



DEFENDER OUTFITTERS

ORIGINAL FIELD GUIDE

THE DEFENDER EMERGENCY POWER STANDARD

Essential loads first. Capacity measured in watt-hours. Output matched to running and startup demand. A practical backup-power plan for outages, evacuation, vehicles, and workplaces.

CORE EQUATION

watts x hours = watt-hours

Size the system from each device label and measured runtime. Then verify the power source can handle total running output and the largest startup surge.

PRIORITIZE / MEASURE / SIZE / TEST / MAINTAIN

Version 1.0 | August 21, 2026 | Original work by Defender Outfitters

Copyright 2026 Cyber Atlas LLC d/b/a Defender Outfitters. Personal use is permitted. Redistribution or republication requires written permission.

Protect the mission, not every convenience.

Begin with the devices that preserve life, safe temperature, communication, information, lighting, refrigeration, and necessary work. A smaller verified load is easier to power longer and safer to test.

Medical and accessibility	List each critical device, battery, charger, prescribed operating schedule, backup procedure, and relocation trigger. Contact the manufacturer and care team before an outage.
Communication	Phones, radios, modem or router when service remains available, and a weather receiver. Include every charging adapter and cable.
Safe light	Use efficient LED task lighting. Avoid open flame and identify the minimum number of rooms or work areas that require light.
Cold storage	Refrigeration can be a priority, but measure its label and startup demand. Keep doors closed and use appliance thermometers.
Temperature and shelter	Fans, heated blankets, approved heating equipment, or relocation may be more practical than trying to power whole-home heating or cooling.
Water and sanitation	Include well pumps, transfer pumps, treatment devices, or other equipment only after confirming voltage, running output, and startup surge.
MEDICAL POWER IS ITS OWN PLAN	Do not treat a consumer power station as a guarantee of medical support. Confirm device compatibility and runtime, keep manufacturer-approved backup options, register for local assistance when available, and set an early relocation trigger.

Capacity, running output, and surge are separate limits.

Read the device nameplate, manual, or a suitable power meter. Do not use generic Internet wattage as the final number for your exact appliance.

ENERGY	watts x hours = watt-hours
DC ENERGY	volts x amp-hours = watt-hours
ESTIMATED RUNTIME	usable watt-hours / load watts = hours

Nameplate watts	Use listed watts. When only volts and amps are provided, volts x amps gives volt-amperes; confirm the actual watt demand and power-factor requirements for sensitive or motor loads.
Daily watt-hours	For every load, multiply verified watts by expected hours of operation. For cycling appliances, measure an actual representative cycle when practical.
Running output	Add the loads that may operate at the same time. The continuous inverter or generator rating must exceed that total with margin.
Startup surge	Compressors, pumps, and motors can briefly demand much more than their running load. Confirm the exact surge requirement and the source's surge duration.
Usable capacity	Advertised battery capacity is not the same as energy delivered at an AC outlet. Conversion loss, temperature, age, standby use, and discharge limits reduce runtime.

Write the plan before buying the system.

Use one row per exact device. Record the source of each value and test the finished plan with the actual equipment.

DEVICE	RUN W	SURGE W	HRS/DAY	WH/DAY	PRIORITY
Medical device	_____	_____	_____	_____	A / B / C
Refrigerator/freezer	_____	_____	_____	_____	A / B / C
Communications	_____	_____	_____	_____	A / B / C
Lighting	_____	_____	_____	_____	A / B / C
Fan or heat support	_____	_____	_____	_____	A / B / C
Pump or water	_____	_____	_____	_____	A / B / C
Other essential	_____	_____	_____	_____	A / B / C
Other essential	_____	_____	_____	_____	A / B / C

Plan totals

Daily energy

Total Priority A watt-hours/day: _____ Priority B: _____ Priority C: _____

Output

Maximum simultaneous running watts: _____ Largest verified startup surge: _____

Autonomy

Target hours or days without recharge: _____ Relocation or resupply trigger: _____

VERIFY VOLTAGE AND CONNECTION

A watt-hour total does not prove compatibility. Confirm AC voltage and frequency, outlet and circuit limits, DC connector polarity, grounding or bonding instructions, charging input, transfer equipment, and manufacturer restrictions.

Use complementary systems, not one vague promise.

