

USER MANUAL



RLS(F) SERIES All-in-One System

RLS3042, RLS3642, RLS4042,
RLS4642, RLS5042, RLS6042

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Preface

Copyrights

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Disclaimers

This equipment is designed to comply with Electromagnetic Compatibility (EMC) standards. However, electromagnetic interference (EMI) may still occur during operation due to factors such as installation environment, external devices, or other external conditions. The user is required to install and operate the device strictly in accordance with the provided instructions and to implement necessary measures to mitigate potential interference. The manufacturer shall not be liable for any interference issues resulting from improper installation, operation, or external environmental factors. For further assistance, please contact technical support.

Before using the product, please read this manual carefully to ensure you fully understand the product and can use it correctly. Please keep this manual properly for future reference after reading. Improper use of this product may cause serious injury to you or others, or result in product damage and property loss. By using this product, you are deemed to have understood, acknowledged, and accepted all terms and contents in this manual. BEIJING EPSOLAR TECHNOLOGY CO., LTD. shall not be liable for any losses caused by the user's failure to use the product in accordance with this manual.

The warranty does not apply to the following conditions:

- Damage caused by improper use or inappropriate environments (It is strictly forbidden to install the all-in-one system in the flammable, explosive, dust accumulative or other harsh environments).
- The actual current/voltage/power exceeds the limit value of the all-in-one system.
- Damage caused by working temperature exceeding the rated temperature range.
- Electric arc, fire, explosion and other accidents caused by failure to follow the all-in-one system labels or manual instructions.
- Unauthorized disassembly and maintenance of the all-in-one system.
- Damage caused by force majeure such as lightning strikes, rainstorms, mountain torrents and grid failures, etc.
- Damage occurred during transportation or loading/unloading the all-in-one system.

Scope of application

This user manual describes the installation, electrical connection, commissioning, maintenance and troubleshooting of the RLS series residential energy storage system (hereinafter referred to as "all-in-one system"). The RLS series includes the following product models:

RLS3042, RLS3642, RLS4042, RLS4642, RLS5042, RLS6042

This manual is only intended for professionals who are familiar with local regulations, standards and electrical systems, have received professional training, and know the product well.

Symbol definition

To ensure the user's personal and property safety during operation, as well as the efficient use of this product, relevant safety instructions are provided in the manual and highlighted with the corresponding symbols. To prevent personal injury and property damage, please fully understand and strictly follow these highlighted information. The symbols used in this manual are as follows:



DANGER

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



WARNING

Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.



CAUTION

Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an important reminder during the operation which, if ignored, may result in an equipment error alarm.

Tip

Indicates recommendation for reference.



Read through the user manual before any operations.

Important Safety Instructions

1. General safety instructions

DANGER

- The high voltage circuits in the all-in-one system can endanger lives!
- Only professional electrical engineers can operate this product, minors and people with disability/mental illness cannot use this product. Do not install the all-in-one system at a place within children's reach.

WARNING

- Ensure that the maximum AC input voltage and maximum photovoltaic (PV) output voltage (namely, the PV open circuit voltage after low temperature correction) does not exceed the maximum input voltage of the all-in-one system. Failure to do so may result in system damage or other losses, for which EPEVER reserves the right to exclude warranty and shall not bear any joint liability.
- Due to the high temperature of the case when the all-in-one system is running, be careful of being burned.
- When the all-in-one system is running, only the display and buttons of the all-in-one system can be touched.

NOTICE

The PV frame and bracket should be safely grounded in accordance with the local power department's grounding requirements!

2. Requirements for system installation

- The all-in-one system must be installed in full compliance with national and local grid standards and regulations.
- Before proceeding with the installation and commissioning, read and understand all instructions contained in this manual, familiarize yourself with relevant safety symbols.
- In accordance with national and state/provincial regulations, access to the power grid is only permitted after obtaining authorization from the power department, and the operation must be performed by a qualified electrical engineer.
- Before installing and maintaining the all-in-one system, cut off the DC power from the PV array and battery pack by the DC switch, as well as the AC power from the grid and generators by the AC switch. Failure to do so may result in high voltage causing serious injury.

3. Requirements for professional and technical personnel

Installation, operation, maintenance, and replacement of devices or components are permitted only for qualified professionals or trained personnel. Personnel responsible for the installation and maintenance of device must undergo rigorous training, understand various safety precautions, and master correct operating procedures.

4. Transportation precautions

Upon leaving the factory, the all-in-one system is already in its optimal electrical and mechanical condition. During transporting, it is imperative to use the all-in-one system's original packaging or appropriate packaging to ensure the safety. Damage to the all-in-one system caused during transportation is the responsibility of the shipping company. Upon pickup, please conduct a thorough inspection of the all-in-one system. If any packaging issues are found that may cause damage to the all-in-one system, or if any visible damage is found to the all-in-one system, please immediately notify the responsible shipping company. If necessary, you can seek assistance from your PV system installer or EPEVER.

5. Assembly precautions

Assemble the all-in-one system according to the details in the following sections of this manual. Place the all-in-one system on an object (such as a wall or component bracket) with appropriate load-bearing capacity, ensuring it is placed vertically. Choose a suitable location for the installation of electrical equipment, ensuring sufficient space for fire escape routes to facilitate maintenance in case of failure. Maintain appropriate ventilation conditions to ensure adequate air circulation for cooling, with air humidity less than 95% during assembly.

6. Inverter label

HYBRID INVERTER Model: ERS6042			
PV INPUT		BACK-UP OUTPUT	
Vmax PV	580d.c.V	Rated Voltage	230a.c.V
MPPT Range	100d.c.V ... 550d.c.V	Rated Current	26a.c.A
Max.Current	16d.c.A x 2	Rated Power	6000VA
Isc PV	19.2d.c.A x 2	Frequency	50Hz/60Hz
BATTERY INPUT		Output Power Factor	1.0
Type	Lithium-ion/Lead-acid	GEN Data	
Voltage Range	42d.c.V ... 63d.c.V	Gen Max. continuous current	26a.c.A
Max.Charging Current	120d.c.A	Gen Rated Power	6000VA
Max.Discharging Current	120d.c.A	OTHER	
GRID OUTPUT&INPUT		Operating Ambient Temp	-30°C ... +60°C
Nominal Voltage	230a.c.V	Protective Class	I
MaX.Current To Utility	26a.c.A	PV Inverter Topology	No-isolated
MaX.Current From Utility	55a.c.A	Ingress Protection	IP65
Rated Power To Utility	6000VA	Overvoltage Category	II (DC), III (AC)
Frequency	50Hz/60Hz	IEC/EN 62109, IEC/EN 62477-1, IEC 62040-1	
Power Factor Range	0.8leading-0.8lagging		



EPEVER® Rechargeable Li-ion Battery Module	
Model:	LS51100R
Battery Type	Lithium-ion
Total Energy	5.12KWH
Nominal Voltage	51.2Vdc
Rated Capacity	100Ah
Charging Temperature	0°C~50°C
Discharging Temperature	-20°C~50°C
Storage Temperature	5°C~35°C
Relative Humidity	20%~80%
Max.Charging Current	50A
Max.Discharging Current	100A
Ingress Protection	IP65
Size (L*W*H)	620mm*400mm*219mm
Weight	49±0.5KG
	
 RoHS UN38.3	
HUIZHOU EPEVER TECHNOLOGY CO.,LTD. Add: No. 6 Laowu Road, Start-up Area of China-Korea (Huizhou) Industrial Park, Zhonghai District, Huizhou City, Guangdong Province, China MADE IN CHINA www.epeer.com DISPOSAL OF BATTERIES SHOULD FOLLOW LOCAL REGULATIONS.	

Labels must not be covered by unrelated objects (such as rags, cardboard boxes, equipment, etc.). Regular wiping is necessary to keep them visible at all times.

7. Explanations of symbols

The RLS series all-in-one systems come with some safety related labels. Ensure you carefully read and fully understand the labels before installing.

Symbol	Definition
	Residual Power Discharge Delayed discharge. Wait 5 minutes after power off until the components are completely discharged.
	Electric Shock Hazard The device contains fatal DC and AC power. All work on the device must be carried out by qualified personnel only.
	Beware of Hot Surface High-temperature hazard. Do not touch the product under operation to avoid being burnt.
	Caution Potential risks exist. Wear proper Personal Protective Equipment before

	any operations.
	CE Mark The device complies with the requirements of the applicable CE guidelines.
	Grounding Terminal Connect the device with grounding terminal to achieve grounding protection.
	Read through the user manual before any operations.
	Electrical Polarity Mark Pay attention to the polarity of the electrical connection.
	Temperature Mark Indicates the operating temperature range.
	Up Mark The device must always be transported, handled, and stored in such a way that the arrows always point upwards.

8. Electrical connection precautions

When handling energized devices, comply with all current state regulations related to the prevention of electrical accidents.

DANGER

- All installation operations must be carried out by professional electrical engineers who have received training, thoroughly read this manual, and fully understood the relevant safety considerations.
- Ensure that the PV arrays are covered with opaque materials or the DC circuit breaker is disconnected before electrical connections. Exposure to sunlight will cause the PV array to generate dangerous voltages.
- When connecting to the AC power, ensure that the breaker is disconnected.

NOTICE

The all-in-one system can only be connected to the grid after obtaining permission from the local power department and ensuring all electrical connections are completed by a professional electrical engineer.

9. Operating precautions



DANGER

- Touching the terminals of the power grid or PV array, etc., may cause death from electric shock or fire!
- Do not touch terminals or conductors connected to the grid and PV circuit.



WARNING

Please wear protective gloves when operating the all-in-one system as some internal components will heat up.

NOTICE

Pay attention to any instructions or safety documentation related to grid connections.

10. Maintenance precautions



DANGER

Before any maintenance, the electrical connection between the all-in-one system and the grid should be disconnected first, followed by the disconnection of the DC side. Wait for at least 5 minutes until the internal components are fully discharged.

NOTICE

- The all-in-one system can be restarted after removing the faults, which affects the safety performance. If any maintenance is required, please contact the local authorized service center.
- Unauthorized disassembly or alteration of components within the all-in-one system is prohibited. Any losses caused by this will not be covered by the warranty or joint liability of EPEVER.

11. Safety instructions for lithium battery

- Lithium batteries must be stored separately and stored in outer packaging to avoid mixed storage with other items, open-air storage and high stacking.
- Move the lithium battery in accordance with the required direction, do not place a battery upside down or tilt it to avoid battery collision.
- Before installing lithium batteries, check whether the packaging is intact. Do not use lithium batteries with damaged packaging.
- When installing lithium batteries, please pay attention to the positive and negative poles, do not short circuit the positive and negative poles of a lithium battery.

- When installing lithium batteries, if a battery drops or is hit by a strong impact, it may cause internal damage in the equipment, and it is strictly forbidden to use it; otherwise, there will be a safety risk (such as cell leakage, electric shock, etc.).
- After a lithium battery drops, if there is an obvious damage or abnormal odor, smoke, or fire occurs, evacuate the personnel immediately, call emergency services, and contact the professionals. The professionals can use fire extinguishing facilities to extinguish the fire under safety protection.
- After a lithium battery drops, if the appearance is not obviously deformed or damaged, and there is no abnormal odor, smoke, or fire, contact the professionals to transfer the lithium battery to an open and safe place, or contact a recycling company for disposal.
- Do not perform welding or grinding work around lithium batteries to prevent fire caused by electric sparks or arcs.
- Do not use a damaged lithium battery, which may release flammable gas.
- Do not use a lithium battery whose warranty period has expired. If lithium batteries are out of service life, contact a lithium battery recycling company for disposal.
- Dispose of waste lithium batteries in accordance with local laws and regulations. Do not expose waste lithium batteries to direct sunlight, high temperature, high humidity or corrosive substances. Do not dispose of lithium batteries as household waste. Improper disposal of lithium batteries may result in environmental pollution.
- Please use the lithium batteries within the temperature range specified in this manual.
- When the lithium battery temperature is too high, it will cause the battery deformation, damage and electrolyte overflow and the leakage of toxic gases.
- In the case of electrolyte leakage or abnormal odor, avoid contact with the leaked liquid or gas. Please contact the professionals immediately.
- If a fire occurs, the system should be powered off under safety protection. Use carbon dioxide, FM-200 or ABC dry powder fire extinguishers to extinguish the fire.



DANGER

- Do not expose lithium batteries at high temperatures or around heat sources, such as scorching sunlight, fire sources, transformers and heaters. Lithium battery overheating may cause fire or explosion.
- To avoid leakage, overheating, fire or explosion, do not disassemble, alter, or damage lithium batteries, for example, insert foreign objects into batteries, or immerse batteries in water or other liquids.
- Do not touch battery terminals with other metal objects, which may cause heat or electrolyte leakage.

1 General Information

1.1 Product overview

The RLS series residential all-in-one energy storage system features a modular stacking design, offering flexible configuration, easy installation, and scalability. The system combines one on-grid hybrid inverter (ERS series) with high-performance LiFePO₄ batteries (one to six units LS51100R) to provide reliable and sustainable solar energy storage. The system supports flexible charging options, including grid power, generators, and solar power. It also offers multiple power supply modes, including grid bypass, off-grid power supply, and grid-connected power generation. Each lithium battery module has a capacity of 5.12kWh, with a maximum configurable capacity of 30.72kWh.

The system supports expansion through parallel connection of up to nine units in single-phase configuration or by forming a three-phase system, delivering output voltages of 220VAC (single-phase parallel) or 380VAC (three-phase configuration).

The host unit enables self-consumption of solar energy, allowing excess power to be fed back to the grid or stored in batteries, thereby reducing grid dependency and providing backup power during outages. It also features an uninterruptible power supply (UPS) function, supporting seamless switching for inductive loads (such as air conditioners and refrigerators) with a transition time of less than 10 milliseconds.

The display module incorporates a large color dot-matrix touch LCD screen that clearly displays system operating data and status. Equipped with a standard Modbus communication interface, it facilitates expanded applications and adapts to various monitoring requirements.

Features

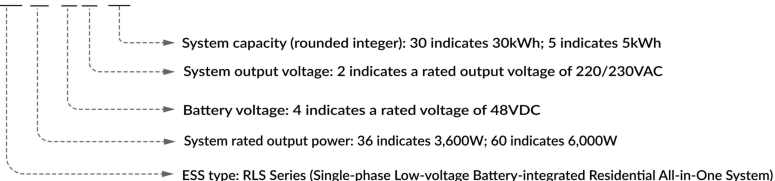
- All-digital integrated energy storage system with multi-energy management
- Modular, stackable design for convenient and independent installation and maintenance
- Built-in LiFePO₄ battery with high cycle stability and long service life
- Pure sine wave output
- Fanless cooling technology, with IP65 rating for dust and water resistance
- User-friendly APP interaction via included Wi-Fi module
- ≤10ms switchover time to ensure uninterrupted power for critical loads
- Maximum charging and discharging current up to 120A
- PV maximum input power up to 9,000W, support oversizing up to 1.5 times the rated power
- PV input voltage range from 100V to 580V
- PV maximum working current of 16A plus 16A

- High standard protection on the DC side, standard surge level II protection and optional AFCI function
- Independent smart port for generator energy supply, smart load, and AC coupling management
- Feed-in power limit function (Zero export function)
- Up to 94.6% of maximum battery charging and discharging efficiency
- Multiple AC parallel function for more flexible system solutions
- Optional RS485/WiFi/GPRS modules for smart monitoring
- RSD rapid shutdown to reduce device damage and prevent personnel injury

