

123-SG-7S82-40

Solar Generator, modular pairing
solar.123e.com/123-SG-7S82-40



12 kW as two units: sixteen panels backed by a standalone 40 kW diesel.



OVERVIEW

A new cell site is often ready to go on air before utility power reaches it, and until it does, a temporary diesel generator runs it around the clock. 123-SG-7S82-40 puts that site on air as two units working as one system: a sixteen-panel solar and battery trailer that carries the site, and a standalone 40 kW diesel generator that steps in only when the sun and the battery cannot.

The solar trailer is rated for 12 kW continuous, with surges to 24 kW for motor and compressor starts. Its 7.36 kW array brings in 31.6 kWh on an average day to a 30.4 kWh lithium iron phosphate bank. Below 1.32 kW the site runs on sun and battery alone, indefinitely, with the engine off.

Above that, the 40 kW generator does two jobs at once: it carries the load and recharges the bank at the inverter's full charge rate, then shuts down. At a steady 6 kW that is about 6.2 engine hours a day and 15.91 days between refuels of its 140-gallon tank, against 7.92 days for the same generator carrying the load alone — 8.36 gallons a day instead of 16.8. At 4 kW the tank lasts 27.62 days and at 2 kW 107.9, while the generator alone still refuels every 7.92. Both engines are read by the same fuel rule: their own published figures, held at the lowest one below it. At a remote site every refuel is a truck, a driver and a day on the road, so the days between refuels are what make this the cost-effective way to keep the site on air.

Because the generator travels on its own trailer, either unit can be serviced or replaced without taking the other offline, and the solar trailer can work alone where an engine is not allowed. Output is 120/240 V or 120/208 V at 50/60 Hz, with a 5 ms transfer.

FEATURES AND BENEFITS

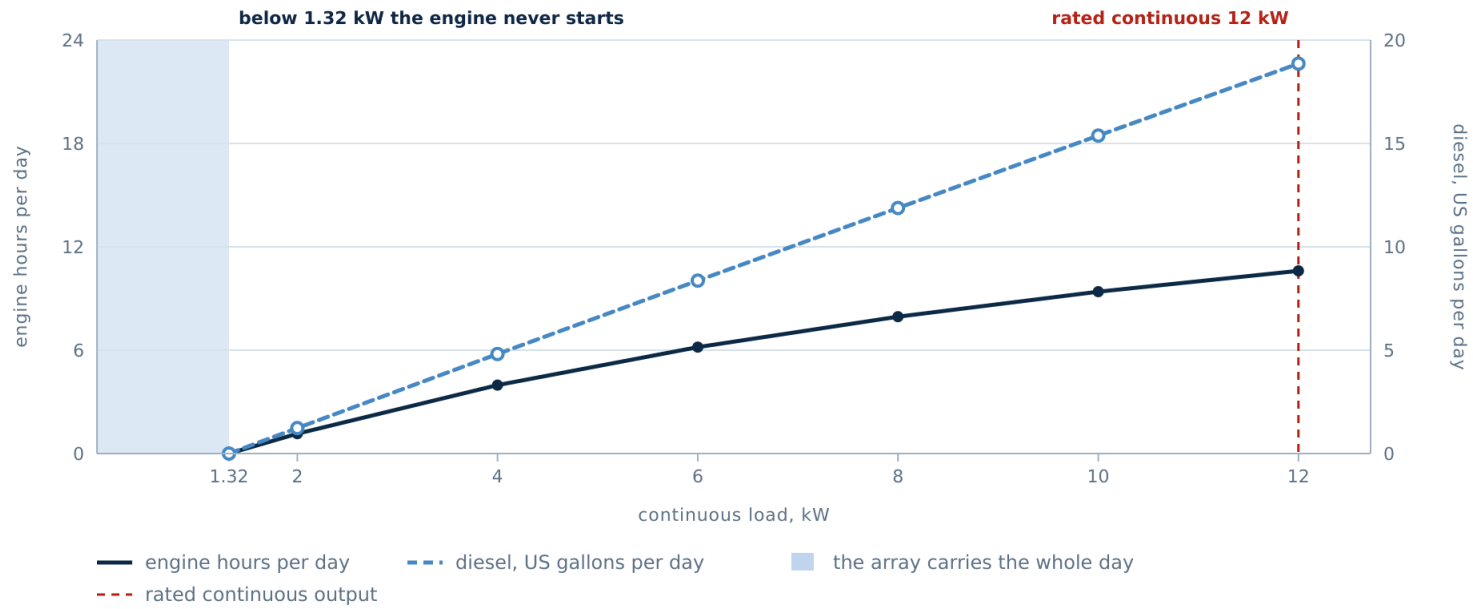
- **Sixteen 460 W panels, 7.36 kW** — Loads around a kilowatt run with the engine off.
- **Standalone 40 kW diesel, 140-gallon tank** — 15.9 days between refuels at 6 kW.
- **30.4 kWh lithium iron phosphate bank** — Quiet nights on sites with neighbours or noise limits.
- **A solar trailer and a generator trailer** — One site, two independent machines, and no single point of downtime for maintenance.

