

# 123-STG-72D62

Solar Tri-Brid™ Generator  
solar.123e.com/123-STG-72D62



10.8 kW Tri-Brid™ with a 31.8 kWh bank and 9.4 days on a tank at 6 kW.



The Tri-Brid™ stowed: solar, lithium storage and a 10.8 kW diesel on one trailer.

## 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-72D62 is a Tri-Brid™ built for that job: sixteen panels, a 31.8 kWh lithium iron phosphate bank and a 10.8 kW diesel generator on one trailer. Sun first, battery second, and the engine only when both run short.

The 7.36 kW array harvests 31.6 kWh on an average day, and below 1.32 kW the site runs on sun and battery alone with the engine off. The generator sets the 10.8 kW continuous rating; the battery carries peaks to 12 kW and surges to 24 kW for 10 seconds, so motor starts never lean on the engine.

When the load is above the break-even, the controller runs the generator to carry the load and recharge the bank together, then shuts it down. At a steady 6 kW that is 10.77 engine hours a day where the 40 kW generator telecom sites use for temporary power would run all 24, and 9.38 days between refuels of the 120-gallon tank against 7.92 for the 40 kW alone — 12.15 gallons a day instead of 16.8. At 4 kW the tank lasts 16.14 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 bank alone carries 6 kW for 2.56 hours, with 15.9 kWh usable at the standard 50% reserve and 22.26 kWh at the 30% setting. 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 +14 to +131 °F (-10 to +55 °C). Size a continuous load at or under 10.8 kW; the table below shows what happens at every step.

### FEATURES AND BENEFITS

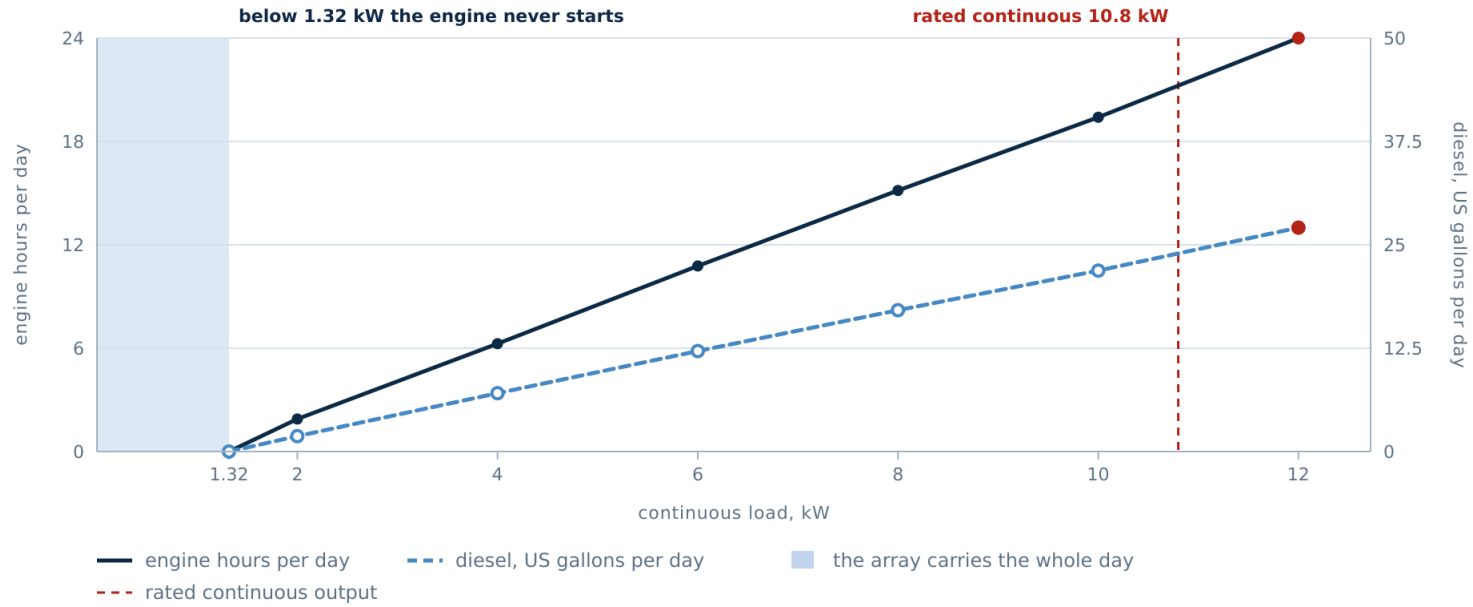
- **Sixteen 460 W panels, 7.36 kW** — Around a kilowatt, the site runs on sun and battery alone.
- **31.8 kWh lithium iron phosphate bank** — Fewer engine starts and longer silent periods.
- **10.8 kWe EPA Tier 4 Final diesel, 120-gallon tank** — 9.4 days between refuels at 6 kW, and 16.14 days at 4 kW.
- **24 kW surge for 10 seconds, 5 ms transfer** — Sensitive equipment rides through without a reboot.

