

ROCKSOLAR

3.5 kW Off-Grid Solar Panel Kit

(2640 W Solar Panels – 6 × 440 W)

User & Installation Manual Professional Edition

1. Introduction

Thank you for choosing the ROCKSOLAR 3.5 kW Off-Grid Solar Panel Kit. This system is designed to provide reliable solar power for off-grid homes, cabins, workshops, and backup power applications.

The system converts sunlight into electricity using photovoltaic (PV) solar panels and stores the energy in a battery bank for later use.

This manual provides instructions for:

- System installation • Electrical wiring • System configuration • Operation and monitoring
- Maintenance and troubleshooting

⚠ Installation must be performed by a qualified electrician or certified solar installer.

2. System Overview

The ROCKSOLAR off-grid solar system produces renewable electricity and stores it in batteries to power appliances and electrical loads without relying on the utility grid.

System Power Flow

Solar Panels → Inverter with MPPT → Battery Bank → AC Loads

During the day solar panels generate electricity to charge the battery and power loads. At night the inverter draws power from the battery bank.

3. System Components

Solar Panels

6 × 440 W Monocrystalline Bifacial Solar Panels

Total PV Array Capacity: 2640 W

Key Features:

- High efficiency solar cells
 - Tempered anti-reflective glass
 - Weather-resistant aluminum frame
 - 25-year performance lifespan
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Inverter / Charger

Growatt SPF3500TLVLM-US Off-Grid Inverter

Key specifications:

- 3500 W continuous output
 - Pure sine wave AC output
 - Integrated MPPT solar charge controller
 - Battery charger and inverter integrated
 - LCD system monitoring display
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Battery System

Typical configuration:

48 V lithium battery system

Battery capacity determines system runtime and backup duration.

4. Technical Specifications

Specification	Value
System Type	Off-Grid Solar System
Inverter Output	3500 W
Solar Panels	6 × 440 W
Solar Array	2640 W
Battery Voltage	48 V
Charge Controller	MPPT (Integrated)

5. Safety Information

⚠ Solar panels generate high voltage when exposed to sunlight.

Safety guidelines:

- Disconnect batteries before servicing
- Use insulated tools
- Wear personal protective equipment
- Follow local electrical codes

Applicable standards may include:

CSAULCEC NEC

6. System Architecture Diagram

Solar PV Array (2640 W)

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Growatt SPF3500TL Inverter

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48 V Battery Bank

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AC Distribution Panel

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AC Loads

7. Solar Panel String Configuration

All solar panels are connected in one series string.

String Configuration

Panel 1 → Panel 2 → Panel 3 → Panel 4 → Panel 5 → Panel 6

The output of the string connects directly to the inverter PV input terminals.

Series wiring increases voltage for optimal MPPT operation.

8. Single Line Electrical Diagram

PV Array (2640 W)

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DC Disconnect

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Growatt SPF3500TL Inverter

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Battery Bank (48 V)

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AC Output

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Loads

9. Installation Overview

Typical installation process:

1. Perform site survey and shading analysis
 2. Install solar panel mounting structure
 3. Mount solar panels
 4. Install inverter
 5. Install battery bank
 6. Connect PV wiring
 7. Connect battery cables
 8. Connect AC loads
 9. Commission system
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10. Solar Panel Installation

Installation guidelines:

- Face panels south in the Northern Hemisphere
 - Tilt panels between 25° and 40°
 - Avoid shading from trees or structures
 - Maintain airflow beneath panels
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11. Inverter Installation

Mount inverter:

- On a solid vertical wall
- Near battery bank
- In shaded ventilated area

Clearances:

Top: 300 mm Sides: 200 mm Bottom: 300 mm

12. Battery Installation

Install batteries in a dry ventilated environment.

Safety recommendations:

- Install battery fuse or breaker
 - Use properly rated cables
 - Avoid short circuits
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13. System Startup

Startup procedure:

1. Connect batteries
 2. Power on inverter
 3. Connect solar panels
 4. Verify charging current
 5. Connect AC loads
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14. System Operation

Daytime Operation

Solar Panels → Charge Battery → Power Loads

Night Operation

Battery → Inverter → AC Loads

15. Maintenance

Perform maintenance every 6–12 months.

Recommended checks:

- Clean solar panels
 - Inspect cables and connectors
 - Verify inverter operation
 - Check battery health
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16. Troubleshooting

Problem	Possible Cause	Solution
No AC power	Inverter off	Turn inverter on
Battery not charging	PV wiring issue	Check connections
Low power output	Dirty panels	Clean panels

17. Installer Checklist

Pre-Installation

- Site survey
- Mounting structure installed

Installation

- Panels mounted
- Wiring verified
- Inverter installed

Commissioning

- Inverter startup verified
 - Battery charging confirmed
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18. Warranty

Solar Panels: 25-Year performance warranty

Inverter: Manufacturer warranty

Battery warranty varies by model.

19. Technical Support

ROCKSOLAR

Website: <https://rocksolar.io>

Support: support@rocksolar.io

20. Disclaimer

This manual provides general guidance for installation and operation of ROCKSOLAR solar systems. Installations must comply with local electrical codes and safety regulations.

END OF MANUAL