KEY SPECIFICATIONS

POWER	
Rated continuous output	12 kW
Peak output	12 kW
Surge	24 kW
Surge, 30 minutes	13 kW
Output voltage and phase	120/240 V or 120/208 V
Output frequency	50 / 60 Hz
Transfer time	5 ms
ENERGY STORAGE	
Battery technology	Lithium iron phosphate (LFP)
Arrays installed	8
Total stored energy	30.4 kWh
Usable stored energy at 50%	15.2 kWh
Silent runtime at 6 kW	2.4 hours
SOLAR	
Array rated power	7.36 kW
Solar panels	16 x 460 W
Daily solar production	31.6 kWh/day
Load covered by solar alone	1.32 kW
DIESEL BACKUP	
Generator output	40 kW
Fuel capacity	140 US gallons
Days between refuels at 6 kW	15.9 days
Engine starts and stops at	30% and 80% state of charge
Engine runs at 6 kW	5 a day, 1.2 h each
MECHANICAL AND SITE	
Ambient operating range	-4 to 140 °F (-20 to 60 °C)

PERFORMANCE ACROSS THE LOAD RANGE

What the engine does at each load. Below 1.32 kW the array carries the whole day and the engine never starts. Above it, the engine runs only to put back what the sun did not: at 12 kW, 10.6 hours a day on 18.9 US gallons.



LOAD, CONTINUOUS	BATTERY ONLY	DAILY DRAW	AFTER SOLAR	GENERATOR	ENGINE RUNS	DIESEL	DAYS ON A TANK
1.32 kW · solar break-even	11.12 h	31.6 kWh	covered	0 h/day	none	0 gal/day	—
2 kW	7.33 h	48 kWh	16.4 kWh	1.15 h/day	0.9 × 1.2 h	1.2 gal/day	107.9 days
4 kW	3.67 h	96 kWh	64.4 kWh	3.98 h/day	3.2 × 1.2 h	4.8 gal/day	27.6 days
6 kW	2.44 h	144 kWh	112.4 kWh	6.18 h/day	5 × 1.2 h	8.4 gal/day	15.9 days
8 kW	1.83 h	192 kWh	160.4 kWh	7.94 h/day	6.4 × 1.2 h	11.9 gal/day	11.2 days
10 kW	1.47 h	240 kWh	208.4 kWh	9.39 h/day	7.5 × 1.2 h	15.4 gal/day	8.6 days
12 kW	1.22 h	288 kWh	256.4 kWh	10.6 h/day	8.5 × 1.2 h	18.9 gal/day	7.1 days

Every load runs continuously and the day is 24 hours: daily draw is the load × 24 h. Solar is a daily energy offset, not an instantaneous power match. The engine starts at 30% state of charge (a 70% depth of discharge) and stops at 80%, putting 15.2 kWh back into the bank on each run while it carries the load.