Naming rules

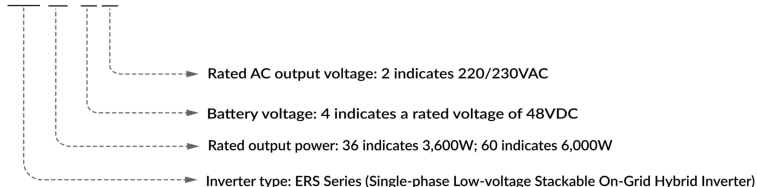
- **All-in-one Energy Storage System**

RLS 60 4 2 - 30



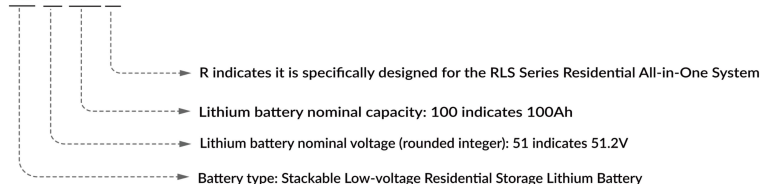
- **On-Grid Hybrid Inverter**

ERS 36 4 2



- **Lithium Battery**

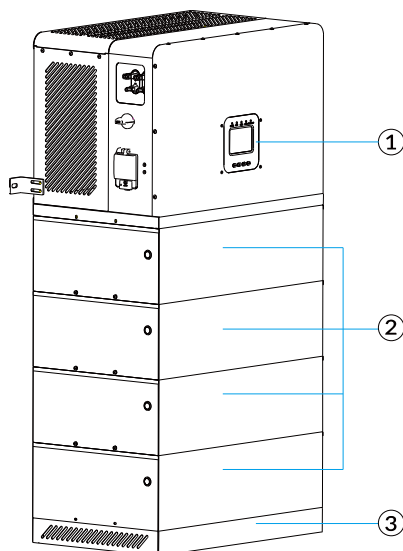
LS 51 100 R



1.2 Product exterior

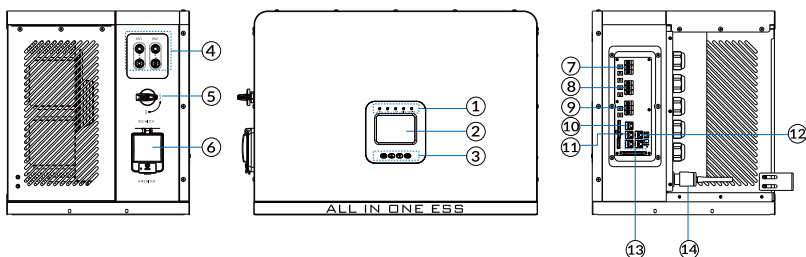
1.2.1 Appearance and ports

- Overall



No.	Description	No.	Description
1	Inverter (On-grid hybrid inverter)	3	Base
2	Lithium battery pack (with optional quantity of 1-6)		

- On-Grid Hybrid Inverter

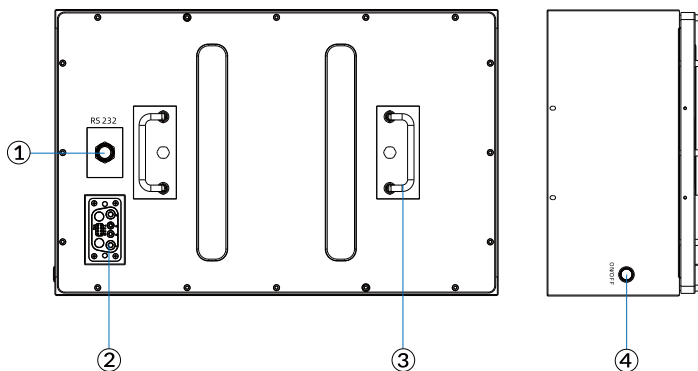


No.	Description	No.	Description
1	Indicators	8	Back-up Load port ⁽¹⁾
2	LCD	9	Grid connection port
3	Buttons	10	CT/Meter ⁽²⁾
4	PV input terminals	11	COM1 ⁽²⁾
5	DC Switch	12	COM2 ⁽²⁾
6	Battery Switch	13	Parallel communication port ⁽²⁾
7	Smart (GEN) port	14	WiFi/GPRS com. port ⁽²⁾

(1) Also referred to as Emergency Load Port, Critical Load Port, or Off-grid Load Port, denotes a dedicated output that is powered by the all-in-one system using energy from the battery when the system switches to off-grid operation following a grid outage.

(2) Please refer to Section [3.8 Connecting the communication ports](#) for details.

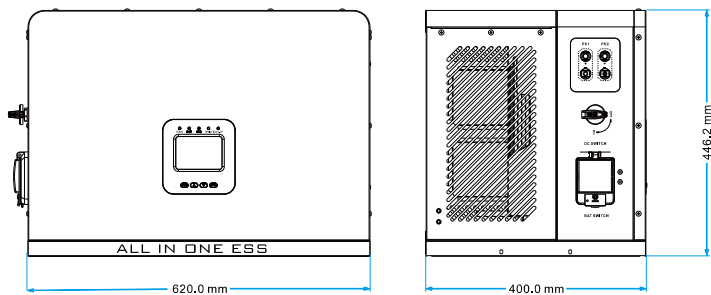
- Lithium Battery**



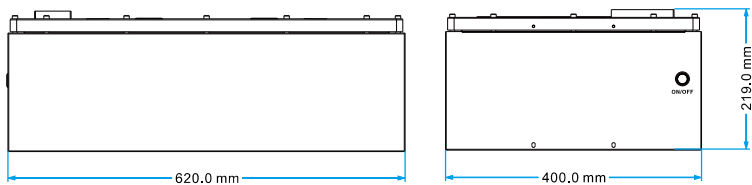
No.	Description	No.	Description
1	RS232	3	Handle
2	Plug-in terminal	4	Battery power on/off button

1.2.2 Dimensions

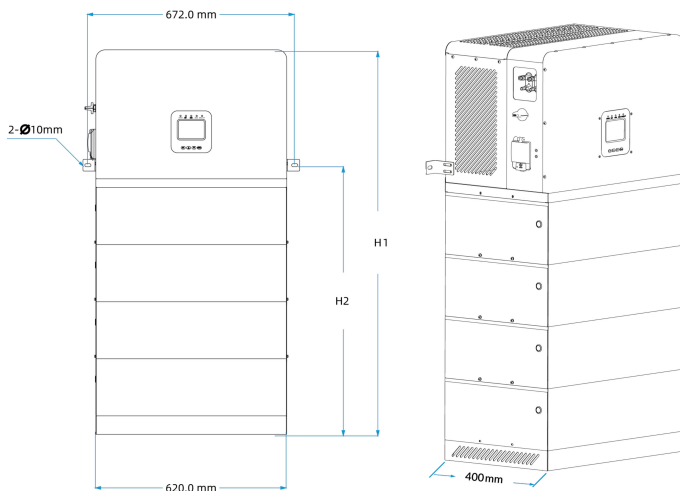
- On-Grid Hybrid Inverter



- Lithium Battery

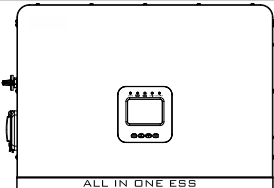
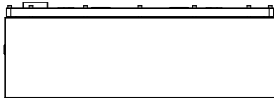
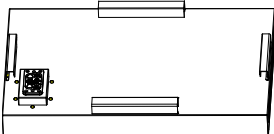


- All-in-one Energy Storage System



Quantity	System Capacity	H1 (mm)	H2 (mm)
1	5.12KWh	691.2	317.4
2	10.24KWh	876.2	502.4
3	15.36KWh	1061.2	687.4
4	20.48KWh	1246.2	872.4
5	25.6KWh	1431.2	1057.4
6	30.72KWh	1616.2	1242.4

1.3 System components

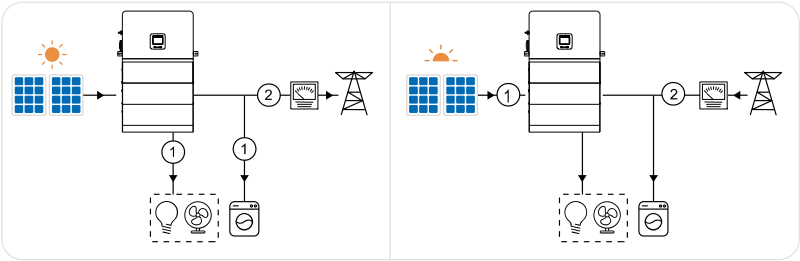
No.	Name	Illustration	Quantity
1	On-Grid Hybrid Inverter (included)		1 PCS
2	Lithium battery pack (included)		1 - 6 PCS in parallel (configurable quantity)
3	Base for lithium battery pack (included)		1 PCS

1.4 Energy Storage System (ESS) modes

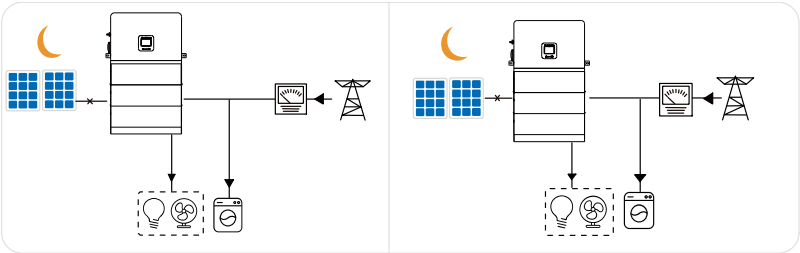
1.4.1 Self consumption mode

Day time: When the power generated in the PV system is sufficient, it will supply the loads in priority. And the excess power will charge the batteries first. The remaining power will be sold to the grid.

When the power generated in the PV system is insufficient or no power is generated, the battery will supply the loads in priority. If the battery power is insufficient, then the load will be powered by the grid.



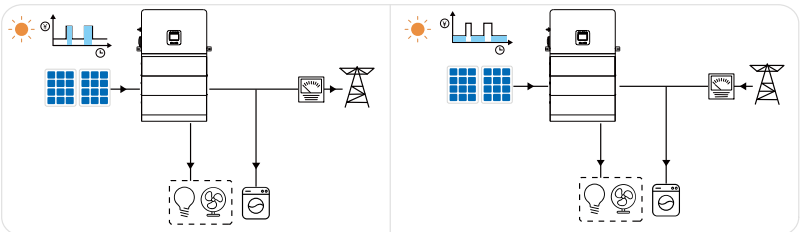
Night: If the battery power is sufficient, the load will be powered by the battery. If the battery power is not enough, the load will be powered by the grid.

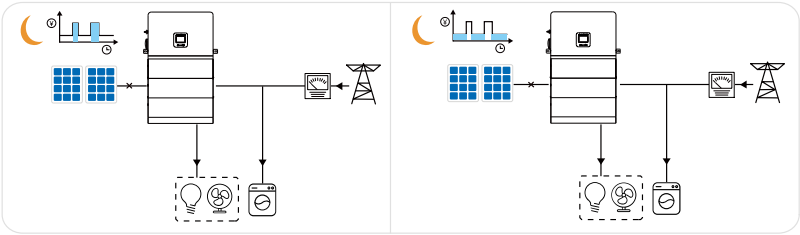


Scenario recommendation: It is suitable for areas with high electricity prices and little or no solar power generation subsidies.

1.4.2 Economic mode

Users can set the grid charging power based on their own electricity demand and price, enabling battery charging during periods of low electricity demand and switching to a self-consumption mode during high electricity demand periods. The high and low electricity demand can be divided by season, week, and time of day, with summer and winter primarily determining high and low demand, weekdays and weekends primarily determining electricity usage, and day and night primarily determining electricity demand.

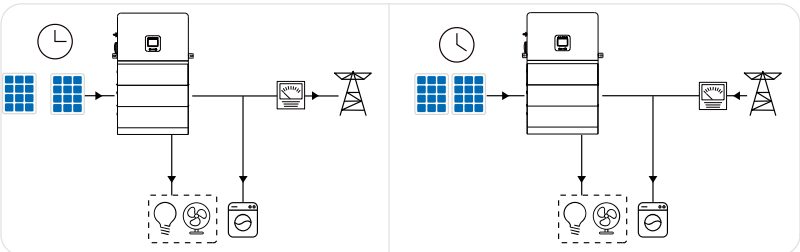




Scenario recommendation: Users with distinct high and low electricity demand, such as less electricity during weekdays and more on weekends, can set up battery charging at night on weekends. For example, if local summer PV generation significantly differs from winter, battery charging can be scheduled at night during winter.

1.4.3 Time-of-use mode

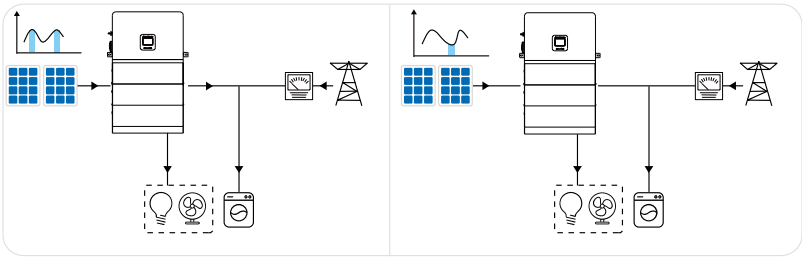
The system performs the charging and discharging according to the set charging/discharging period and power.



Scenario recommendation: It is suitable for scenarios when the peak-valley electricity price varies a lot, and it can only be used when local laws and regulations are met, such as whether the battery is allowed to discharge and sell to the power grid. When the electricity price is at its valley, set the time for the grid to charge the battery. When the electricity price is at its peak, the battery will power the load first, and the remaining power can be sold to the grid. Thereby earning the corresponding profit from the grid price difference.

1.4.4 Peak shaving mode

Users can set the peak shaving power according to the actual need. During peak hours, the all-in-one system limits the power supplied by the grid. The insufficient power is provided by PV and battery, reducing the local electricity consumption. During off-peak hours, the grid charges the battery, and supplies power to the load simultaneously.

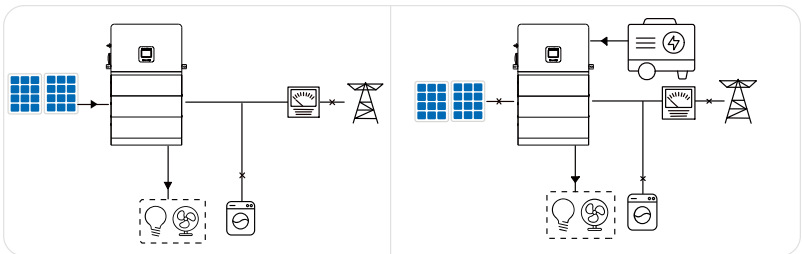


Scenario recommendation: Recommended for use in areas with high electricity consumption.

1.4.5 Emergency power supply mode

Tip This mode is not an independent and optional operation mode; rather, it is determined by “EPS enable” (the emergency power supply enable) setting in the basic configuration.

When the power grid is cut off, PV will supply the loads in priority; if the PV power generation cannot meet the load usage, the battery discharges to supplement. If the PV power generation exceeds the load demand, the surplus power charges the battery. When the battery runs out of energy, the system can switch to a diesel generator mode, and then the generator supplies power to the load.



Scenario recommendation: Recommended for use in areas with unstable power grid.

2 Installation

2.1 Installation requirements



DANGER

- Do not install the all-in-one system in a place near flammable, explosive, or corrosive materials.
- Do not install the all-in-one system in a place that is easy to touch, especially within children's reach.



WARNING

High temperature exists when the all-in-one system is working. Do not touch the surface to avoid burning.

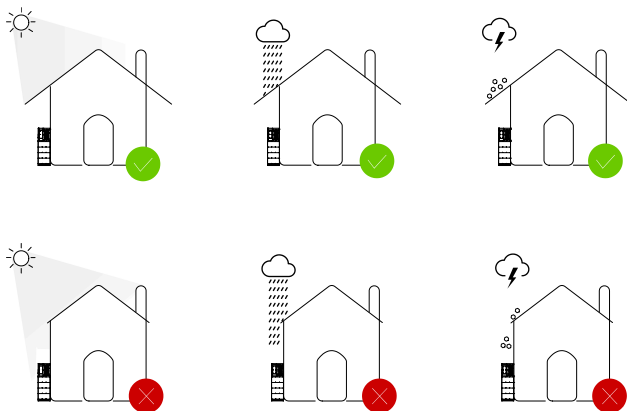


CAUTION

When transporting and moving the all-in-one systems, the weight of the equipment should be considered. Determine the installation position. At least two persons are required to install the all-in-one system.

