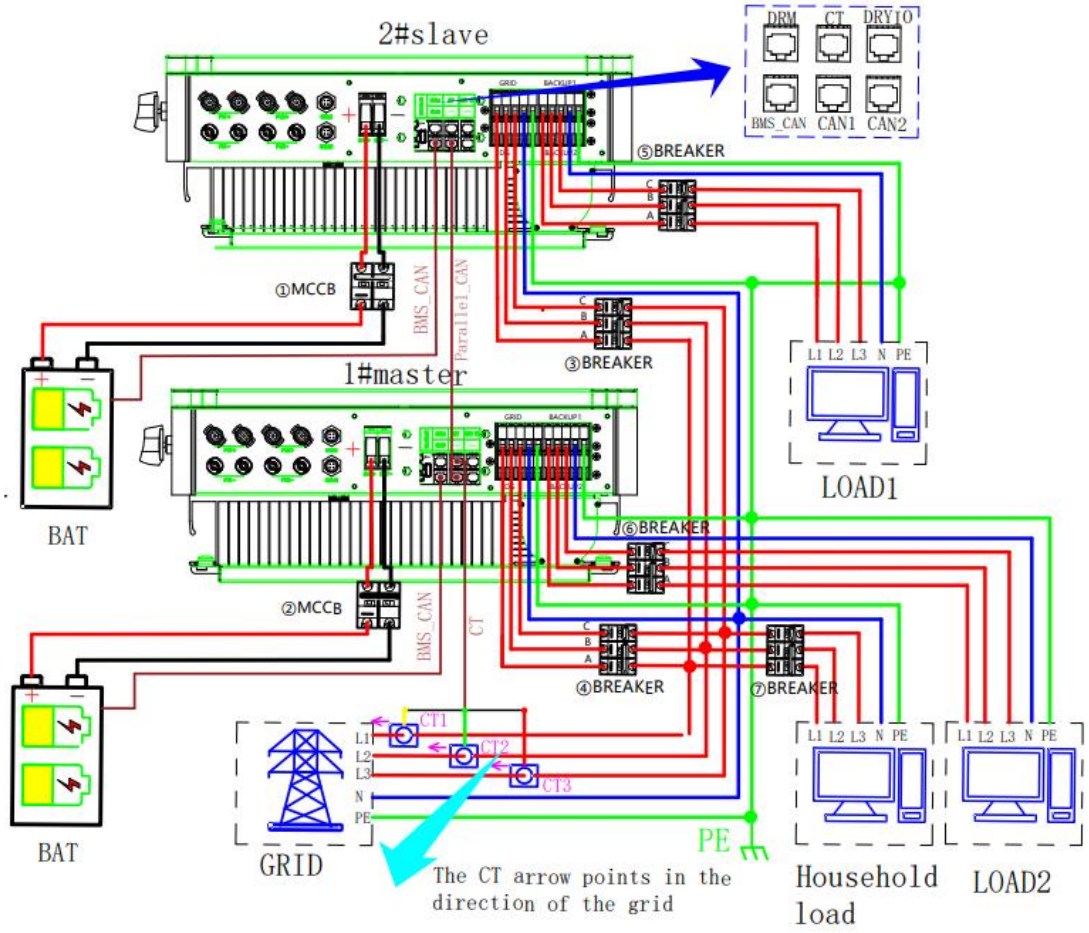
Parallel System Diagram 1 is EPS load parallel connection, Default connection method.



Notes:

1. This connection is the default setting for parallel.
2. When the parallel is enabled, if the CAN communication line between units is not connectedor the CAN communication between units fails, it will trigger a parallel CAN communication fault.
3. The inverter two-parallel only connects the parallel wire to the CAN1 port of the master and slave.

Parallel System Diagram 2 is EPS load independent connection



Notes:

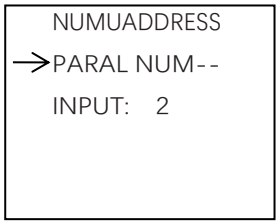
1. This connection is the default setting for parallel.
2. When the parallel is enabled, if the CAN communication line between units is not connectedor the CAN communication between units fails, it will trigger a parallel CAN communication fault.
3. The inverter two-parallel only connects the parallel wire to the CAN1 port of the master and slave.

10.2 Parallel Setting

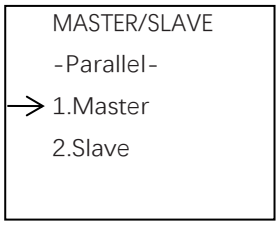
1.2.1 PARALLEL

Interface	Description
PARALLEL →1.PARALLEL EN 2.NUMUADDRESS 3.MASTER/SLAVE 4.ADDRESS 5.COMMOM CT	PARALLEL EN: 1.Disable and enable

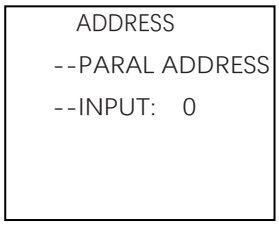
10.2.2 NUMUADDRESS

Interface	Description
	NUMUADDRESS: Set the number of parallel inverter.

