Off-Grid Build Sheet

Owner: Site: Date:

Inverter: ☐ SGPWOSAY 5000W ☐ EG4 6000XP ☐ SUNGOLDPOWER 10kW ☐ EG4 12000XP

Battery: ☐ 16kWh ☐ 2 × 16kWh ☐ 32kWh

Inverter specs

	SGPWOSAY 5000W	EG4 6000XP	SUNGOLDPOWER 10kW	EG4 12000XP
Output	5,000W, 120V only	6,000W, 120/240V	10,000W, 120/240V	12,000W, 120/240V
Solar input	5,500W, 1 MPPT	8,000W, 2 MPPT	11,000W, 2 MPPT	24,000W, 2 MPPT
MPPT range / max PV	120–450V / 500V	120–385V / 480V	125–425V / 500V	120–385V / 480V
PV current per input	22A	17A usable, 25A Isc	22A	35A usable, 44A Isc
Battery charging	100A (40A from AC)	125A solar, 115A AC	200A	250A
Max battery current	about 105A	140A	about 210A	250A

Wire and protection (from each manual)

	SGPWOSAY 5000W	EG4 6000XP	SUNGOLDPOWER 10kW	EG4 12000XP
Battery cable	2 AWG	2/0 AWG (manual minimum 1 AWG)	4/0 AWG	4/0 AWG, or two 2/0 AWG pairs
Battery fuse or DC breaker	200A	200A	250A	300A
AC wire	8 AWG in and out, 63A breaker	8 AWG grid, gen and load	6 AWG in and out, 63A breaker	3 AWG grid and load, 4 AWG gen
PV wire	10 AWG (manual minimum 12 AWG)	10 AWG	10 AWG	10 AWG
Battery terminal torque	See manual	97–106 in-lb	See manual	200 in-lb (2/0), 250 in-lb (4/0)

6000XP: the manual lists 1 AWG and no fuse size. 2/0 AWG copper (175A at 75°C, NEC Table 310.16) with a 200A fuse, the next standard size up (NEC 240.4(B)), covers its 140A max discharge. PV disconnects must be rated above the string voltage: 500V or more. The electrician sizes AC breakers and wire for the panel and run length.

Solar strings (SunGold 590W: Voc 52.35V, Vmp 44.4V, −0.28%/°C)

Inverter	Panels per string	Strings	Array	String Voc at 77°F / −22°F	String Vmp
SGPWOSAY 5000W	8	1	4,720W	419V / 483V	355V
EG4 6000XP	7	2	8,260W	366V / 423V	311V
SUNGOLDPOWER 10kW	8	2	9,440W	419V / 483V	355V
EG4 12000XP	7	4 (2 per input)	16,520W	366V / 423V	311V

My panel Voc: × panels: = string Voc: × 1.15 cold = Under max PV? ☐

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Startup order

1. Everything off. Meter battery and PV polarity and voltage.
2. Battery breaker on the inverter on.
3. Batteries on, one at a time.
4. Inverter power switch on. Check for warnings.
5. PV disconnect on.
6. AC IN breaker on, if a generator or grid feeds it.
7. Output breaker on (EG4: EPS Output switch on). Loads on one at a time, smallest first.

Shutdown is the reverse. Each manual lists its own order; follow it where it differs.

Neutral-ground bond (one per system)

Inverter	Setting	Default
SGPWOSAY 5000W	Menu 63, N-G automatically connect	Disabled
EG4 6000XP	Setting 26 (standby only)	Enabled
SUNGOLDPOWER 10kW	Menu 63, Auto N-PE connection	Disabled
EG4 12000XP	N-PE Connect (Inner), Application tab	Check screen

- Off-grid, nothing else connected: inverter bond enabled, or a bonding screw in the load panel. Not both.
- Feeding a house with its own bond: inverter bond disabled. Electrician confirms.

Checklist

☐ Inverter
☐ Battery (one 16kWh for 5–6kW; 32kWh or two 16kWh for 10–12kW)
☐ Bus bars if more than one battery
☐ Battery cable and lugs, sized above
☐ Class T fuse or DC breaker, sized above
☐ Solar panels and racking
☐ One PV disconnect per string, rated 500V DC or more
☐ 10 AWG PV wire and MC4 connectors
☐ THHN wire and conduit for AC OUT
☐ Load panel, main breaker and branch breakers
☐ Romex for branch circuits
☐ Ground wire; ground rod if the electrician calls for one
☐ Torque wrench, crimper, cable cutter, clamp meter

For the electrician (house connection)

- Transfer switch for critical loads, fed from the off-grid load panel through a two-pole breaker
- Size the conductors and breaker; ground the system to the NEC
- Decide on ground rod and surge protection for the site
- Set the inverter's neutral-ground bond to match the transfer switch

These inverters are rated for indoor use only. Never mount them outdoors.

Notes:

Specs and wire sizes come from the SGPWOSAY/SUNGOLDPOWER SPH5048P and SPH10048P manuals, the EG4 6000XP manual and data sheet, and the EG4 12000XP manual and spec sheet. Check your unit's manual before you build.