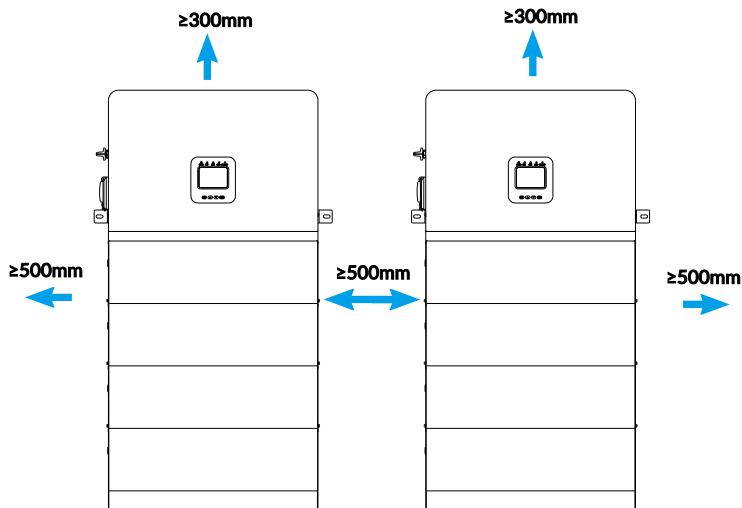
2.1.1 Installation environments

- The place to install the all-in-one system shall be well-ventilated for heat radiation.
- Installation environment temperature range: -30°C to 60°C, relative humidity: 0 to 95% (non-condensing).
- To prevent performance degradation due to temperature rise, install the all-in-one system in a shaded location or under a sunshield.
- Do not install the all-in-one system in a place near flammable, explosive, or corrosive materials.
- The installation carrier must be fireproof; do not install the all-in-one system on flammable materials.
- Ensure the installation surface is sturdy and meets the load-bearing requirements for the all-in-one system.
- Do not install the all-in-one system on the support with poor sound insulation to avoid the noise generated by the working product, which may annoy the residents nearby.
- The altitude to install the all-in-one system must not exceed 4,000 meters.



2.1.2 Installation space

When installing the all-in-one system, a certain amount of space should be reserved to ensure that there is enough space for installation and heat dissipation.



2.1.3 Installation tools

Prepare the following tools to install and connect the all-in-one system.

 Hammer drill (6mm drill bit recommended)	 Slotted screwdriver	 Crosshead screwdriver (4mm)	 Disassembly tools	 Multimeter
 Wrench (open end $\geq 32\text{mm}$)	 Wire stripper	 Crimping tool	 Hexagonal Wrench (4mm)	 Marker
 Level	 Tape measure	 Safety gloves	 Safety goggles	 Dust Mask

2.2 Installation flow

2.2.1 Checking before installation

- Check packing

Packaging materials and components may be damaged during transportation. Therefore, before installing the all-in-one system, please inspect its packaging materials. Check the packaging for any damage, such as holes, cracks, etc. If any severe damage is found on the packages, do not open the package and contact your dealer as soon as possible. It is recommended to inspect the packaging materials within 24 hours before installing the all-in-one system.

- Check accessories list

After unpacking the all-in-one system, inspect the product and its accessories to ensure they are complete and undamaged. If any parts are missing or damaged, please contact the dealer.

2.2.2 Moving the all-in-one system

To safely remove and transport the unit, open the outer shipping case. With the case open, two operators should carefully lift the all-in-one system—one gripping the side handles while the other supports the chassis base. Once clear of the packaging, carry the all-in-one system horizontally to its designated installation location.



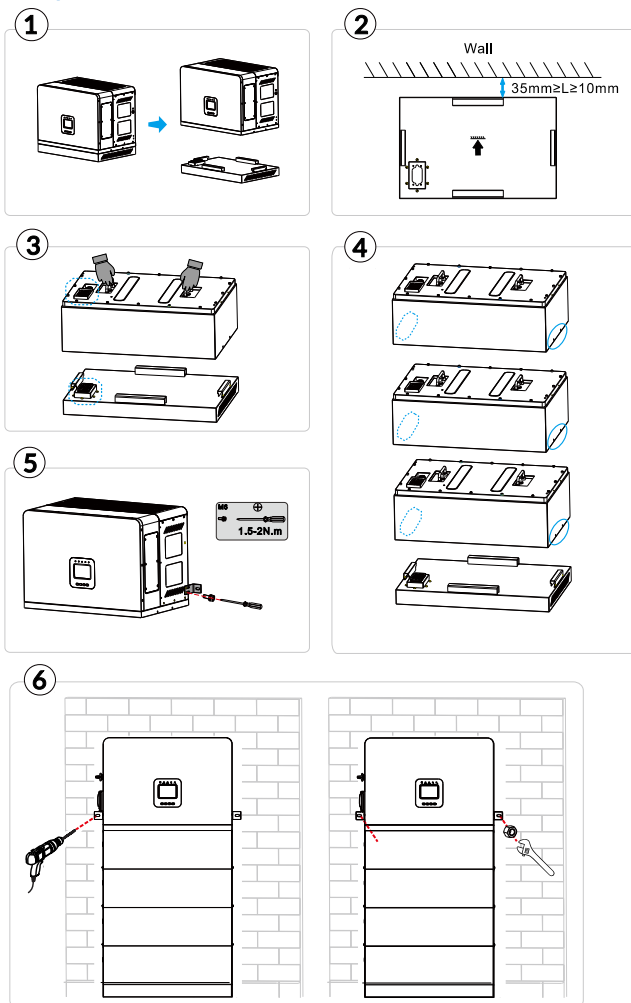
CAUTION

Please maintain balance when moving the all-in-one system to avoid dropping and injuring the operator.

NOTICE

When placing the all-in-one system on the ground, use foam or cardboard underneath to prevent damage to the casing.

2.2.3 Installing the all-in-one system



Step 1: Unpack the inverter main unit carton and separate the inverter from the base.

Step 2: Place the base against the wall, maintaining a 10–35 mm gap between the base and the wall surface.

Step 3: Unpack the battery carton, grip the two handles, and stack the battery onto the base; ensure the battery connector aligns with the base connector on the same side.

Step 4: Repeat [Step 2](#) to stack additional batteries as required; prior to stacking the next battery, ensure all screws between the previous battery and the adjacent battery/base are fully tightened.

Step 5: Remove the inverter and attach the mounting brackets to the inverter.

Step 6: Stack the inverter onto the batteries and secure it; drill holes at the positions marked by the mounting brackets and install expansion bolts for fixed mounting.

NOTICE

Destructive torque requirement: M8 $\geq$ 12 N·m; M4 $\geq$ 1.8 N·m

3 Connection

3.1 Precautions

Before installation or maintenance, ensure the equipment has been fully powered off for at least 5 minutes. Failure to do so may result in electric shock from residual high voltage in internal components.



DANGER

Before carrying out the electrical connections at the DC side, ensure that the PV panels are covered with opaque material or disconnect the circuit breaker at the DC side. If the PV panels are exposed to sunlight, the PV array will generate hazardous voltages.



WARNING

- The installation and maintenance of all-in-one systems must be carried out by professional electrical engineers. When working on high-voltage/high-current systems (such as inverters and battery systems), rubber gloves and protective clothing (including protective glasses and boots) should be worn.
- The open-circuit voltage of the PV modules connected to the RLS system should not exceed 580V. The connected PV modules must have an IEC61730 Class A rating.

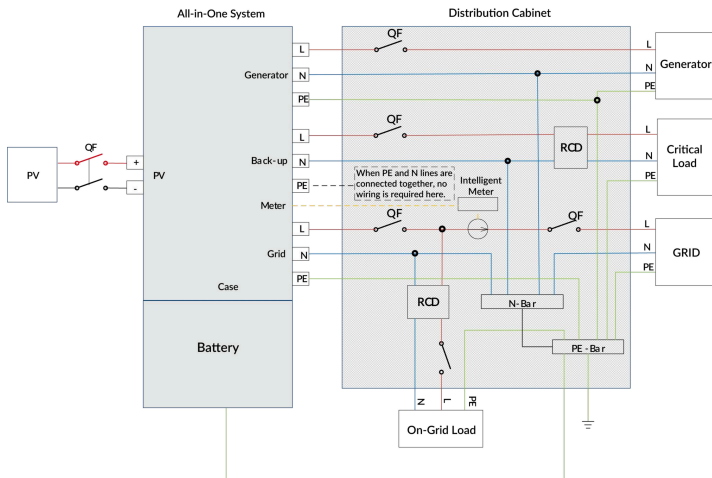
3.2 System schematic diagram

NOTICE

N and PE wiring via GRID and BACK-UP ports of the all-in-one system are different based on the regulation requirements of different regions. Refer to the specific requirements of local regulations.

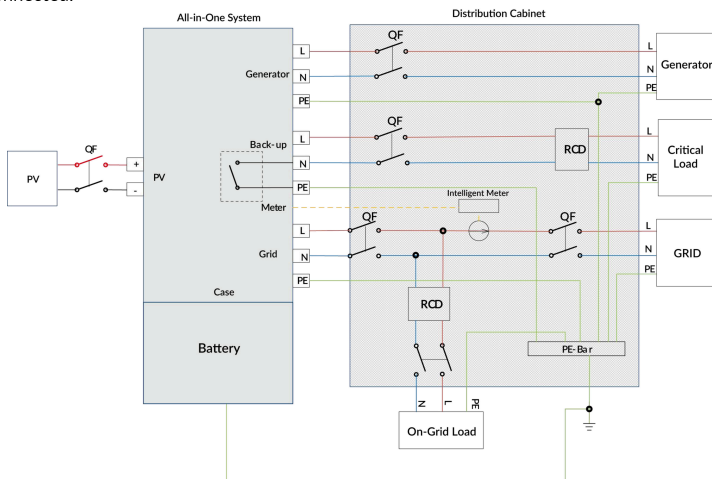
Scenario 1: N and PE wires are bonded together in the distribution cabinet (applicable to areas in Australia, New Zealand, South Africa.)

The PE-N relay bonding function is not required to be enabled.



Scenario 2: N and PE wires are not bonded together in the distribution cabinet (applicable to areas except for Australia, New Zealand, South Africa.)

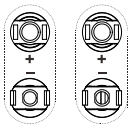
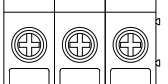
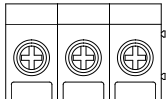
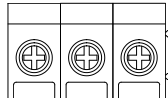
According to local regulations, the energy storage system requires PE-N bonding, and the all-in-one system's PE must be bonded to the distribution cabinet's PE. The RLS series all-in-one systems are equipped with a PE-N bonding function: when the all-in-one system operates in off-grid mode, PE and N are bonded; when the all-in-one system operates in on-grid mode, PE and N are disconnected.



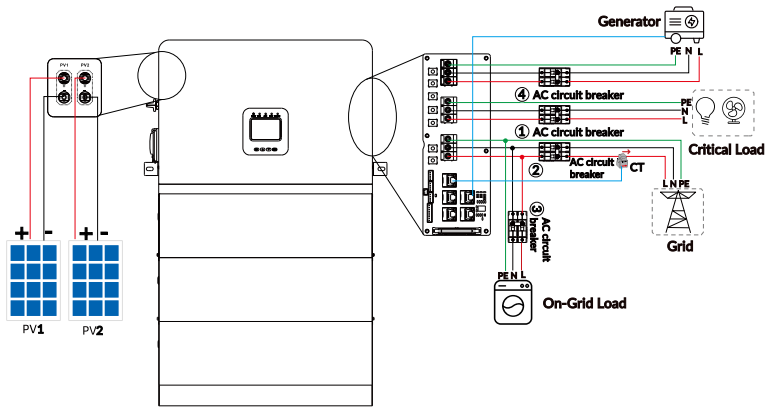
NOTICE

The PE-N relay bonding function is disabled by default. To enable this function, please operate on the APP. For details, please refer to Section [4.3 APP settings](#).

3.3 Port cable description

Port	Definition		Cable type	Cable specification
PV1 PV2 	+: Connecting to the positive terminal of the PV array. -: Connecting to the negative terminal of the PV array.		Outdoor multi-core copper cable	4mm ² to 5mm ²
BACK-UP PE LOAD_N LOAD_L 	Load	L		6mm ² to 8mm ² (RLS3042, RLS3642)
		N		8mm ² to 10mm ² (RLS4042, RLS4642, RLS5042, RLS6042)
		PE		
GRID PE GRID_N GRID_L 	AC	L		10mm ² to 12mm ² (RLS3042, RLS3642)
		N		12mm ² to 16mm ² (RLS4042, RLS4642, RLS5042, RLS6042)
		PE		
GEN PE GEN_N GEN_L 	Smart AC	L		6mm ² to 8mm ² (RLS3042, RLS3642)
		N		8mm ² to 10mm ² (RLS4042, RLS4642, RLS5042, RLS6042)
		PE		

3.4 Recommended circuit breaker size



① ③ ④ DC breaker

Model	Rated Voltage	Rated Current
RLS3042	400VAC	30A
RLS3642		
RLS4042		40A
RLS4642		
RLS5042		
RLS6042		

② AC breaker

Model	Rated Voltage	Rated Current
RLS3042	400VAC	40A
RLS3642		50A
RLS4042		63A
RLS4642		
RLS5042		
RLS6042		

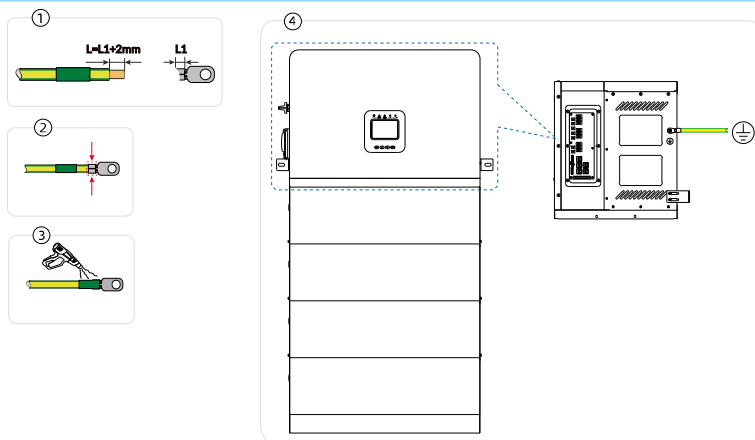
NOTICE

The above-specified wire gauge and circuit breaker are for reference only. Select the appropriate wire gauge and circuit breaker based on actual operating conditions.

3.5 Connecting the ground cable (PE)

NOTICE

- Since the all-in-one system is non-transformer, it is required that both the positive and negative terminals of the battery and PV array cannot be grounded, otherwise the all-in-one system failure will occur. In the PV power generation system, all non-current-carrying metal components (e.g. brackets, shells of combiner box/distribution cabinet, or inverter etc.) should be connected to the ground.
- After crimping the conductor crimp tab of the terminal, the formed cavity shall fully encapsulate the cable conductor, and the cable conductor shall be firmly bonded to the terminal.



Step 1: Prepare a grounding cable (recommended to use yellow-green outdoor power cable with cross-sectional area $\geq 6\text{mm}^2$).

Step 2: Use wire strippers to strip the insulation layer of the grounding cable to a suitable length (as shown in Figure ①).

Step 3: Insert the stripped wire into the OT terminal and crimp it tightly with wire crimper (as shown in Figure ②). Recommended OT terminal model: OTM6.

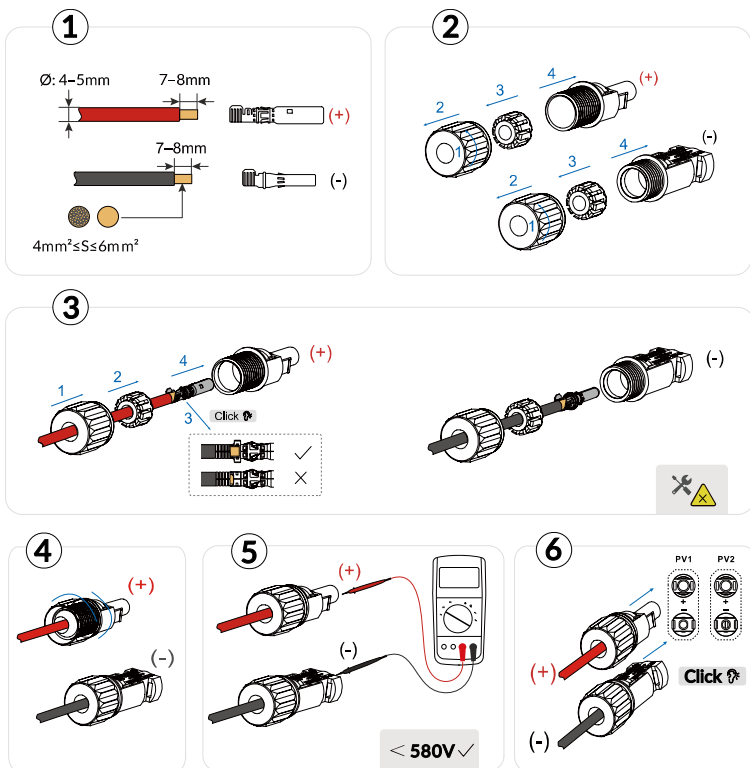
Step 4: Secure the OT terminal with an M6 screw at the position shown in Figure ④, with a

recommended tightening torque of 2 N·m.

