

123-STG-42S51

Solar Tri-Brid™ Generator
solar.123e.com/123-STG-42S51



10 kW Tri-Brid™: sun first, battery second, diesel only when both run short.



Solar, lithium storage and a 10.8 kW diesel on one trailer, stowed for the road.

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-STG-42S51 is the all-in-one Tri-Brid™ for that job: solar, lithium storage and a diesel generator built into one trailer, so a single tow puts a complete power plant on the site with no second unit to coordinate.

It is rated for 10 kW continuous — the inverter sets that limit — with surges to 24 kW for motor starts. The 4.6 kW array produces 19.8 kWh on an average day into a 19 kWh lithium iron phosphate bank, and below 0.82 kW the sun and the battery carry the site on their own.

When the load runs higher, the controller starts the 10.8 kW diesel, runs it at full output — carrying the load and recharging the bank together — and shuts it down again once the bank is charged. At a steady 5 kW that is about 9.7 engine hours a day where the 40 kW generator telecom sites use for temporary power would run all 24, and 10.89 gallons of diesel a day instead of 16.8. The 89-gallon tank lasts 7.76 days between refuels, against 7.92 for the 40 kW alone on its larger tank; at 3.33 kW it lasts 12.76 days. 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. The engine is certified to EPA Tier 4 Final.

Output is 120/240 V or 120/208 V at 50/60 Hz with a 5 ms transfer, rated for operation from -4 to 140 °F (-20 to 60 °C).

FEATURES AND BENEFITS

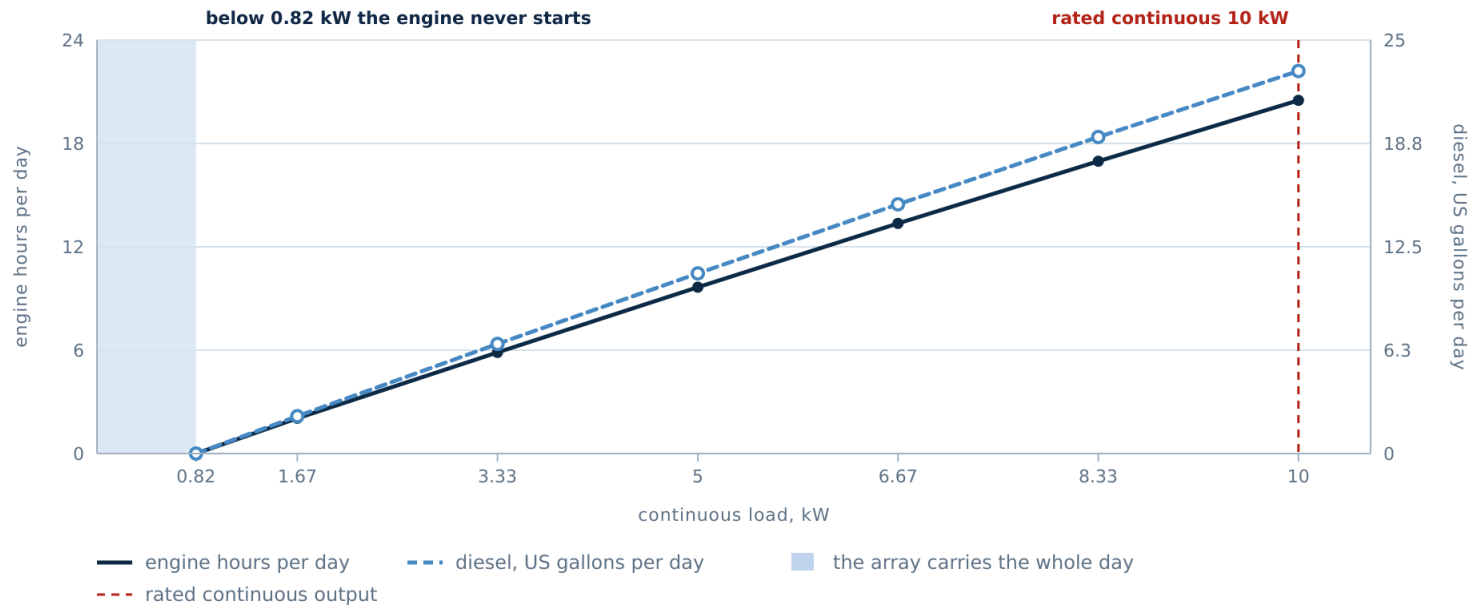
- **Solar, lithium and a 10.8 kW diesel in one trailer** — One machine to transport, place and service.
- **Ten 460 W panels, 4.6 kW** — Light loads run silent and burn no fuel.
- **89-gallon tank, EPA Tier 4 Final engine** — 7.8 days between refuels at 5 kW.
- **24 kW surge** — Start-up spikes are covered without oversizing the engine.

