ROCKSOLAR 24kW Off-Grid Solar Home System

Installation, Operation & Maintenance Manual
Canada & USA Edition
Version 1.0

System Configuration

- 2 × Growatt SPE12000 US Off-Grid Inverters (parallel operation)
- 36 × 440W Solar Panels (15.84kW total)
- Battery Option A: 2 × 14.34kWh LiFePO4 (28.68kWh)
- Battery Option B: 6 × 5kWh LiFePO4 (30kWh)
- Generator-ready input
- WiFi monitoring module included
- 120/240V split-phase output

PV Configuration

Solar array is configured as four strings of nine 440W modules in series. Two strings are connected to Inverter #1 and two strings to Inverter #2 through DC circuit breakers in the breaker box.

System Wiring Overview

36 x 440W Panels
↓
4 Strings (9 Panels per String)
↓
PV Combiner Box
↓
DC Disconnect
↓
2 × Growatt SPE12000 US (Parallel)
↓
120/240V Main Distribution Panel
↓
House Loads

Battery Bank → DC Busbars → Both Inverters
Generator → Generator Breaker → Inverter AC Input

Recommended Wire Gauge

Connection	Recommended Wire	Notes
PV String Wiring	10 AWG PV Wire	USE-2/PV rated
Battery to DC Bus	4/0 AWG Cu	Equal cable lengths
DC Bus to Each Inverter	2/0 AWG Cu	Fine-strand battery cable
Inverter AC Output	6 AWG Cu	Verify breaker size
Generator Input	6 AWG Cu	Based on generator rating
Equipment Ground	6-10 AWG Cu	Per NEC/CEC
CAN/RS485	CAT5e/CAT6	Manufacturer guidance

Installation Sequence

1. Mount solar panels.
2. Install PV combiner and DC disconnect.
3. Mount both SPE12000 US inverters.
4. Install battery bank and DC protection.
5. Connect PV strings.
6. Connect battery cables.
7. Connect AC output to distribution panel.
8. Connect generator input.
9. Install WiFi module and commission the system.

Startup Procedure

10. Turn ON battery breaker.
11. Power ON Master inverter.
12. Power ON Slave inverter.
13. Turn ON PV disconnect.
14. Verify parallel synchronization.
15. Energize AC loads.
16. Configure WiFi monitoring.

Maintenance

- Inspect wiring torque every 6 months.
- Clean PV modules as required.
- Check battery SOC and firmware.
- Exercise generator monthly.
- Inspect grounding annually.

Note

Final conductor sizing, breaker sizing, and protective devices must be verified by a licensed electrician in accordance with the Canadian Electrical Code (CEC) and the National Electrical Code (NEC), considering installation conditions and voltage-drop calculations.