NOTICE

The cavity formed by crimping the terminal's conductor crimp sleeve should completely enclose the cable, and the cable should be tightly secured with the terminal.

3.6 Connecting the PV modules



Step 1: Select the appropriate cable type and specification according to Section 3.3 Port cable description. And remove the cable connectors from the PV cables. It is recommended to differentiate the positive and negative terminals with different colors.

Step 2: Use wire strippers to strip the insulation layer of the PV cable to a suitable length (as shown in Figure ①).

Step 3: Insert the stripped cables into their respective positive and negative metal terminals. Use wire crimper to firmly press the cables, ensuring a secure connection between the cables and the metal terminals.

Step 4: Thread the crimped PV cables through the locking nuts, then insert them into its respective plastic housings until you hear a "click" sound, indicating that the metal cores are securely seated, after which tighten the locking nuts.

Step 5: Use a multimeter to check the positive and negative poles of PV cables, and then, connect them to the PV terminals of the all-in-one system accordingly.



WARNING

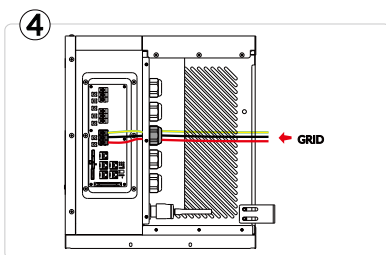
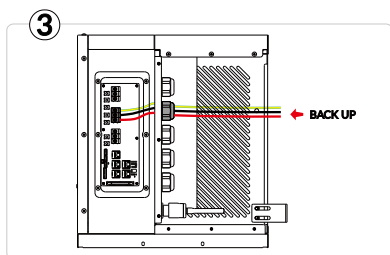
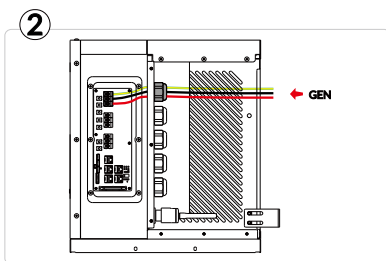
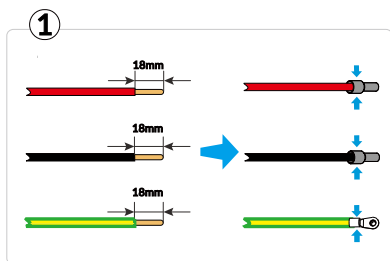
- Ensure the "DC SWITCH" has been rotated to "OFF" before removing the PV connectors, and verify that the "+" (positive) and "-" (negative) poles of all components are correctly connected.
- If the all-in-one system is installed in a lightning-prone area, external surge protectors shall be installed at both the PV input terminal and the utility grid input terminal.

NOTICE

- If it is necessary to remove the PV connectors from the all-in-one system, you can insert a removal wrench into the fixed latch and press down firmly to carefully remove the PV connectors.
- If the distance between the PV array and the all-in-one system is relatively long, use thicker wires to reduce voltage drop and improve system performance.

3.7 Connecting the AC loads, Grid and generator

The residual current monitoring unit (RCMU) is integrated into the all-in-one system. When the all-in-one system detects the leakage current is higher than 300mA, it can disconnect from the grid quickly. When the external AC switch has a leakage protection function, its rated leakage protection current is required to be $\geq 300\text{mA}$.



Step 1: Select the appropriate cable type and specification according to [Section 3.3 Port cable description](#). And use wire strippers to strip the insulation layer of the specified cable to a suitable length (as shown in Figure ①).

Step 2: Disassemble the AC terminal in accordance with Figures ②, ③, and ④, and pass the stripped cable through the waterproof locknut.

Step 3: Secure the wire into the locking hole of the terminal as per the markings, and fasten it with an Allen wrench.

DANGER

High voltage! Electric shock hazard! When wiring the AC load, please disconnect the circuit breaker and ensure that the poles' leads are connected correctly.

NOTICE

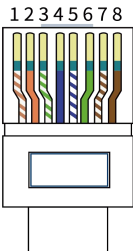
AC equipment shall be selected based on the continuous output power of the all-in-one system. The inrush power of the AC equipment must not exceed the maximum withstand instantaneous inrush power of the system; otherwise, it may cause damage to the energy storage power supply.

3.8 Connecting the communication ports

3.8.1 Meter/CT

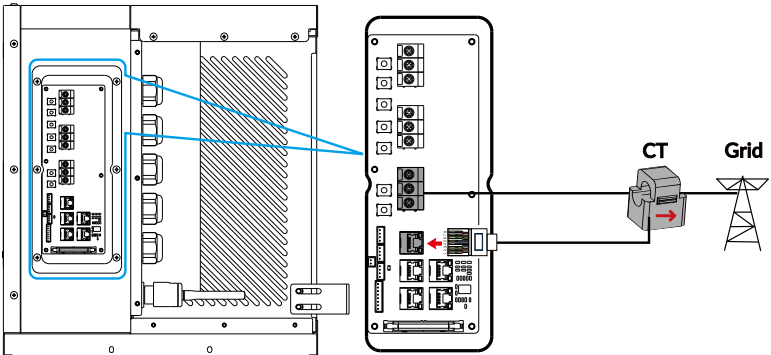
Differences exist in the use of CT/Meter between single-unit systems and multi-unit parallel systems. In a single-unit system, the CT/Meter is applied to the anti-reverse current and the on-grid load. In a multi-unit parallel system, the CT/Meter is applied to the load power rating.

The pins of the Meter/CT port (RJ45) are defined as follows:

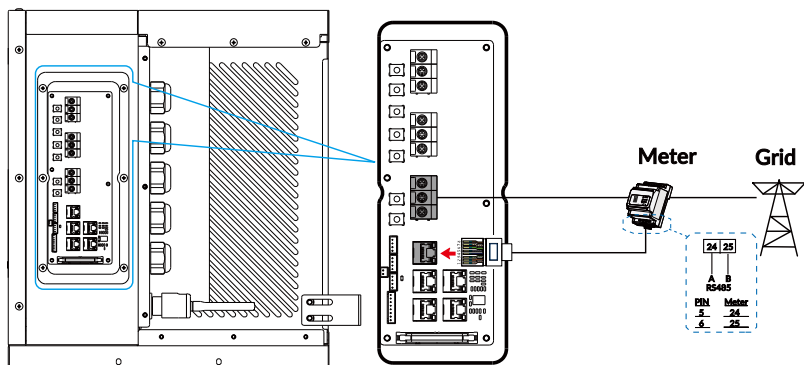
Picture	Pin	Name	Description
	1	CT+	Current transformer output positive pole
	2	CT-	Current transformer output negative pole
	3	Reserved	-
	4	Reserved	
	5	Meter-485A	Meter 485 communication
	6	Meter-485B	
	7	Reserved	-
	8	Reserved	

- For a single-unit system without on-grid load, the following three options are used to achieve the anti-reverse current function: With CT, With Meter, or Without CT and Meter. See schematic diagrams below for details.

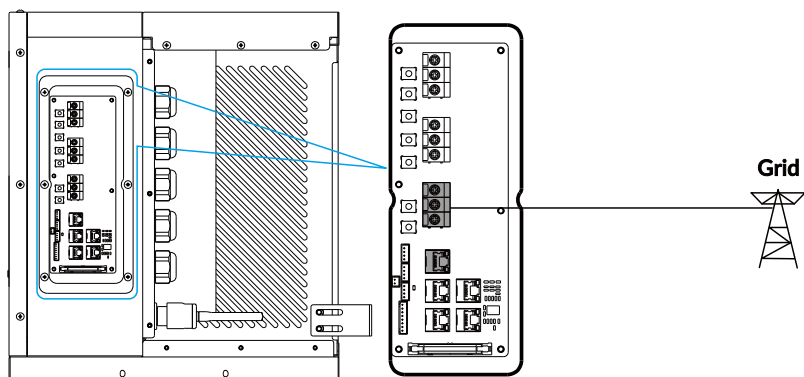
① With CT



② With Meter

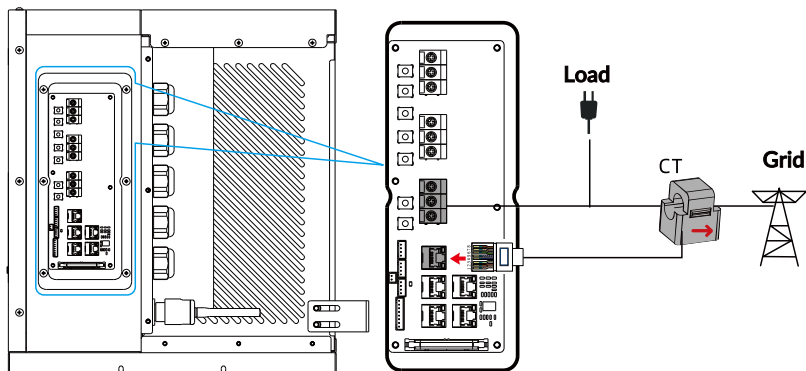


③ Without CT and Meter

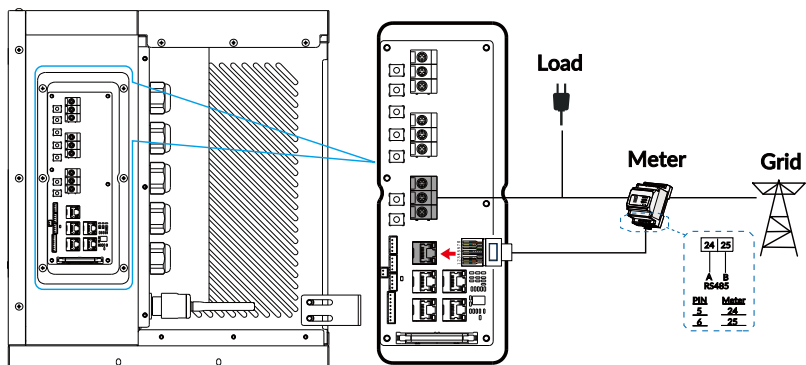


- For a single-unit system with on-grid load, the following two options are used to achieve the anti-reverse current function: With CT, With Meter. See schematic diagrams below for details.

① With CT

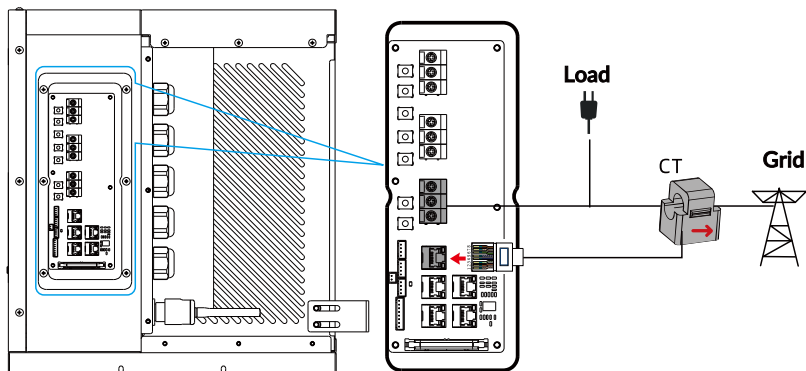


② With Meter

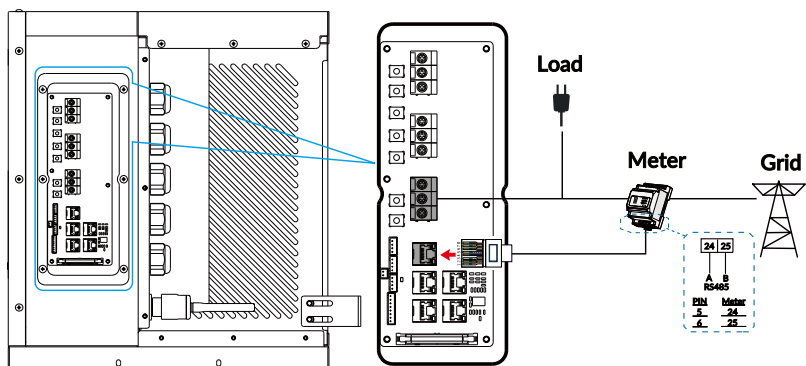


- For a single-unit system with on-grid load, three options are available when there is no anti-reverse current function: With CT, With Meter, or Without CT and Meter. See schematic diagrams below for details.

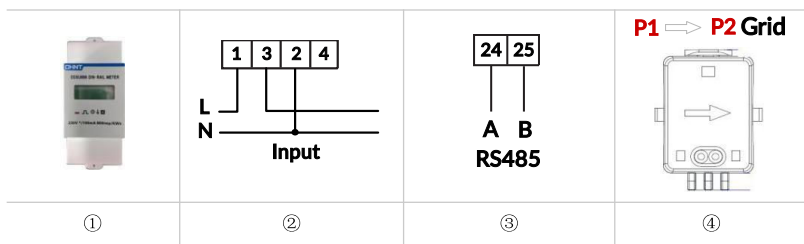
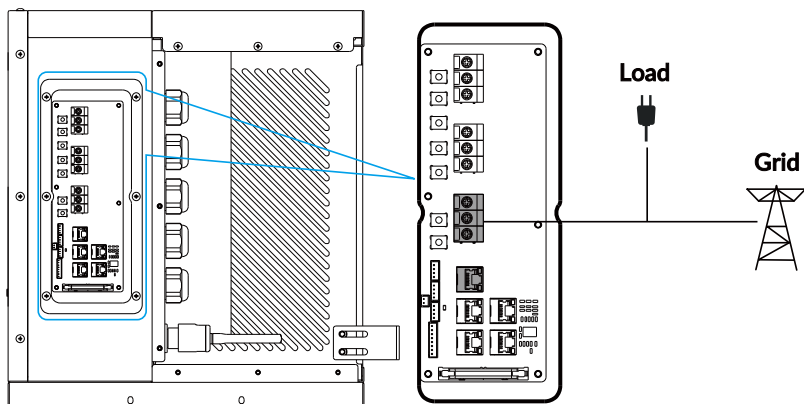
① With CT



② With Meter



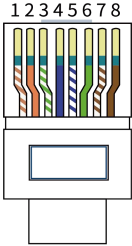
③ Without CT and Meter



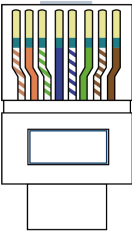
- PIN 5 and PIN 6 of the Meter/CT port on the hybrid inverter are used for electric meter communication. The appearance of the electric meter is shown in Figure ①.
- The electric meter connection method is illustrated in Figure ②: PIN 1, PIN 3, and PIN 2 on the electric meter are connected to voltage signals L (Line) and N (Neutral) respectively.
- PIN 5 and PIN 6 of the Meter/CT port correspond to PIN 24 and PIN 25 of the electric meter, as shown in Figure ③.

3.8.2 COM1/COM2

- The pins of the COM1 port (RJ45) are defined as follows:

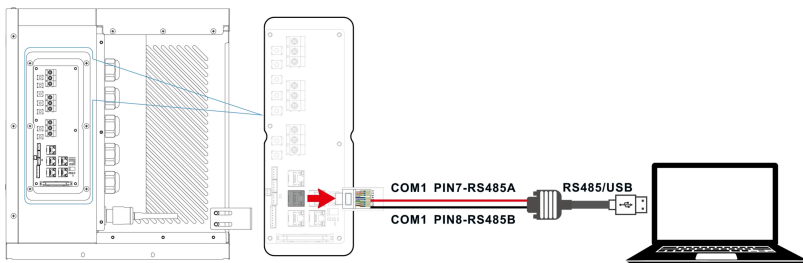
Illustration	Pin	Definition	Description
	1	GND-S	DRM interface
	2	DRMS 1/5	
	3	DRMS 2/6	
	4	DRMS 3/7	
	5	DRMS 4/8	
	6	DRMS 0	Host 485 communication
	7	Monitor-485A	
	8	Monitor-485B	

- The pins of the COM2 port (DG236-5.0-10P) are defined as follows:

Illustration	Pin	Definition	Description
	1	Gen-START-Rly	Generator start/stop dry contact
	2	Gen-START-Rly	Generator back-up dry contact
	3	Gen-ON-Rly	
	4	Gen-ON-Rly	RSD switch input
	5	RSD-IN	
	6	RSD-IN	12V power output
	7	RSD-12V+	
	8	RSD-12V-	

- RS485 (monitoring via cable)

As shown in the figure, connect the RS485+ and RS485- of the hybrid inverter to the TX+ and TX- of the RS485 to USB adapter, and then connect the adapter's USB port to the computer.