KEY SPECIFICATIONS

POWER	
Rated continuous output	10 kW
Peak output	10 kW
Surge	24 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	5
Total stored energy	19 kWh
Usable stored energy at 50%	9.5 kWh
Silent runtime at 5 kW	1.9 hours
SOLAR	
Array rated power	4.6 kW
Solar panels	10 x 460 W
Daily solar production	19.8 kWh/day
Load covered by solar alone	0.82 kW
DIESEL BACKUP	
Generator output	10.8 kWe
Fuel capacity	89 US gallons
Days between refuels at 5 kW	7.8 days
Engine starts and stops at	30% and 80% state of charge
Engine runs at 5 kW	5.5 a day, 1.8 h each
Emissions	EPA Tier 4 Final
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 0.82 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 10 kW, 20.5 hours a day on 23.1 US gallons.



LOAD, CONTINUOUS	BATTERY ONLY	DAILY DRAW	AFTER SOLAR	GENERATOR	ENGINE RUNS	DIESEL	DAYS ON A TANK
0.82 kW · solar break-even	11.25 h	19.8 kWh	covered	0 h/day	none	0 gal/day	—
1.67 kW	5.56 h	40 kWh	20.2 kWh	2.04 h/day	1.8 × 1.2 h	2.3 gal/day	37.4 days
3.33 kW	2.78 h	80 kWh	60.2 kWh	5.87 h/day	4.3 × 1.4 h	6.6 gal/day	12.8 days
5 kW	1.85 h	120 kWh	100.2 kWh	9.66 h/day	5.5 × 1.8 h	10.9 gal/day	7.8 days
6.67 kW	1.39 h	160 kWh	140.2 kWh	13.36 h/day	5.4 × 2.5 h	15.1 gal/day	5.6 days
8.33 kW	1.11 h	200 kWh	180.2 kWh	16.97 h/day	4.1 × 4.2 h	19.1 gal/day	4.4 days
10 kW	0.93 h	240 kWh	220.2 kWh	20.5 h/day	1.6 × 12.8 h	23.1 gal/day	3.7 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 9.5 kWh back into the bank on each run while it carries the load.

AGAINST THE 40 KW GENERATOR RUNNING ALONE

LOAD, CONTINUOUS	40 KW ALONE	DAYS ON A TANK	THIS SYSTEM, ENGINE	THIS SYSTEM, DIESEL	DAYS ON A TANK	ENGINE HOURS SAVED	DIESEL SAVED
1.67 kW	16.8 gal/day	7.9 days	2 h/day	2.3 gal/day	37.4 days	91%	87%
3.33 kW	16.8 gal/day	7.9 days	5.9 h/day	6.6 gal/day	12.8 days	76%	61%
5 kW	16.8 gal/day	7.9 days	9.7 h/day	10.9 gal/day	7.8 days	60%	35%
6.67 kW	16.8 gal/day	7.9 days	13.4 h/day	15.1 gal/day	5.6 days	44%	10%
8.33 kW	16.8 gal/day	7.9 days	17 h/day	19.1 gal/day	4.4 days	29%	14% more
10 kW	16.8 gal/day	7.9 days	20.5 h/day	23.1 gal/day	3.7 days	15%	38% more

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.