

# ROCKSOLAR

## 24V 3kW DIY Off-Grid Solar Panel Kit

(1320W Solar Panels – SRNE Inverter System)



# 1. Safety Information

This solar power system includes a 24V (12V X 2) battery system and a 3000W off-grid inverter with integrated MPPT charge controller. The system produces electrical energy whenever the solar panels are exposed to sunlight. Improper installation or handling may result in electric shock, fire, or equipment damage. Always follow the safety instructions below before installing or operating the system.

## General Safety

- Installation should be performed by a qualified technician or licensed electrician familiar with solar power systems.
- Follow all local electrical codes and regulations during installation.
- Do not modify system components or wiring unless specified in this manual.
- Use only approved cables, connectors, and protection devices rated for the system voltage and current.

## Electrical Safety

- Solar panels generate electricity whenever exposed to sunlight. Always disconnect or cover the panels before performing wiring or maintenance.
- Always connect the battery bank to the inverter first, before connecting solar panels.
- Use properly rated DC cables, fuses, and circuit breakers suitable for a 24V system and a 3000W inverter.
- Never touch exposed terminals or wires while the system is powered.

## Battery Safety

- The system requires a 24V battery bank (typically two 12V batteries connected in series).
- Batteries can deliver high current and may produce explosive gases, so they must be installed in a well-ventilated location.
- Never short-circuit battery terminals.
- Always verify correct polarity (+ / -) before connecting batteries to the inverter.

## Inverter Safety

- The 3kW inverter produces high AC voltage at the output. Treat the AC output the same as household electricity.
- Do not operate the inverter without proper grounding.
- Ensure the inverter is installed in a dry and ventilated location to prevent overheating.

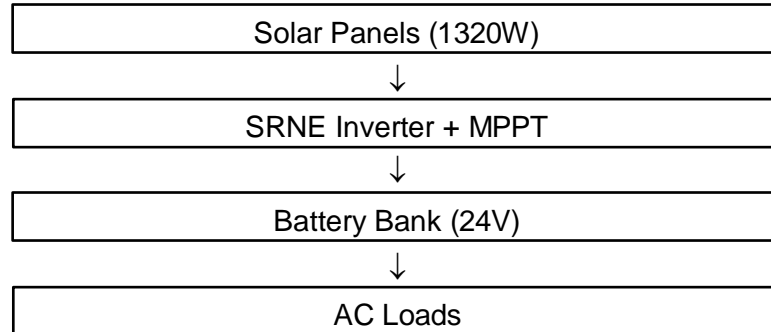
## Maintenance Safety

- Disconnect solar panels and batteries before servicing the system.
- Inspect cables and connections regularly for signs of damage or overheating.
- Clean solar panels periodically to maintain optimal performance.

Failure to follow these safety instructions may result in serious injury, equipment damage, or system malfunction.

## 2. System Overview

This off grid system uses solar panels to charge batteries through an integrated MPPT inverter. The inverter converts battery power to AC electricity for appliances.



### 3. System Components

Component	Description
Solar Panels	3 x 440W monocrystalline panels
Inverter	SRNE 24V 3000W Off Grid Inverter
	Integrated MPPT controller
Battery Bank (May not included)	24V battery system

## 4. Technical Specifications

### Inverter



MODEL		HF2430S60-100	
<b>INVERTER OUTPUT</b>			
Rated Output Power	3,000W		
Max.Peak Power	6,000VA		
Rated Output Voltage	230Vac (Single-Phase)		
Load Motor Capacity	2HP		
Rated Frequency	50/60Hz		
Waveform	Pure sine wave		
Switch Time	10ms (typical)		
<b>BATTERY</b>			
Battery Type	Lead-Acid / Li-ion / User-Define		
Rated Battery Voltage	24V		
Battery Volatge Range	20-33Vdc		
Max. Solar Charging Current	60A		
Max. Grid/Generator Charging Current	80A		
Max. Hybrid Charging Current	140A		
<b>SOLAR INPUT</b>			
No. Of MPPT	1		
Max.PV Array Power	1,600W		
Max. Input Current	40A		
Max. Open Circuit Voltage	108Vdc		
MPPT Voltage Range	30~90Vdc		
<b>GRID/GENERATOR INPUT</b>			
Input Voltage Range	170~280Vac		
Input Frequency Range	50/60Hz		
Bypass Overload Current	30A		
<b>EFFICIENCY</b>			
MPPT Tracking Efficiency	99.9%		
Max. Efficiency	92%		
<b>GENERAL DATA</b>			
Dimension	378*280*103mm	Moisture	5%~95%
Weight	6.8kg	Cooling Method	Fan Cooling
Protection Degree	IP20 Only Indoor	Warranty	2 years
Temperature	-10°C~55°C	Communication	RS485/CAN/USB/Dry Contact
External Module (Optional)	Wi-Fi/GPRS	Topology	Transformerless
Certificate	RoHs/EN61000/IEC 62109/PSE Circular Certification		