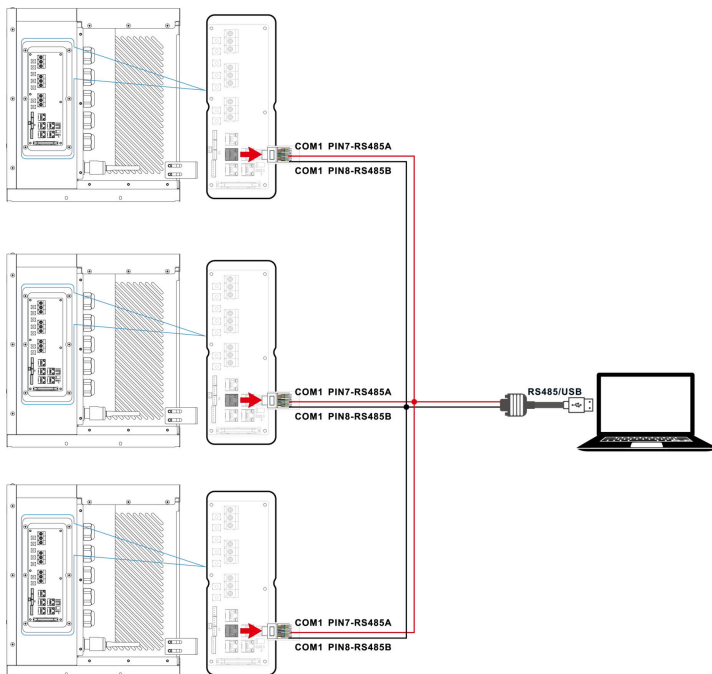


- RS485 (cascade monitoring)

NOTICE

When multiple systems are connected via RS485 communication cables, different communication addresses must be set to distinguish the all-in-one systems.

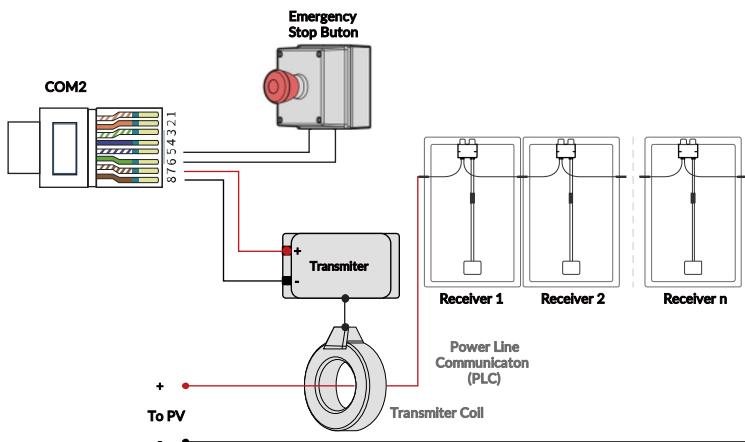
Multiple systems are connected in parallel through RS485 communication cables.



- RSD rapid shutdown and emergency power off

The emergency shutdown pins (PIN5 and PIN6) of COM2 port are normally open contacts, which can trigger a rapid shutdown when closed. The RSD will cut off all power, including the all-in-one system internal power, and stop all AC and DC outputs. The internal 12VDC power supply (PIN7 and PIN8) of the all-in-one system will disconnect the power supply to the RSD transmitter. After pressing the emergency stop button, the RSD transmitter will cut off all input circuits of the solar panels.

- The emergency power off button (normally open) is connected to the PIN5 and PIN6 of COM2 port.
- The RSD transmitter positive (+) and negative (-) terminals are connected to the PIN7 and PIN8 (12VDC power supply) of the COM2 port, respectively.
- Configured the RSD transmitter in the all-in-one system may cause interference in the user area.



NOTICE

- The rated current of the built-in 12VDC power supply (PIN7 and PIN8 of the COM2 port) is 100mA (1.2W). Overloading is strictly prohibited.
- If the rated current of the RSD transmitter exceeds 100mA, please contact the manufacturer before installation.

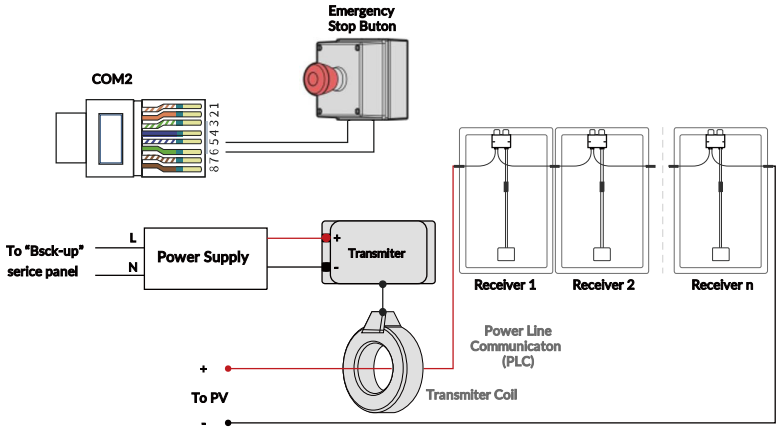
When the rated current of the RSD transmitter exceeds 100mA, an external power converter is needed to power the RSD transmitter. The input of the power converter is connected to the Back-up port of the distribution box. Once the emergency stop button is pressed, all outputs including power to the Back-up port will be shut down. And then, the RSD transmitter will be immediately

turned off.

Recommended RSD transmitter model: APsmart Transmitter-PLC 406001

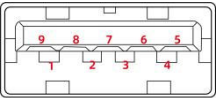
Recommended PV rapid shutdown (receiver) model: RSD-S-PLC

Note: Please select the PV rapid shutdown switch (receiver) based on the actual PV panel model used.

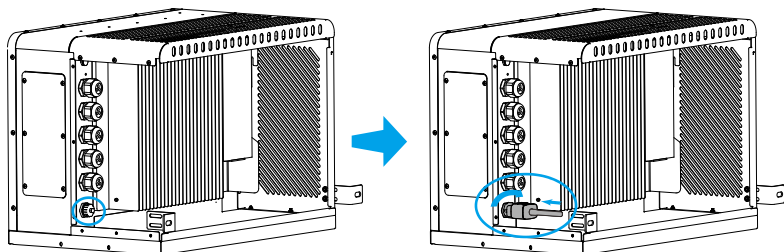


3.8.3 WiFi/GPRS com. port

Connect a USB drive to the WiFi/GPRS com. port for inverter firmware upgrades, or connect a WiFi/GPRS module for inverter remote monitoring. The pins of the WiFi/GPRS com. port (USB-A 3.0) are defined as follows:

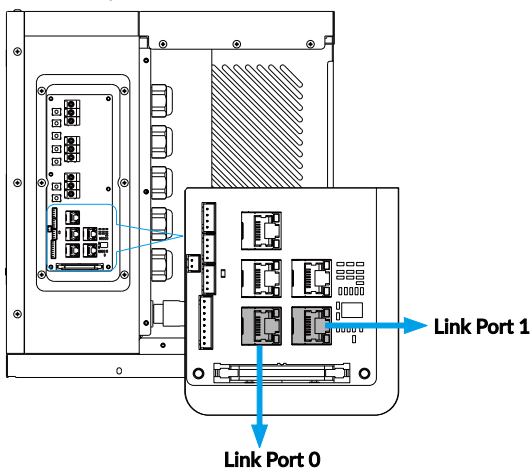
Picture	PIN	USB-A 3.0	Description
	1	+5V	+5V
	2	D-	Data interface
	3	D+	
	4	GND	Power ground
	5	RS485-A	RS485 communication
	6	RS485-B	
	7	Reserved	--
	8	Reserved	--

Connect the WiFi/GPRS com. port



The all-in-one system's operational information (such as power generation, alarms, and operational status) can be uploaded to the server via communication modules like WiFi/GPRS. Users view this information via a WEB interface or an APP, as needed. An account for the WEB or APP is required, and users need to bind the all-in-one system with the serial number of the WiFi/GPRS communication module. The WiFi/GPRS serial number is stuck on both the packaging box and the module itself.

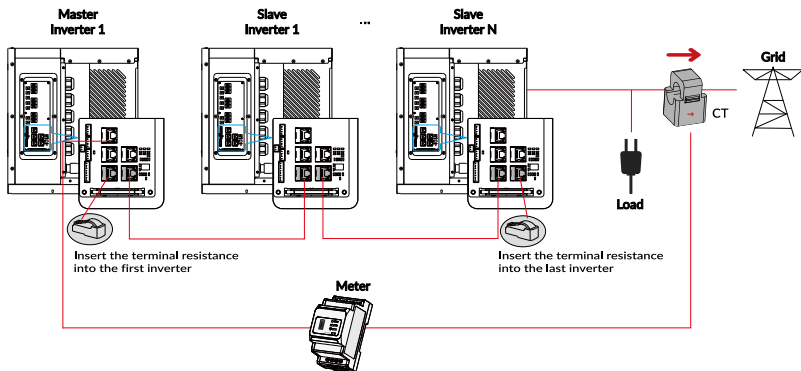
3.8.4 Parallel connection port



In the parallel system, one of the all-in-one systems is set as the master and the others as slaves through APP or monitoring software.

For the scenario where critical load is also connected in parallel under parallel system:

- Connect 8-pin connectors with the Link Port 0 and Link Port 1 on the first and last systems.
- The cable length and specification from the load devices to the AC LOAD terminal of each inverter should be the same to ensure the same loop impedance, thereby ensuring that the load current shunts to each inverter are nearly equal.
- When the load power is greater than the maximum AC LOAD power of the parallel system, the load needs to be connected to the AC GRID terminal (not the AC LOAD terminal). For example, the maximum AC LOAD power of one inverter is 6KW, and the maximum AC LOAD power of six systems is 36KW.



Note: The dedicated parallel operation meter (optional CHINT DDSU666.014 single-phase rail-mounted electricity meter) and the dedicated parallel operation CT (300A) are required. For specific details on the parallel operation, please refer to the “RLS(F) series Parallel Operation Guide” on the EPEVER official website: <https://www.epever.com/products/>.

3.9 Smart port

The Smart port supports multiple application scenarios: when a generator is connected to the GRID port, it functions as a simulated grid; when connected to the GEN (Smart) port, it enables generator supplementation; when a grid-tied inverter or microinverter is connected, it provides AC coupling functionality; and when a load is connected, it operates as a smart load port. When using a generator, the generator overload protection limits needs to be set on the APP according to the specifications of the generator, refer to the “Solarman Business APP Instructions Manual” for the settings of the operation modes and other specific parameters. Besides, the all-in-one system features a 2-wire start/stop control for generators.

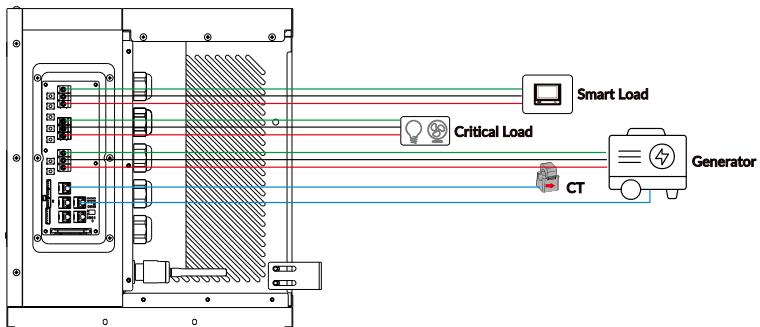
- The scenarios for the four operation modes and wirings for single-unit system are shown below:

① Generator + Critical Load + Smart Load-- Simulated Grid Mode

In this mode, the generator replaces the grid and is connected to the Grid port. It can supply power to the critical load or smart load directly and charge the battery simultaneously. However, the

system cannot feed power back to the generator. Therefore, the Simulated Grid Mode is primarily suitable for self-consumption and peak shaving modes application.

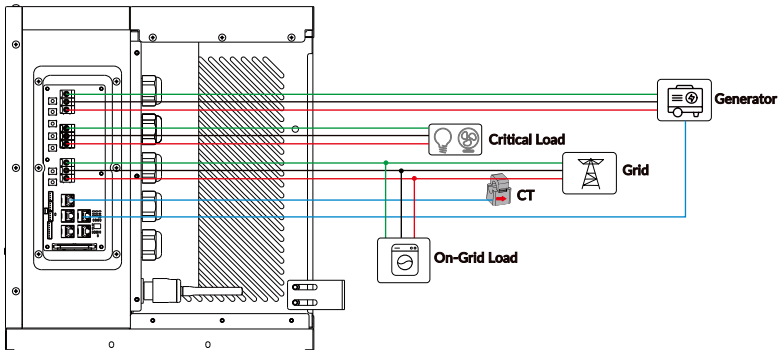
In this mode, connect a generator to the Grid port to replace the grid, the generator can supply power to the critical load or smart load. The generator can be started manually, or it can be started and stopped automatically using the dual-line start/stop control function of the all-in-one system. When using this mode, enable the relaxation for Grid ON Voltage Upper Limit, Grid ON Voltage Lower Limit, Grid ON Frequency Upper Limit, Grid ON Frequency Lower Limit, Overvoltage Protection, Undervoltage Protection, Overfrequency Protection and Underfrequency Protection in the grid voltage protection parameters. If a CT or meter is connected to the power line between the all-in-one system's grid port and the generator, set the "Meter Enable" or "CT Enable" as "Enable" in the APP; if the CT and meter are not connected, set the "Meter Enable" and "CT Enable" as "Disable" in the APP, to avoid the all-in-one system feeding power back to the generator, which may cause generator reverse current protection or even damage.



② Generator + Critical Load + On-Grid Load + Grid -- Recharge Mode

This mode is activated when the grid fails and the battery capacity drops to the discharge lower limit. The generator is started to recharge the battery and supply power to the critical loads.

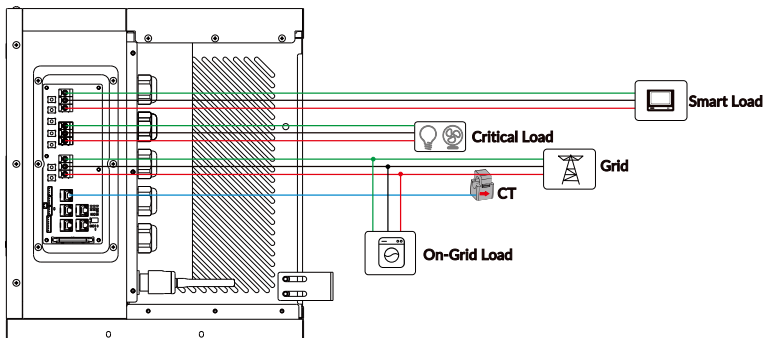
In this mode, connect a generator to the GEN (Smart) port, and connect the generator's dual-line start/stop control line to the generator start dry contacts (pins 1 and 2) of the all-in-one system's COM2 port, then the start and stop of the generator can be controlled automatically. It is necessary to set the Overvoltage Protection, Undervoltage Protection, Overfrequency Protection and Underfrequency Protection according to the characteristics of the generator. When a grid fault occurs, if the battery fault or the SOC is lower than the "Start Battery SOC", the generator is started automatically to supply power to critical loads and recharge the battery. In the recharge status, if the battery SOC exceeds the "Stop Battery SOC" or the grid fault is restored, the generator is turned off automatically and switches back to battery emergency power supply or the previously set ESS mode. The battery charging current is determined by the "Recharge Current Limit" and "Maximum Charging Current Limit". When "Peak Shaving" is enabled, the battery charging and discharging power will be adjusted to ensure the total generator power does not exceed the "Peak Shaving Power".



③ Smart Load + Critical Load + On-Grid Load + Grid -- Smart Load Mode

This mode is specifically designed for applications involving smart loads, which are connected to the GEN (Smart) port. The smart load operates on a priority basis, ensuring that critical loads are powered first. Subsequently, the system determines whether to supply power to the smart load based on the available energy reserves and power distribution capabilities.

The smart load is activated when the lithium battery SOC exceeds the "Start Battery SOC" and the PV power exceeds the "PV Power". The smart load is turned off when the lithium battery SOC is lower than the "Stop Battery SOC" or the PV power is lower than the "PV Power". If "Direct Grid Bypass" is enabled, the smart load is activated when the grid is normal, regardless of the status of the battery and PV. If "Grid Disconnect Off" is enabled, the smart load is turned off when a grid fault occurs, regardless of the status of the battery and PV.