CASE STUDY: AGAINST THE 40 KW GENERATOR RUNNING ALONE

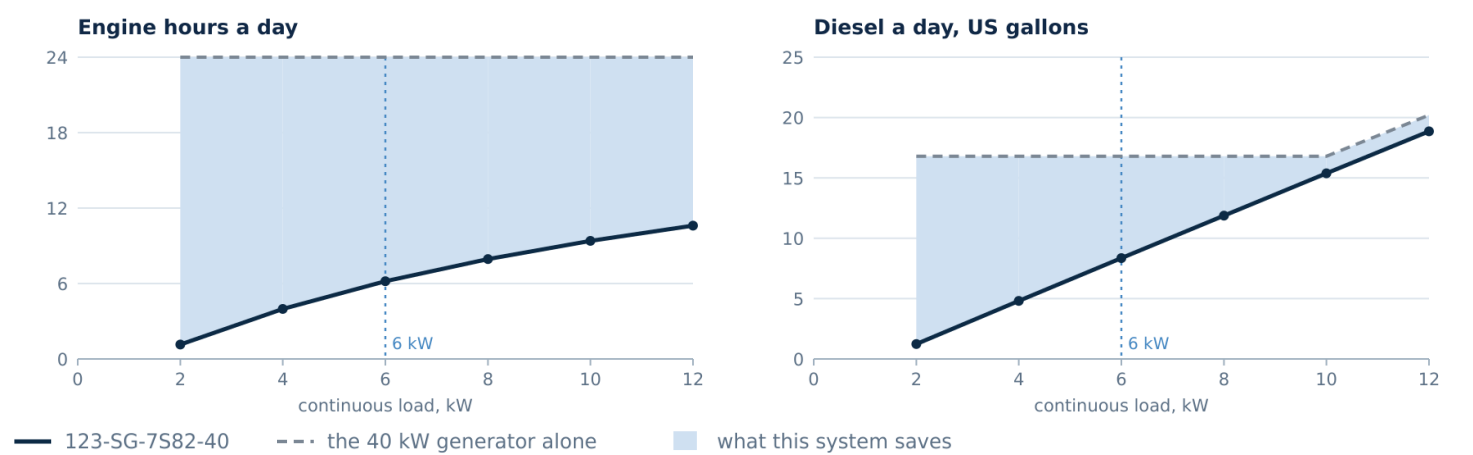
At 6 kW around the clock, its own 40 kW generator — the one telecom sites use for temporary power — would carry the site alone at 15% of its rating, 24 hours a day. 123-SG-7S82-40 runs its engine **6.2 hours a day** — **74% fewer engine hours** — and burns **50% less diesel**: 8.4 US gallons a day against 16.8 US gallons, and 15.9 days between refuels against 7.9 days.



The 40 kW generator alone
Engine 24 h a day at 15% of its rating · 16.8 gal a day



123-SG-7S82-40
Engine 6.2 h a day, the sun and the battery the rest · 8.4 gal a day



LOAD, CONTINUOUS	40 KW ALONE	DAYS ON A TANK	THIS SYSTEM, ENGINE	THIS SYSTEM, DIESEL	DAYS ON A TANK	ENGINE HOURS SAVED	DIESEL SAVED
2 kW	16.8 gal/day	7.9 days	1.2 h/day	1.2 gal/day	107.9 days	95%	93%
4 kW	16.8 gal/day	7.9 days	4 h/day	4.8 gal/day	27.6 days	83%	71%
6 kW	16.8 gal/day	7.9 days	6.2 h/day	8.4 gal/day	15.9 days	74%	50%
8 kW	16.8 gal/day	7.9 days	7.9 h/day	11.9 gal/day	11.2 days	67%	29%
10 kW	16.8 gal/day	7.9 days	9.4 h/day	15.4 gal/day	8.6 days	61%	8%
12 kW	20.2 gal/day	6.6 days	10.6 h/day	18.9 gal/day	7.1 days	56%	7%

The 40 kW generator telecom sites use for temporary power carries the load alone, 24 h a day with no sun and no battery, on its own 140-gallon tank (133 usable). Both engines are read by the same rule: their own published fuel figures, a straight line between them, and below the lowest published point that point's burn.