# Panels

ELECTRICAL CHARACTERISTICS				
POWER AT STC	425 W	430 W	435 W	440 W
Short Circuit Current - Isc (A)	14.05	14.13	14.22	14.30
Maximum Power Current - Impp (A)	13.23	13.28	13.32	13.36
Open Circuit Voltage - Voc (V)	38.29	38.42	38.50	38.63
Maximum Power Voltage - Vmpp (V)	32.23	32.49	32.76	32.98
Module Efficiency - $\eta'$ (%)	21.80%	22.05%	22.31%	22.57%
Bifaciality Ratio (%)	80% $\pm$ 5			
Power tolerance (%)	0~+3%			

MATERIAL CHARACTERISTICS	
Characteristics	Value
Cells per Module	108 (54x2)
Cell Type	N Type Mono-Crystalline
Front Surface	3.2mm Tempered AR Coated Glass
Back Cover	Transparent Backsheet
Frame	Anodized Aluminum (Black/Silver)
Junction Box	IP 68 With original MC4
Cable Length	1200mm Cable length could be customized
Fire Classification	Type1

## 5. Solar Panel Wiring Diagram



### Step 1 – Connect the Solar Panels in Series

1. Position the three 440W solar panels in their mounting location.
2. Connect the positive (+) cable of Panel 1 to the negative (-) cable of Panel 2.
3. Connect the positive (+) cable of Panel 2 to the negative (-) cable of Panel 3.
4. The remaining negative (-) from Panel 1 and positive (+) from Panel 3 will become the main solar output cables.

This creates a series connection, increasing the voltage for the inverter MPPT input.

### Step 2 – Connect the Battery Bank (Recommended First Connection)

1. Prepare a 24V battery bank (typically two 12V batteries connected in series).
2. Connect the battery positive (+) cable to the inverter BAT+ terminal.
3. Connect the battery negative (-) cable to the inverter BAT- terminal.
4. Ensure polarity is correct before tightening the connections.

**⚠ Important:** Always connect the battery to the inverter before connecting the solar panels.

### Step 3 – Connect the Solar Panels to the Inverter

1. Connect the positive solar cable from the panel string to the inverter PV+ input.
2. Connect the negative solar cable from the panel string to the inverter PV- input.
3. Verify that all connectors are secure.

### Step 4 – Connect the AC Output (Load)

1. Connect the inverter AC output terminals to the AC distribution or directly to the electrical loads.
2. Ensure the load does not exceed the 3000W inverter capacity.

### Step 5 – System Startup

1. Turn on the inverter.
2. The inverter will detect the 24V battery bank and begin operation.

## 6. Battery Wiring

Configuration	Example
24V Battery Bank	2 x 12V batteries in series

## 7. Installation Overview

- 1. Mount the Solar Panels**  
Install the three 440W solar panels securely on a roof, rack, or ground-mount structure. Panels should face the sun and be positioned to avoid shading.
- 2. Install the Battery Bank**  
Prepare a 24V battery bank (typically two 12V batteries connected in series). Place the batteries in a ventilated and protected location.
- 3. Mount the Inverter**  
Install the 24V 3000W SRNE inverter with integrated MPPT controller close to the battery bank to minimize cable length. Ensure adequate ventilation around the inverter.
- 4. Connect the Battery to the Inverter**  
Connect the battery bank to the inverter terminals, observing correct polarity (+ / -). The battery should always be connected before solar panels.
- 5. Connect the Solar Panels**  
Wire the three solar panels in series, then connect the output cables to the inverter PV input terminals.
- 6. Connect the AC Output**  
Connect the inverter AC output to the electrical loads or distribution panel.
- 7. Start the System**  
After confirming all connections are secure, turn on the inverter. The system will begin charging the batteries when sunlight is available and provide AC power to connected loads.