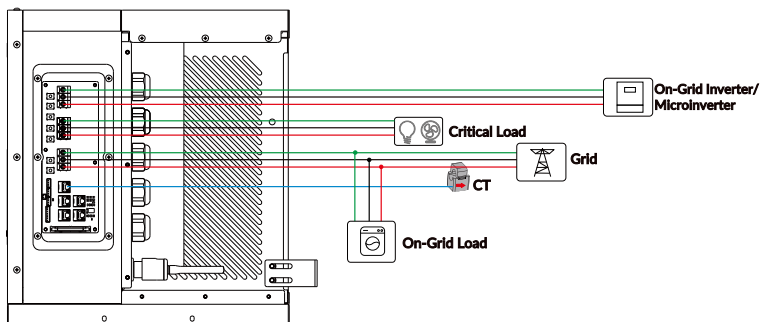


④ On-Grid Inverter/Microinverter + Critical Load + On-Grid Load + Grid: AC Coupling Mode

This mode is compatible with grid-tie inverters or microinverters to achieve efficient energy utilization. The grid-tie inverter or microinverter's grid port needs to be connected to the GEN

(Smart) port, with the AC coupling mode selected.

In this mode, the maximum connectable power of the on-grid inverter or microinverter is 0.5 times the rated power of the all-in-one system. If the lithium battery SOC is lower than the "Start Battery SOC" and rechargeable, the system will output voltage to the GEN (Smart) port to start the on-grid inverter or microinverter. When operating off-grid, the on-grid inverter or microinverter needs to support the F-W function. When the output power of the on-grid inverter or microinverter exceeds the sum of the battery charging power and load power of the all-in-one system, the all-in-one system will adjust the frequency to the "AC-Couple Maximum Frequency" to reduce the power output of the microinverter or turn it off. If the lithium battery SOC exceeds the "Stop Battery SOC" or the power sold to the grid exceeds the set feed-in power, the microinverter will be turned off directly.

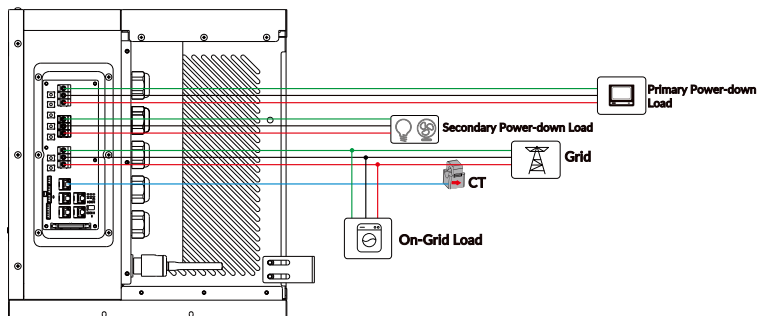


⑤Secondary Power-down Mode in the Pakistani Market

Secondary power-down function settings: Set "Load Start PV Power" to zero. Connect the primary power-down load to the GEN (Smart) port, and connect the secondary power-down load to the Buck-up port. When the battery voltage or SOC is lower than the "Load Off Voltage" or "Load Off SOC", the all-in-one system will turn off the power supply to the primary power-down load, and the Buck-up port will continue to maintain power supply to the secondary power-down load. When the battery voltage or SOC exceeds the "Load Start Voltage" or "Load Start SOC", the all-in-one system will resume power supply to the primary power-down load, and the Buck-up port will continue to maintain power supply to the secondary power-down load.

Enable the "Direct Grid Bypass". When the grid is normal, the primary and secondary power-down outputs are normal, and will not be controlled by battery voltage or SOC. When a grid fault occurs, the current control logic restores, the primary and secondary power-down will be controlled by battery voltage or SOC.

Enable the "Grid Disconnect Off". The primary power-down will be turned off when a grid fault occurs.

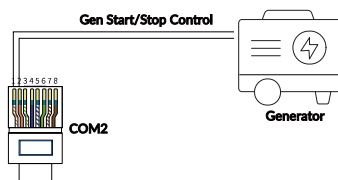


NOTICE

- In the recharge mode, if "Self Diagnostics" is enabled, the generator will be started automatically for a period of time when the set "Week", "Hour" and "minute" are reached, to detect whether the generator status is normal.
- The power of the GEN (Smart) port exceeds the rated power or the "Overload" in the recharge mode, or the power of the GRID port exceeds the "Overload" in the simulated grid mode, the system will shut down for protection.
- In the smart load mode or simulated grid mode, when a smart load is connected to the GEN (Smart) port, the all-in-one system will automatically start or stop outputting power to the GEN port. The power of the smart load on the GEN (Smart) port must not exceed its rated power. The total power of the smart load on the GEN (Smart) port and the critical load on the BACK-UP port is limited to the rated power, overloads are permitted at 1.25 times the rated power for 5 minutes and 1.5 times the rated power for 1 minute.
- In the AC coupling mode, the maximum open circuit voltage of the PV panels should be lower than 500V.

• Two-wire Generator Start/Stop Control Function

The all-in-one system features a built-in circuit for controlling the generator's start and stop. For wiring, connect the two generator start/stop control signals to PIN1 and PIN2 of the COM2 terminal on the all-in-one system respectively. After configuring the generator parameters via the APP, the all-in-one system can automatically start and stop the generator. The detailed wiring diagram is shown below:



4 Operation

4.1 Check before powering on

Please check the following items again before powering on.

- The all-in-one system is securely fixed to the mounting plate.
- The PV cables are securely connected, correctly polarized, and the PV input is within the acceptable voltage range of the all-in-one system.
- The grid and load cables are securely and correctly connected.
- The AC circuit breaker is correctly connected between the all-in-one system grid port and the power grid, and the circuit breaker is disconnected.
- The AC circuit breaker is correctly connected between the all-in-one system load port and the critical load, and the circuit breaker is disconnected.

4.2 Initial powering on

Please follow the steps below to turn on the all-in-one system.

Step 1: Turn on the DC switch.

Step 2: Power on the battery via press the ON/OFF button on the battery pack.

Step 3: Connect the AC circuit breaker between the all-in-one system grid port and the power grid.

Step 4: Connect the AC circuit breaker between the all-in-one system load port and the critical load.

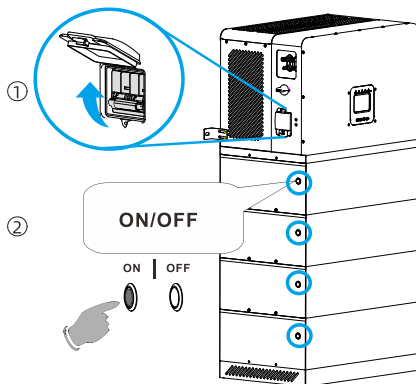
Step 5: The all-in-one system is power-on.

Step 6: Set inverter parameters via the all-in-one system LCD or the Solarman Business APP to ensure it is working normally. The following parameters must be set correctly:

- (1) Select **Safety Code**.
- (2) Select **PV Input Mode** ("Independent" mode by default).
- (3) Select **ESS Mode** ("Self Consumption" by default).
- (4) Remote turn on/off: Select Remote Switching as ON, and click Deliver. To power on the system remotely for grid connecting.

NOTICE

- To avoid arcing at the DC circuit breaker of the inverter, close the inverter's DC circuit breaker first, then turn on the button switch on the battery.
- Each battery pack requires independent actuation via its power-on button to start operation.



4.3 APP settings

Add the WiFi adapter and the connected device to the cloud server by SOLARMAN Business website (<https://cnpro.solarmanpv.com/login>) or APP. Then you will be able to monitor the device and set parameters by PC or APP.

Note: For the details of APP setting, please refer to the “Solarman Business APP Instructions Manual” on the EPEVER official website: <https://www.epever.com/products/>.



4.4 AFCI setup

Causes for arc generation:

- Damage to connectors in PV or battery systems.
- Improper cable connection or breakage.
- Aging of connectors and cables.

Methods for detecting arcs:

- The all-in-one system can be customized to integrate AFCI function and complies with IEC63027.
- When the all-in-one system detects an arc, the user can view the APP to find the arc fault history.
- The all-in-one system will shut down for protection until the AFCI fault is removed. After the AFCI fault is removed, the all-in-one system can automatically reconnect to the grid.
 - Automatic re-connection: If the fault is triggered less than 5 times within 24 hours, the all-in-one system will automatically remove the fault within 5 minutes.
 - Manual re-connection: When the fifth arc fault occurs within 24 hours, the all-in-one system will shut down. Users can remove the faults through the APP, or restart the system after powering off. After the all-in-one system removes the fault, it will reconnect to the grid and operate.

The AFCI function is disabled by default. To enable it via the mobile APP, follow the steps below:

Step 1: Open the parameter setting of the APP and find the AFCI module setting.

Step 2: Read the AFCI parameter values.

Step 3: Enable the AFCI module.

4.5 Display panel

4.5.1 Indicators/Buttons/LCD



a) Indicator

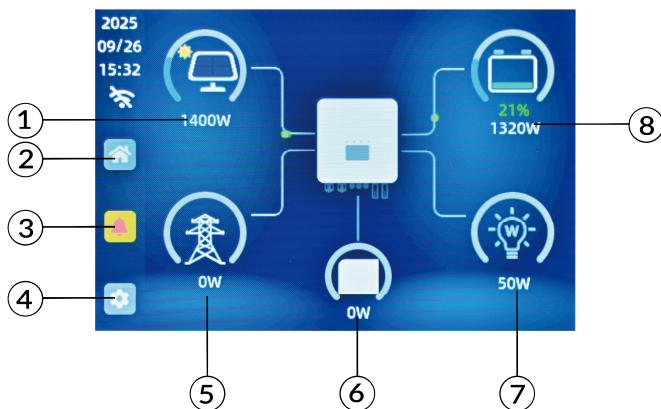
Indicator	Color	Status	Description
STATE	Blue	Slow flashing (2s on 2s off)	Standby
		Fast flashing (1s on 1s off)	Self-test
		Solid ON	Normally running
	Red	Fast flashing (1s on 1s off)	Recoverable faults
		Solid ON	Non-recoverable faults/Upgrade failed
	Pink	Solid ON	Upgrade succeed
BAT	Blue	Solid ON	Battery online
	/	OFF	Battery dropout
COM	Blue	Solid ON	Data sending in Software/IoT
	/	OFF	No data sending in Software/IoT
	Blue	Flashing	Upgrade undergoing
GRID	Blue	Solid ON	Normal grid
	/	OFF	Abnormal grid
BACK-UP	Blue	Solid ON	Normal AC output of emergency load port
	/	OFF	Abnormal AC output of emergency load port

b) Buttons

Buttons	Operation	Instruction
ESC	Press	Exit the current interface
	Press	Move up
	Press	Move down

ENTER	Press	Enters the currently selected interface
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c) LCD



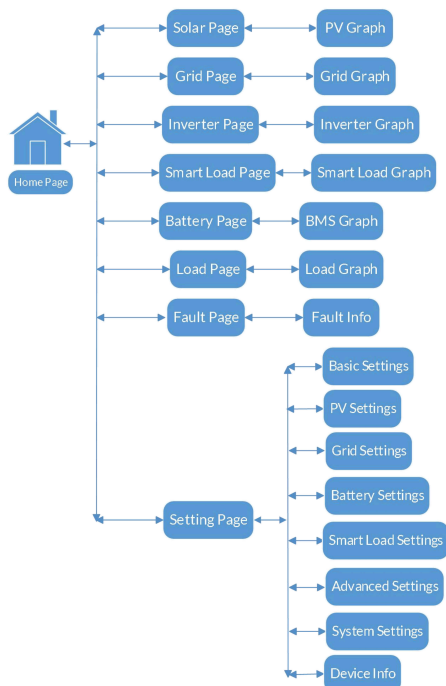
No.	Instruction	No.	Instruction
1	PV power	5	Grid power
2	Home page	6	Smart port power (The displayed power varies based on the configured interface function.)
3	Fault alarms	7	Load total power ⁽²⁾
4	Setting	8	Battery power ⁽³⁾

(1) A positive value indicates purchasing power from the grid; a negative value indicates selling power to the grid.

(2) Refers to the sum of On-Grid Load and Emergency Load power. If no CT or meter is connected, the displayed data shows the Emergency Load power only.

(3) A positive value indicates battery charging; a negative value indicates battery discharging.

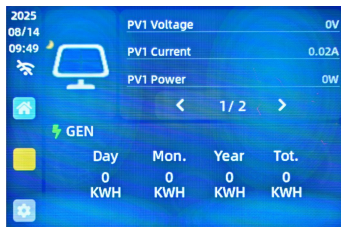
4.5.2 LCD operation flow chart



4.5.3 Real-time parameters

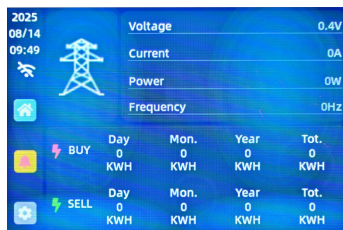
a) PV

From the Home page, tap the PV icon to access the PV data interface. You can view the information of "PV Voltage", "PV Current", "PV Power", and (daily, monthly, yearly, and total) energy generated.



b) Grid

From the Home page, tap the Grid icon to access the Grid data interface. You can view the information of grid's "Voltage", "Current", "Power", "Frequency", and (daily, monthly, yearly, and total) energy purchased and sold.



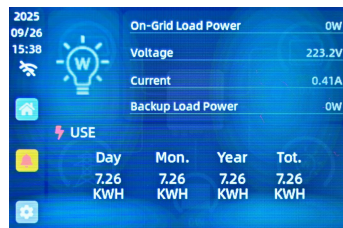
c) Smart Port

From the Home page, tap the Smart port icon to view the information of generator's "Voltage", "Current", "Frequency", "Power" (The displayed power varies based on the configured interface function).



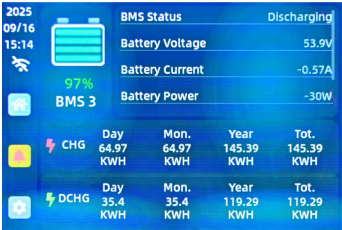
d) LOAD

From the Home page, tap the Load icon to access the Load data interface. You can view the information of "On-Grid Load Power", "Voltage", "Current", and "Backup Load Power".

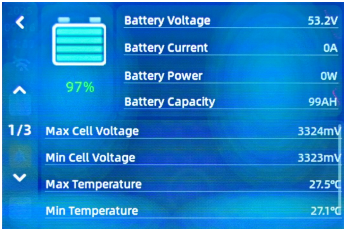


e) Battery

From the Home page, tap the Battery icon to access the Battery data interface. You can view the information of "BMS Status", "Battery Voltage", "Battery Current", "Battery Power", as well as (daily, monthly, yearly, and total) charged and discharged power.



Tap the BMS3 icon to enter the pack display interface. Use the up and down scroll icons on the left to browse through the battery pack information.



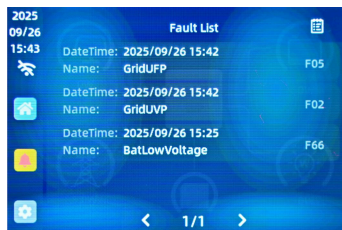
f) Inverter

From the Home page, tap the all-in-one system icon to access the all-in-one system data interface. You can view the information of "Rated Power", "Device Model", "On-Grid Countdown", "Operating Status", "SN", "Safety Standard", and "ESS Mode".



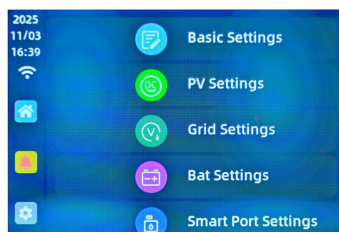
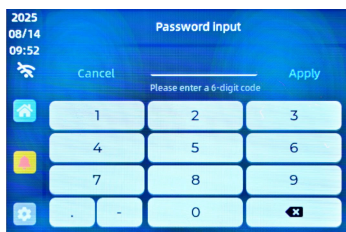
g) Faults

From the Home page, tap the Fault icon to access the "Fault List" interface where you can view the all-in-one system's fault information.