## KEY SPECIFICATIONS

| POWER                        |                                |
|------------------------------|--------------------------------|
| Rated continuous output      | 10.8 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             | 6                              |
| Total stored energy          | 31.8 kWh                       |
| Usable stored energy at 50%  | 15.9 kWh                       |
| Silent runtime at 6 kW       | 2.6 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             | 10.8 kWe                       |
| Fuel capacity                | 120 US gallons                 |
| Days between refuels at 6 kW | 9.4 days                       |
| Engine starts and stops at   | 30% and 80% state of charge    |
| Engine runs at 6 kW          | 3 a day, 3.6 h each            |
| Emissions                    | EPA Tier 4 Final               |
| MECHANICAL AND SITE          |                                |
| Ambient operating range      | +14 to +131 °F (-10 to +55 °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 10 kW, 19.4 hours a day on 21.9 US gallons.



| LOAD, CONTINUOUS           | BATTERY ONLY | DAILY DRAW | AFTER SOLAR | GENERATOR   | ENGINE RUNS  | DIESEL       | DAYS ON A TANK |
|----------------------------|--------------|------------|-------------|-------------|--------------|--------------|----------------|
| 1.32 kW · solar break-even | 11.64 h      | 31.6 kWh   | covered     | 0 h/day     | none         | 0 gal/day    | —              |
| 2 kW                       | 7.67 h       | 48 kWh     | 16.4 kWh    | 1.89 h/day  | 0.8 × 2.4 h  | 1.9 gal/day  | 61 days        |
| 4 kW                       | 3.84 h       | 96 kWh     | 64.4 kWh    | 6.26 h/day  | 2.5 × 2.5 h  | 7.1 gal/day  | 16.1 days      |
| 6 kW                       | 2.56 h       | 144 kWh    | 112.4 kWh   | 10.77 h/day | 3 × 3.6 h    | 12.2 gal/day | 9.4 days       |
| 8 kW                       | 1.92 h       | 192 kWh    | 160.4 kWh   | 15.15 h/day | 2.5 × 6.2 h  | 17.1 gal/day | 6.7 days       |
| 10 kW                      | 1.53 h       | 240 kWh    | 208.4 kWh   | 19.4 h/day  | 0.9 × 21.5 h | 21.9 gal/day | 5.2 days       |
| 12 kW                      | 1.28 h       | 288 kWh    | 256.4 kWh   | 24 h/day    | —            | 27.1 gal/day | 4.2 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 15.9 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 |
|------------------|--------------|----------------|---------------------|---------------------|----------------|--------------------|--------------|
| 2 kW             | 16.8 gal/day | 7.9 days       | 1.9 h/day           | 1.9 gal/day         | 61 days        | 92%                | 89%          |
| 4 kW             | 16.8 gal/day | 7.9 days       | 6.3 h/day           | 7.1 gal/day         | 16.1 days      | 74%                | 58%          |
| 6 kW             | 16.8 gal/day | 7.9 days       | 10.8 h/day          | 12.2 gal/day        | 9.4 days       | 55%                | 28%          |
| 8 kW             | 16.8 gal/day | 7.9 days       | 15.1 h/day          | 17.1 gal/day        | 6.7 days       | 37%                | 2% more      |
| 10 kW            | 16.8 gal/day | 7.9 days       | 19.4 h/day          | 21.9 gal/day        | 5.2 days       | 19%                | 30% 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.