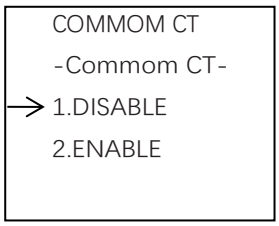
10.2.3 MASTER/SLAVE

Interface	Description
	MASTER/SLAVE: Set the parallel inverter master/slave

10.2.4 ADDRESS

Interface	Description
	ADDRESS: Set the parallel inverter address, master address is 1,slave address is 2.

10.2.5 COMMOM CT

Interface	Description
	COMMOM CT: 1.Disable and enable

11. Fault diagnosis and solutions

When you encounter the following problems, please refer to the Solutions below, and contact the local distributor if the problem remains unsolved. The following table lists some of the basic problems that may occur during the actual operation as well as their corresponding basic solutions.

Fault diagnosis table

Content	Codes	Explaination	Solutions
DischgOverCur	00	The discharge current set exceeds the current uploaded by the BMS to the inverter	Reduce the discharge current
Over Load	01	The load of the belt exceeds the rated power of the inverter	Reduce the load power
BatDisconnect	02	The battery and battery communication cable are not connected to the specified place in the inverter	Check whether the battery cable is connected to the battery communication cable and whether the battery is powered on
Bat Under Vol	03	The battery voltage is below the normal range	Charge the battery so that it exceeds the battery low voltage protection level
BatLow capacity	04	Battery range below normal range	Charge the battery so that its SOC value is greater than the battery's protection value plus the set SOC return difference
Bat Over Vol	05	The battery voltage is higher than the voltage uploaded by the battery BMS to the inverter	Measure whether the battery voltage is within the battery voltage range allowed by the inverter
Gird low vol	06	The mains voltage is lower than the local grid safety minimum	Check whether the local power grid name is selected
Grid over vol	07	The mains voltage is lower than the maximum value specified by the local power grid	
Grid low freq	08	The mains frequency is lower than the local grid safety minimum	

Grid overFreq	09	The mains frequency is lower than the maximum value specified by the local power grid safety regulation	Check whether the local power grid name is selected
Gfci over	10	Machine leakage	Check the wires for damage
Parallel CAN communication failure	11	Parallel line connection error or one of the host and slave machines is not powered up	Check whether the inverter has power, and the machine line connection is correct
Bus under vol	13	The internal bus voltage is low	The system is powered off and restarts (disconnect PV, battery, and mains, wait until the machine screen is off, and then power on again).
Bus over vol	14	High bus voltage inside the machine	Check whether the PV input voltage is too high
Inv over cur	15	The inverter current exceeds the limit current	Check whether the load power is too large or there is a large power motor load
Chg over cur	16	The charging current is set to exceed the current uploaded by the BMS to the inverter	Check whether the set current exceeds the rated charging current allowed by the battery
MeterCommFail	17	Meter communication is not connected to the specified position of the inverter	Check whether the cable to the meter is normal and connected to the specified position of the inverter
Inv under vol	18	The output voltage of the inverter is lower than the operating voltage of the device	The system is powered off and restarts (disconnect PV, battery, and mains, wait until the machine screen is off, and then power on again).
Inv over vol	19	The output voltage of the inverter is higher than the working voltage of the device	
InvFreqAbnor	20	The output frequency of the inverter is higher or lower than the operating frequency of the device	
Igbt temp high	21	The internal temperature of the inverter is too high	Wait 30 minutes for the inverter to cool down and then power on
Bat BMS failure	22	The battery BMS is faulty. Procedure	Contact Battery manufacturer

Bat over temp	23	High battery temperature	Power off the inverter and check the battery
Bat UnderTemp	24	The battery temperature is too low. Procedure	Power off the inverter and check the battery
Bat Cell Unball	25	Battery voltages vary greatly	
Bat Reverse	26	The positive and negative battery terminals are connected in reverse	Check whether the battery cable sequence is reversed
BMS comm.fail	27	The inverter failed to communicate with the lithium battery BMS	Check whether the BMS communication network cable of the inverter is correctly connected
Bat failure	28	Internal battery fault	System power failure Check the battery
Inv short	35	Ac short circuit	Check whether the AC cable is short-circuited
PV iso low	37	PV has low ground impedance	Check whether the PV cable is damaged and grounded properly
Bus Relay Fault	38	The soft-start relay on the power grid is faulty	The system is powered off and restarts (disconnect PV, battery, and mains, wait until the machine screen is off, and then power on again).
Grid Relay Fault	39	Relay short circuit	
Gfci fault	41	Abnormal leakage current	
Load CT fault	42	Internal CT fault	

Note: If an error occurs that is not listed in the table, Please Contact customer service.

NOTICE:

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