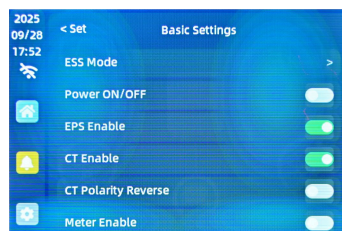
4.5.4 Parameter settings

From the Home page, tap the Settings icon and enter the correct password to access the Settings interface.



a) Basic Settings

Users can configure the following inverter parameters based on their needs: "ESS Mode", "Power ON/OFF", "EPS Enable", "CT Enable", "CT Reverse", "Meter Enable", "Meter-CT Ratio", "Zero Power Calibration", "Overload Protection Enable", "Feed-in Power Limit Enable", "Feed-in Power Limit".



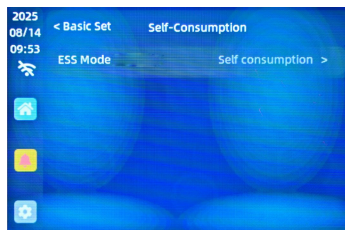
No.	Item	Description
1	ESS Mode	Select and configure the system's operating mode.
2	Power ON/OFF	Controls device operation. After configuring parameters, ensure this setting is turned ON; otherwise, the device

		will remain in standby mode.
3	EPS Enable	Controls the emergency power function. When enabled, the system will switch to emergency power supply mode (off-grid mode) during a grid outage, powered by the battery and PV for backup loads.
4	CT Enable	Controls the CT functionality. Enable this item if the CT is directly connected to the device; otherwise, disable it.
5	CT Reverse	Reverses the CT measurement direction. If the CT is installed in the wrong orientation, enable it to automatically correct the power flow reading. This setting is only active when "CT Enable" is ON.
6	Meter Enable	Controls the meter interface. Enable this if a meter is connected to the device; otherwise, disable it.
7	Meter-CT Ratio	Set this parameter according to the actual CT ratio if both a meter and its associated CT are connected to the device. This setting is only active when "Meter Enable" is ON.
8	Zero Power Calibration	Sets a zero-feed-in power threshold, representing grid export power. It is recommended to set this between 0-500W to prevent the hybrid inverter from feeding power to the grid.
9	Overload Protection Enable	Enables grid feed-in over-power protection. When enabled, the unit will enter standby mode if the grid feed-in power exceeds the set value.
10	Feed-in Power Limit Enable	Enables the grid feed-in power limiting function.
11	Feed-in Power Limit	Sets the maximum allowable grid feed-in power. During operation, the system will ensure that power fed back to the grid does not exceed this value.

Navigate to the "ESS Mode" option in the "Basic Settings" menu to configure the all-in-one system's operating mode. For a detailed explanation of the operational logic for each operating mode, please refer to the Section [1.4 Energy Storage System \(ESS\) modes](#).

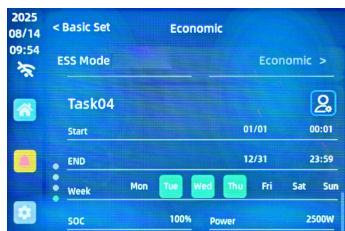
1. Self-consumption Mode

In this mode, the all-in-one system automatically charges and discharges the battery.



2. Economic Mode

Electricity is more expensive during high-demand periods and cheaper during low-demand periods. You can select an off-peak period to charge your battery. Outside the off-peak charging period, the all-in-one system operates in Self-consumption mode. To enable this feature, click the person icon on the right and wait for it to light up. Up to 4 rules (Rule 1/2/3/4) can be configured to accommodate complex requirements.



3. Time of Use Mode

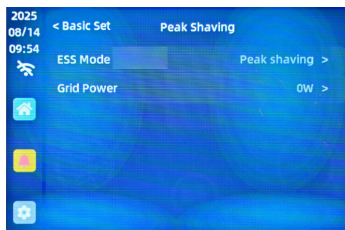
The system controls battery charging and discharging based on user-defined time periods and power settings. Outside these scheduled periods, the all-in-one system operates in self-consumption mode. You can configure up to 4 charge/discharge time periods to accommodate complex requirements.

Note: Time of Use Mode is only permitted where local regulations allow, and is recommended for scenarios with significant peak/off-peak electricity price differentials.

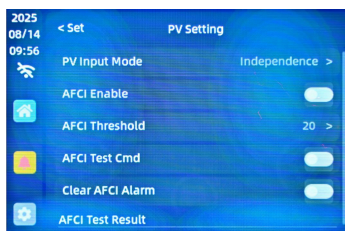


4. Peak Shaving Mode

Users can set a maximum power limit for purchasing electricity from the grid. During periods of high load consumption, the all-in-one system restricts grid power purchase, with any shortfall being supplemented by PV generation and battery discharge to alleviate local grid load. During periods of low load consumption, the all-in-one system initiates grid power purchase to charge the battery while simultaneously supplying the load from the grid.



b) PV Settings

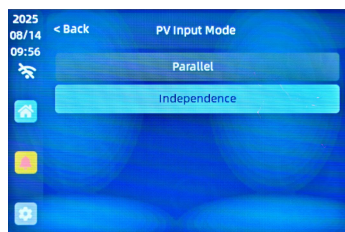


1. PV Input Mode

"Parallel" or "Independence" mode available.

Parallel: Both PV input ports of the inverter are connected to the same power source.

Independence: The two PV input ports of the inverter are connected to two separate, independent power sources.



2. AFCI Enable

When AFCI is enabled, the all-in-one system activates the DC arc fault protection function.

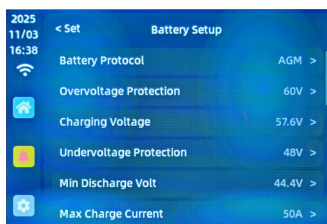
c) Grid Setting

Users can configure parameters such as "Safety Standard", "Reconnect Parameter", "Voltage Protection Settings", "Frequency Protection Settings", and "Italy Self-Test".

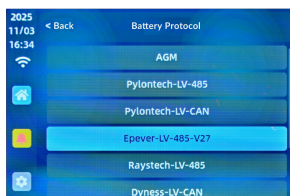


d) Bat Settings

Users can set parameters including "Battery Protocol", "Overvoltage Protection", "Charging Voltage", "Undervoltage Protection", "Min Discharge Volt", "Max Charge Current", "Max Discharge Current", "DOD(OnGrid)", "DOD(OffGrid)", "Battery Capacity", "Batt Auto Activate", "Batt Manual Activate", "Activation Voltage", and "Discharge Hysteresis" based on battery information.



1. Select the correct battery protocol according to the installed battery model. **Note:** For supported battery protocols, please refer to *EPEVER Inverter-Battery Protocol Compatibility List* at the Epever website.



2. "Batt Protocol Detect": The all-in-one system automatically identifies battery information through the BMS communication protocol, helping users quickly recognize battery model, manufacturer information, software version, and battery serial code. These parameters can only be read and displayed if supported by the battery BMS. Parameters may not be displayed or fully shown if the battery BMS does not contain this information.



3. "Batt Auto Activate" and "Batt Manual Activate": When the customer enables the auto-activation function, the all-in-one system will automatically activate a sleeping battery based on its communication protocol under PV power generating and grid power supplying operation. If the battery enters a sleep mode where external communication is disabled, the manual activation function can be enabled. Once the battery is activated, the all-in-one system will automatically initiate a supplementary charging process.

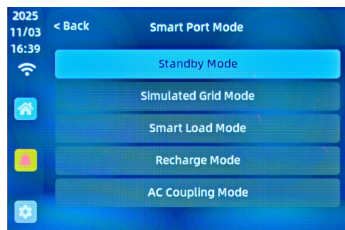


NOTICE

- Battery settings are pre-configured at the factory with default values and require no further setup.
- "Batt Auto Activate" is disabled by default on power-up. Enable manually as needed.

e) Smart Port Settings

The "Smart Port Mode" can be set to one of five working modes: "Standby", "Simulated Grid", "Smart Load", "Recharge", and "AC Coupling".



1. Standby Mode

In Standby mode, the smart port function is disabled.

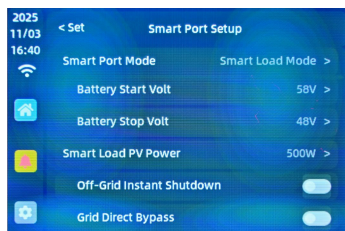
2. Simulated Grid Mode

In Simulated Grid mode, the generator is connected to the Grid port, and the all-in-one system automatically enables anti-backfeed protection to prevent current from flowing back to the generator, thus avoiding overvoltage protection triggers and enabling smart load/PV power coordination. Users can configure “Auto Detection” settings, including automatic detection of the week, hour, minute, and duration.



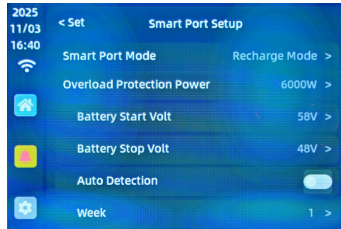
3. Smart Load Mode

In Smart Load mode, the smart load is connected to the Smart port. The all-in-one system supplies power to the smart load only when both battery and PV power meet the required conditions. Users can set parameters such as "Battery Start SOC", "Battery Start Volt", "Battery Stop SOC", "Battery Stop Volt", and "Smart Load Start PV Power".



4. Recharge Mode

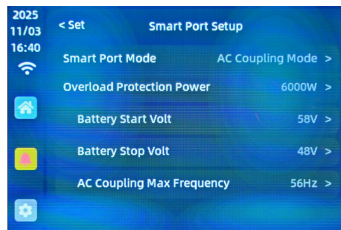
In Recharge mode, the generator is connected to the Smart port, enabling direct charging of the battery while simultaneously supplying power to critical loads. Users can configure parameters including "Battery Stop SOC", "Battery Stop Volt", "Auto Detection", "Week", "Hour", "Peak Shaving Power", "Recharge Overvoltage Protection", "Undervoltage Protection", "Overfrequency Protection", and "Underfrequency Protection".



5. AC Coupling Mode

In AC Coupling mode, users set the "Battery Start SOC" or "Battery Start Volt" to activate AC coupling, and the "Battery Stop SOC" or "Battery Stop Volt" to deactivate it.

The off-grid maximum frequency is also configurable to limit the output frequency. By increasing the off-grid voltage frequency, the all-in-one system adjusts micro-inverters or grid-tied inverters to reduce their input power (which may cause them to exit operational mode), ensuring system stability.



f) Advanced Settings

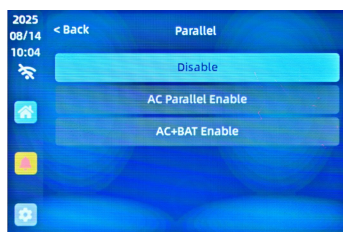
Configure single-phase parallel operation, three-phase grouping, and IV Scan Interval parameters.

The "Parallel Address" is automatically assigned by the system and does not require manual configuration.



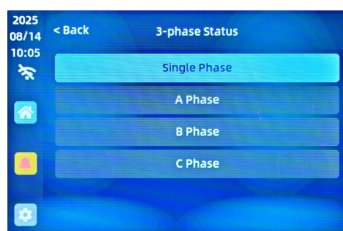
1. Parallel setup

Set "Parallel" to "AC Parallel Enable".



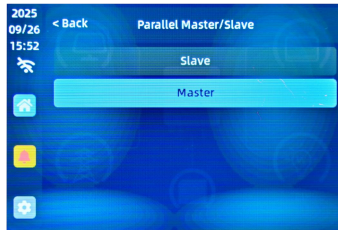
2. 3-phase Status setup

For single-phase parallel systems, set the all-in-one system to "Single Phase". For three-phase systems, assign each inverter to "A Phase", "B Phase", or "C Phase".



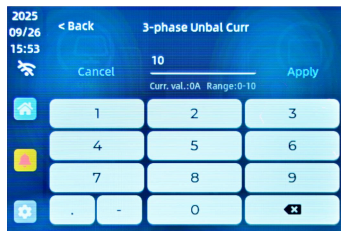
3. Parallel Master/Slave setup

In single-phase parallel systems, set one system as "Master" and others as "Slave". In three-phase systems, assign "Master" and "Slave" units for each phase (A, B, and C).



4. 3-Phase Unbal Curr setup

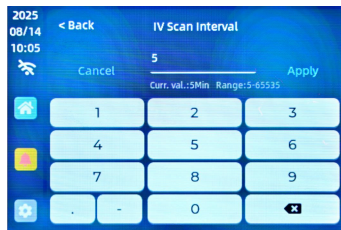
When enabled, the all-in-one system will trigger a protection alarm if the current difference between any two phases exceeds the set value.



NOTICE

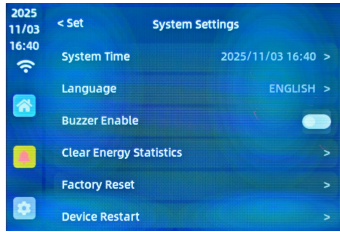
- Single-phase parallel systems must have exactly one Master unit.
- Three-phase systems require one Master unit per phase (A, B, C).

5. IV Scan Interval setup



g) System Settings

Users can configure "System Time", "Language", "Buzzer Enable", "Clear Energy Statistics", "Device Restart" and "Factory Reset".



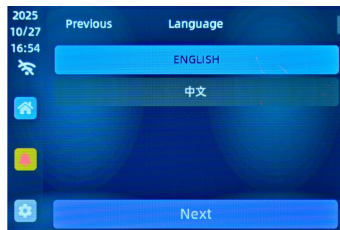
1. After setting the system time, tap "OK" to save.
2. With the buzzer enabled, it will sound an alarm when a warning or fault occurs.
3. Tap "Clear Energy Statistics" to delete all energy statistics.
4. Click "Device Restart" to reboot the unit without power cycling.
5. Tap "Factory Reset" to restore the all-in-one system to its original default configuration.

Operation steps for "Factory Reset":

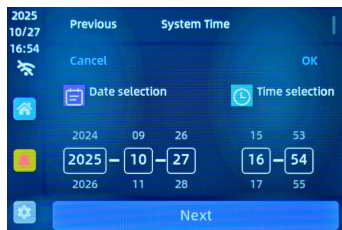
Step 1: Upon clicking "Factory Restore", the following screen will appear. Tap "OK" to proceed to the language selection interface.



Step 2: Select the language you need, and tap "Next" to set the system time.



Step 3: Set and adjust the system time to the correct local time, then tap "Next".



Step 4: Select the appropriate safety standard according to your local regulations, then tap "Next".



Step 5: Choose the correct battery protocol based on the battery currently in use. Finally, tap "END" to complete resetting.



h) Device Info

View details including "Available Updates", "Remote Upgrade", "HW Version", "ARM Version", "M_DSP Version", "S_DSP Version", and "BMSLink Version".



5 Maintenance

5.1 All-in-one system powering off

Step 1: Disconnect the AC circuit breaker on the Grid input side.

Step 2: Disconnect the AC circuit breaker on the Back-up output side.

Step 3: Turn off the battery ON/OFF button.

Step 4: Turn off the DC switch of the all-in-one system.

5.2 All-in-one system disposal

When the all-in-one system can no longer be used and needs to be discarded, please dispose of the all-in-one system in accordance with the electrical waste disposal requirements specified by the current country/region. The all-in-one system should not be treated as household waste.

5.3 Routine maintenance

The system generally requires no maintenance or calibration, but it is important to ensure that the heat sinks are not covered by dust, dirt, or other debris.

- **Clean system**

Please clean the all-in-one system using an electric compressed air blower, a dry soft cloth, or a soft-bristled brush. Do not use water, corrosive chemicals, cleaning agents, or strong detergents to clean the all-in-one system.

- **Clean heat sink**

To ensure the normal function and long-term use of the all-in-one system, it is crucial to maintain sufficient airflow space around the heat sink. No obstructions to airflow, such as dust or snow, should be present around the heat sink and must be removed. Clean the heat sink using compressed air, a soft cloth, or a soft brush. Do not use water, corrosive chemicals, detergents, or strong cleaning agents to clean the heat sink.

6 Troubleshooting

Verify the fault cause by checking the status of the all-in-one system indicators (refer to Section [4.5.1 Indicators/Buttons/LCD](#) for fault cause identification), accessing the alarm information within the APP (on the APP's main screen, select "Site > Device List", click on a device to access its relevant information page, and then click "Alarm Messages" to view the fault details), or viewing the fault list interface on the LCD. Then, refer to the error information and solutions provided in the table below to try to resolve the fault.

If the all-in-one system indicator, APP, or LCD interface does not display any error information, please refer to the following to see if the current installation status meets the requirements for the all-in-one system to work properly. If not, make the right adjustments and then check if the fault has been solved.