## 8. Solar Panel Installation

Install the solar panels in a location that receives maximum direct sunlight throughout the day. In the Northern Hemisphere, panels should be mounted facing south for best performance.

The recommended tilt angle is between 25° and 40°, depending on location. Ensure the panels are mounted on a secure and stable structure such as a roof or ground mount.

Avoid installing panels where they may be shaded by trees, buildings, or other objects, as shading can significantly reduce power generation.

Ensure all panels are securely mounted and cables are properly routed and protected from damage.

## 9. Battery Installation

Install the 24V battery bank in a dry and well-ventilated location to prevent heat buildup and gas accumulation.

Connect the batteries in series (two 12V batteries) to create a 24V system. Use properly sized DC cables suitable for the inverter current.

Install a DC fuse or circuit breaker between the battery and inverter for protection. Ensure the correct polarity (+ / -) when connecting the battery cables to the inverter terminals.

## 10. Inverter Installation

Mount the 24V 3000W inverter close to the battery bank to reduce cable length and power loss. Install the inverter on a solid vertical surface in a dry and well-ventilated area.

Ensure there is sufficient space around the inverter for airflow to prevent overheating. Avoid installing the inverter in areas exposed to moisture, direct sunlight, or excessive heat.

Secure the inverter firmly and ensure all DC and AC connections are properly tightened before operation.

# 11. Maintenance

Regular maintenance helps ensure optimal system performance and longevity.

Clean the solar panels periodically to remove dust, dirt, snow, or debris that may reduce energy production. Inspect all cables, connectors, and mounting hardware every 6–12 months to ensure they remain secure and free from damage.

If any loose connections, corrosion, or damaged components are found, repair or replace them promptly.

## 12. Troubleshooting

### 6.2 Fault code meaning

Fault code	Fault name	Whether it affects the output or not	Description
[01]	BatVoltLow	Yes	Battery undervoltage alarm
[02]	BatOverCurrSw	Yes	Battery discharge average current overcurrent software protection
[03]	BatOpen	Yes	Battery not-connected alarm
[04]	BatLowEod	Yes	Battery undervoltage stop discharge alarm
[05]	BatOverCurrHw	Yes	Battery overcurrent hardware protection
[06]	BatOverVolt	Yes	Charging overvoltage protection
[07]	BusOverVoltHw	Yes	Bus overvoltage hardware protection
[08]	BusOverVoltSw	Yes	Bus overvoltage software protection
[09]	PvVoltHigh	No	PV overvoltage protection
[10]	PvBuckOCSw	No	Buck overcurrent software protection
[11]	PvBuckOCHw	No	Buck overcurrent hardware protection
[12]	bLineLoss	No	Mains power down
[13]	OverloadBypass	Yes	Bypass overload protection
[14]	OverloadInverter	Yes	Inverter overload protection
[15]	AcOverCurrHw	Yes	Inverter overcurrent hardware protection
[17]	InvShort	Yes	Inverter short circuit protection
[19]	OverTemperMppt	No	Buck heat sink over temperature protection
[20]	OverTemperInv	Yes	Inverter heat sink over temperature protection
[21]	FanFail	Yes	Fan failure
[22]	EEPROM	Yes	Memory failure
[23]	ModelNumErr	Yes	Model setting error
[26]	RlyShort	Yes	Inverted AC Output Backfills to Bypass AC Input
[29]	BusShort	Yes	Internal battery boost circuit failure

## **13. Warranty**

The solar panels included in this kit come with a 25-year performance warranty.

The SRNE 24V 3000W inverter includes a 5-year manufacturer warranty against defects in materials and workmanship.

Warranty coverage is subject to the manufacturer's terms and conditions. Improper installation, misuse, or unauthorized modifications may void the warranty.

## 14. Technical Support

Mail Us at: [support@rocksolar.io](mailto:support@rocksolar.io)

Call Us at: [+1 \(800\) 858-4318](tel:+1(800)858-4318)

## **15. Installer Notes**

Record system configuration, battery type, and installation date for future maintenance.