- Check whether the all-in-one system is installed in a clean, dry and well-ventilated location. Dampness and poor ventilation may cause adverse effects on the operation of the device.
- Check whether the DC switch is in the ON position. If it is in the OFF position, it may affect the normal start-up and operation of the device.
- Check whether the cross-section and length of the cable meet the requirements. Inappropriate cable specifications may lead to abnormal current transmission and thus trigger faults.
- Check whether the input, output connections and wiring are in good condition to ensure that there are no loose connections, short circuits, etc., and to guarantee stable and reliable circuit connections.
- For specific installations by users, confirm whether the configuration settings are correct. Incorrect configurations may prevent the all-in-one system from operating as expected.
- Check whether the display panel and communication cable are correctly connected and undamaged. If the connection is improper or the cable is damaged, it may result in the inability to display or transmit information normally.

If you still need assistance after above operations, please contact the after-sales service center.

The error information and solutions are as follows:

ID	Failure	Solution
1	GridOVP (Grid Over Voltage)	If it occurs occasionally, it may be occasional abnormalities in the power grid. After the power grid returns to normal, the all-in-one system will automatically resume working.
2	GridUVP (Grid Under Voltage)	If it occurs frequently, check whether the grid

3	VGridLineFault (Grid Line Voltage Error)	voltage/frequency is within the specified range of the all-in-one system.
4	GridOFP (Grid Over Frequency)	- If the grid voltage/frequency is within the specified range of the all-in-one system, check the all-in-one system's AC circuit breaker and AC wiring. - If the grid voltage/frequency is not within specified range and the AC wiring is correct, but there are still multiple alarms, contact technical support to adjust the grid over/under voltage and over/under frequency protection values.
5	GridUFP (Grid Under Frequency)	
6	OVRT (Over Voltage Ride Through Error)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
7	LVRT (Low Voltage Ride Through Error)	
8	IslandFault (Island Fault)	
11	Wire Sequence Error	When multiple systems are connected in parallel, check whether the wire sequence of the grid or generator port (A/B/C/N) between the master system and slave systems is correct.
17	GEN_OVP (Generator Over Voltage)	Check whether the generator is working normally.
18	GEN_UVP (Generator Under Voltage)	
19	GEN_OFP (Generator Over Frequency)	
20	GEN_UFP (Generator Under Frequency)	
21	GEN_OverLoad (Generator Overload)	
22	GEN_RefluxOverLoad (Generator Anti-reflux Overload)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact
23	Overload1	
24	Overload2	
25	Overload3	
26	InvVoltFault (Inverter Voltage Fault)	

27	SwInvInstantOVP (Inverter Peak Over Voltage)	our technical support.
28	SwAcRmsOCP(Inverter RMS Over Current)	
29	SwAcOCPIInstant (Inverter Peak Over Current)	
30	HwAcOCP (Inverter Hardware Over Current)	
31	IacUnbalance (Inverter Current Unbalance)	
32	DciOCP (Inverter DC Component Over Current)	
33	HwADFaultVAC (AC Side Voltage Reference Error)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
34	HwADFaultIAC (AC Side Current Reference Error)	
35	HwADFaultIdc (DC Side Current Reference Error)	
36	HwADFaultDCV (Inverter Voltage DC Component Reference Error)	
37	HwADFaultDCI (Inverter Current DC Component Reference Error)	
38	HwADFaultVGrid_Slave (Slave Chip Grid Voltage Reference Error)	
39	GFCIDeviceFault_Slave (Slave Chip Leakage Current Sampling Error)	
40	ConsistentFault_Vgrid (Grid Voltage Inconsistency)	
41	ConsistentFault_DCI (Inverter Current DC Component Inconsistency)	
42	ConsistentFault_GFCI (Leakage Current Inconsistency)	
43	GFCIDeviceFault (Leakage Current	

	Sampling Error)	
44	GFCI (Leakage Current Fault)	
45	CTDisconnect (CT Current Error)	Check whether the CT connection is correct.
46	SwGridRmsOCP (Grid RMS Over Current)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
47	RefluxOverLoad (Anti-backfeeding Overload)	
48	RelayFail (Bypass Relay Error)	
49	SwBusOVP (Bus Average Over Voltage)	
50	SwBusInstantOVP (Bus Peak Over Voltage)	
51	HwBusOVP (Bus Hardware Over Voltage)	
52	BusUVP (Bus Undervoltage During Grid Connection)	
53	BusZVP (Bus Low Voltage)	
59	LLCBusOVP (LLC Bus Over Voltage)	
60	HwLLCBusOVP (LLC Bus Hardware Over Voltage)	
66	BatLowVoltageShut (Battery Low Voltage Shutdown)	Check whether the battery voltage is too low.
67	SwBatOCP (Battery Over Current)	Check whether the all-in-one system is working overload.
68	HwBatOCP (Battery Hardware Over Current)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
69	SwBuckBoostOCP (BuckBoost Peak Over Current)	
70	HwBuckBoostOCP (BuckBoost Hardware Over Current)	
73	PvOVP (PV Over Voltage)	
74	SwPvOCPIstant (PV Peak Over Current)	

75	HwPVOC (PV Hardware Over Current)	
76	IpvUnbalance (PV Current Unbalance)	
77	PVConfigError (PV Mode Settings Error)	Check the setting of the PV input mode (parallel/single mode). Modify the settings if it is not corresponding to the actual PV input method.
81	IsoFault (Insulation Resistance)	Check the insulation resistance between the PV array and ground (earth). If a short circuit occurs, repair the fault in time.
82	PEConnectFault (Grounding Error)	Check the grounding of the PE line for the AC output.
83	AFCIFault (AFCI Fault)	Check the PV input wiring for any loose connections or arcing.
84	AFCIDeviceFault (AFCI Module Fault)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
89	SpiCommFault_DC (SPI Communication Error (DC))	
90	SpiCommFault (Master-Slave SPI Communication Error)	
91	SChip_Fault (Slave Chip Error)	
92	MChip_Fault (Master Chip Error)	
93	SciCommLose (SCI Communication Error)	
94	MeterCommLose (Electric Meter Communication Fault)	Check whether the communication cable of the electric meter is properly connected.
95	AFCICommFault (AFCI Communication Fault)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
96	ParallelFault (Parallel Error)	Check whether the parallel connection cable is in good contact.

97	FanFault (Fan Fault)	Check whether the fan 1 of the all-in-one system is working normally.
98	TempFault_Env1 (Ambient Temperature Over Temperature 1)	Ensure the all-in-one system is installed in a cool, well-ventilated area (do not install the all-in-one system in direct sunlight).
99	TempFault_Env2 (Ambient Temperature Over Temperature 2)	
100	TempFault_Inv1 (Module 1 Over Temperature)	
101	TempFault_Inv2 (Module 2 Over Temperature)	
102	TempFault_Inv3 (Module 3 Over Temperature)	
105	TempFault_Bat (Battery Over Temperature)	
106	TempFault_HeatSink1 (Heat Sink 1 Over Temperature)	
113	VoltDerating (Voltage Derating)	Ensure the grid voltage and frequency are within the specified range of the all-in-one system.
114	VoltLoading (Voltage Loading)	
115	FreqDerating (Frequency Derating)	
116	FreqLoading (Frequency Loading)	
117	OverTempDerating (Over Temperature Derating)	Ensure the all-in-one system is installed in a cool, well-ventilated area (do not install the all-in-one system in direct sunlight).
118	BatLowVoltageAlarm (Battery Low Voltage Alarm)	Check whether the battery voltage is too low.
119	ReversalConnection (PV Input Reverse Connection Alarm)	Check whether the positive and negative poles of the PV input cable are reversed.
121	Generator Self-Test Abnormal	Check whether the wiring between the generator and dry contact is abnormal, and whether the generator can work normally.
122	ParalleComFault (Parallel Communication Fault Alarm)	Check that there is only one master unit for each phase, the wiring is normal, and the number of paralleled units does not exceed

		nine. 1. Whether the communication cable is connected normally. 2. Synchronization signal reception failed. 3. The number of paralleled units exceeds the limit. 4. Whether there is no master unit or multiple master units in the setting of each phase.
123	Phase abnormal	Check whether any other faults occur in the single unit of each phase in the three phase system, which may cause phase loss of the system. 1. Phase loss 2. Abnormal phase setting 3. The phase angles and phase differences of AB, BC, and CA deviate from 120 degree or 180 degree
125	Current unbalance in three phase	After enabling the unbalanced support in the three phase system, the current difference between the outputs of any two phases exceeds the set value of "Unbalance Current Value". Ensure that the current difference between the outputs of any two phases does not exceed the set value of "Unbalance Current Value", or increase the set value of "Unbalance Current Value", or select "Disable unbalanced support".
128	Current sharing abnormal	Check whether the outputs of all parallel-connected devices in the system are correctly connected together. Ensure that all the output circuit breakers of the parallel-connected devices are closed.
129	unrecoverPvConfigError (PV Mode Settings Permanent Fault)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
130	unrecoverPVOCPIInstant (PV Over Current Permanent Fault)	
131	unrecoverHwPVOC (Hardware PV Over Current Permanent Fault)	

132	unrecoverRelayFail (Grid Relay Permanent Fault)	
133	unrecoverVbusUnbalance (Bus Unbalance Permanent Fault)	
134	unrecoverOverLoad (Overload Permanent Fault)	
137	unrecoverHwAcOCP (Hardware Inverter Over Current Permanent Fault)	
138	unrecoverBusOVP (Bus Over Voltage Permanent Fault)	
139	unrecoverHwBusOVP (Bus Hardware Over Voltage Permanent Fault)	
140	unrecoverIpvUnbalance (PV Current Unbalance Permanent Fault)	
141	unrecoverEPSBatOCP (EPS Battery Over Current Permanent Fault)	
142	unrecoverAcOCPInstant (Inverter Peak Over Current Permanent Fault)	
143	unrecoverIacUnbalance (AC Current Unbalance Permanent Fault)	
144	unrecoverAFCIFault (AFCI Permanent Fault)	
145	BMSOVP (BMS Over Voltage Alarm)	This is an internal fault of the lithium battery. Please turn off the all-in-one system and lithium battery, and then turn them back on after waiting for 5 minutes to check if the fault disappears. If the issue remains unresolved, please contact our technical support.
146	BMSUVP (BMS Under Voltage Alarm)	
147	BMSOTP (BMS High Temperature Alarm)	
148	BMSUTP (BMS Low Temperature Alarm)	
149	BMSOCP (BMS Charging/Discharging Over Current)	
150	BMSShort (BMS Short Circuit Alarm)	If the upgrade fails, make multiple times of plugging and unplugging or perform a re-upgrade after powering on. If the issue remains
161	ARM update Fail (ARM Update Failed)	
162	DSP-M update Fail (Master DSP Update Failed)	

163	DSP-S update Fail (Slave DSP Update Failed)	unresolved, please contact our technical support.
164	BMSLink update Fail (BMSLink Update Failed)	
171	Drms0Shutdown (Drms0 Shutdown)	The all-in-one system is shut down via Drms0.
177	USBFault (USB Fault)	Check the all-in-one system USB port.
178	WifiFault (WiFi Fault)	Check the WiFi connection of the all-in-one system.
179	BluetoothFault (Bluetooth Fault)	Check the Bluetooth connection of the all-in-one system.
180	RTCFault (RTC Fault)	This is an internal fault of the all-in-one system. Please turn off the all-in-one system, and then turn it back on after waiting for 5 minutes to check if the fault disappears.
181	EEPROMFault (EEPROM Error)	
182	FlashFault (FLASH Error)	
184	SafetyVerFault (Safety Version Error)	
185	SCILose(DC) (SCI Communication Error (DC))	
186	SCILose(AC) (SCI Communication Error (AC))	If the issue remains unresolved, please contact our technical support.
189	BMSCommFault (Battery Communication Fault)	Ensure that the batteries you use are compatible with the all-in-one system. CAN communication is recommended. Check for any faults in the communication cables or ports between the battery and inverter.
190	RsdFault (RSD Fault)	Check whether fast shutdown occurs.

7 Technical Specifications

7.1 ERS Series On-Grid Hybrid Inverter

Model	ERS 3042	ERS 3642	ERS 4042	ERS 4642	ERS 5042	ERS 6042
Battery (DC)						
Battery Type	LFP					
Voltage Range	42V-63V					
Charging Rule	BMS command					
Maximum Charging and Discharging Current	75A	80A	85A	100A	110A	120A
PV Input (DC)						
Maximum Input Power	4,500W	5,400W	6,000W	6,900W	7,500W	9,000W
Maximum Input Voltage	580V					
Start-up Voltage	100V					
Rated Input Voltage	360V					
Maximum Input Current per MPPT	16A					
Short-circuit Current per MPPT	19.2A					
MPPT Voltage Range	100V-550V					
Number of MPPTs	1		2			
Number of Strings per MPPT	1					
Generator Input (AC)						
Rated Input Power	3,000W	3,680W	4,000W	4,600W	5,000W	6,000W
Rated Input Current	13.1A	16A	17.4A	20A	21.7A	26A

Rated Input Voltage	230V					
Rated Input Frequency	50/60Hz					
AC Output (On-grid)						
Maximum Output Apparent Power	3,300VA	4,050VA	4,400VA	5,060VA	5,500VA	6,600VA
Maximum Output Current	14.3A	17.6A	19.1A	22A	23.9A	28.6A
Maximum Input Current From Grid	28.6A	35.2A	38.2A	43A	47.8A	55A
Rated Grid Voltage	220/230/240V (L/N/PE)					
Rated Grid Frequency	50/60Hz					
THDi	< 3%					
Power Factor	About 1 (Adjustable from ± 0.8 leading to 0.8 lagging)					
AC Output (Off-grid)						
Rated Output Power	3,000W	3,680W	4,000W	4,600W	5,000W	6,000W
Peak Power, Time	1.5* Rated Power (VA), 60s;					
Overload Power, Time	1.25* Rated Power (VA), 300s;					
Rated Output Current	13.1A	16A	17.4A	20A	21.7A	26.1A
Rated Output Voltage	220/230/240V					
Rated Output Frequency	50/60 (± 0.5%)Hz					
THDu (@Linear Loads)	< 3%					
Switch Time	10ms					
Efficiency						

Maximum Efficiency	97.6%	97.8%	98%
European Efficiency	97.2%	97.3%	97.5%
Maximum Discharging Efficiency	94.6%		
MPPT Efficiency	99.9%		
Protection			
Basic Protection	PV reverse polarity	AC output overvoltage	Anti-islanding
	PV insulation resistance	AC output overcurrent	Grid monitoring
	PV string current monitoring	AC output short circuit	Residual current (RCD) detection
AFCI	Optional		
DC Switch	Included		
SPD	DC Type II/AC Type III		
Environmental Parameters			
Operating Temperature	-30℃ to +60℃		
Relative Humidity	0% to 95%		
Altitude	4,000m (> 2,000m derating)		
Ingress Protection	IP65		
Noise Emission	< 30dB		
Mechanical Parameters			
Dimensions (L × W × H)	620mm × 400mm × 446mm		
Weight	37.5kg		
Others			
Generator Auto Start-up	2 Wire Start		
Standby Losses	< 10W		

Topology	High-Frequency Isolation
Cooling Method	Natural Cooling
Mounting Method	Stacked Installation
Communication with Meter	RS485
Communication with Portal	WiFi/Bluetooth (External)
Display	LCD & APP
Certifications	EN/IEC62109; EN/IEC61000; CEI 0-21; RoHS

7.2 LS51100R Battery Pack

Model	LS51100R					
Battery Type	LFP					
Nominal Capacity	5.12KWh					
Rated Voltage	51.2V					
Rated Charging/Discharging Current	50A/100A					
Charging Temperature	0℃ to 50℃					
Discharging Temperature	-20℃ to 50℃					
Dimensions (L × W × H)	620mm × 400mm × 219mm					
Weight	49kg					
Number of Modules	1	2	3	4	5	6
Capacity	5.12 KWh	10.24 KWh	15.36 KWh	20.48 KWh	25.6 KWh	30.72 KWh
Certifications	UN38.3; MSDS; IEC62619; IEC61000; RoHS; REACH					

8 Technical Support

For technical inquiries regarding our products, please contact us through the following channels:

Service Hotline: 010-82894896/82894112

0752-3889706

0755-89236770

Email: support@epever.com

For more product information, please visit: www.epever.com.

APP Download:



Any changes without prior notice! Version number: V1.0



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