SYSTEM	BEST USE	LIMITS TO VERIFY
Small power bank	Phones, small radios, lights, and USB devices.	Port and cable output, actual capacity, recharge time, storage temperature, and cell condition.
Portable power station	Quiet indoor battery power for compatible electronics and selected appliances.	Usable energy, continuous and surge output, waveform, grounding instructions, pass-through behavior, and charge rate.
Solar input	Recharging compatible batteries when adequate light, placement, weather, and time exist.	Voltage/current window, connector, controller, shading, temperature, panel angle, weather protection, and realistic daily harvest.
Fuel generator	Higher-output outdoor generation when fuel, safe placement, cords, and maintenance are available.	Carbon monoxide, fuel storage, noise, weather, grounding, load quality, maintenance, and safe building connection.
Vehicle charging	Limited mobile charging or compatible DC loads.	Vehicle starting reserve, alternator and outlet limits, ventilation, idling rules, cable rating, and carbon monoxide.

CERTIFICATION IS CLAIM-SPECIFIC

A portable power pack evaluated to UL 2743 is not automatically an installed residential energy-storage system. Follow the exact listing, product manual, electrical code, and qualified professional guidance for the intended use.

NEVER IMPROVISE A BUILDING CONNECTION

Never plug a generator into a household outlet. This backfeeding can energize utility lines and injure or kill workers and neighbors. A qualified electrician must install appropriate transfer equipment for building circuits.

Panel rating is not daily energy production.

Solar production changes with season, latitude, clouds, haze, shade, panel temperature, orientation, angle, dirt, cable loss, and charge-controller limits. Plan from a conservative measured day, not the box maximum.

Compatibility first	Confirm panel open-circuit voltage, operating voltage, current, polarity, connector, controller type, and the battery system's permitted input window before connecting anything.
Avoid partial shade	A small shadow can reduce output sharply. Plan a secure location that remains unshaded through the useful charging window.
Measure real harvest	Record watt-hours accepted by the power station during representative clear and poor-weather days. Compare this with the daily essential-load total.
Protect equipment	Use only equipment approved for the actual environment. Keep connectors clean and dry, secure panels against wind, protect cables from traffic, and follow lightning guidance.
Keep another recharge path	Multi-day cloud cover, smoke, damage, or evacuation can remove the solar layer. Maintain grid, vehicle, safe generator, replacement-battery, or relocation options as appropriate.

CONSERVATIVE SOLAR
CHECK

measured watt-hours harvested per day
must exceed essential watt-hours used per day

Battery power and fuel generation have different hazards.

BATTERY POWER STATIONS Use the supplied or approved charger and follow the manual. Keep ventilation openings clear. Protect the unit from water, crushing, puncture, heat, and incompatible loads. Stop using a unit that is swollen, leaking, unusually hot, damaged, smoking, or emitting an unusual odor. Keep it away from exits and combustible escape routes.	FUEL-BURNING GENERATORS Operate outside only, at least 20 feet from the home, with exhaust directed away from buildings and openings. Never use in a home, garage, basement, crawlspace, shed, porch, or enclosed space. Use working carbon-monoxide alarms. Keep the generator dry without enclosing it, and refuel only as directed after it cools.
---	---

Cords and loads	Use grounded, outdoor-rated cords of adequate gauge when required. Inspect for damage, protect connections from moisture, prevent trip and vehicle hazards, and do not exceed outlet, cord, branch, or system ratings.
Carbon monoxide alarms	Install and maintain alarms according to current CPSC guidance and manufacturer instructions. Symptoms can include headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. Move to fresh air and seek emergency help when exposure is suspected.
Fuel	Store only approved fuel in proper containers and locations, away from ignition and living areas, and follow fire code, product instructions, and local limits. Rotate and maintain it safely.
Transfer equipment	Only a qualified electrician should install or modify equipment connecting a generator or energy-storage system to building wiring. Never bypass interlocks or improvise adapters.

Test the plan while normal power is available.

- | | |
|----|---|
| 01 | Inventory exact devices, labels, batteries, chargers, cables, adapters, manuals, and spare fuses. |
| 02 | Measure each essential load and record simultaneous running watts and startup surge. |
| 03 | Charge every battery system, verify storage settings, and inspect for damage or recalls. |
| 04 | Power the Priority A load set for a realistic period and record actual watt-hours used. |
| 05 | Practice solar placement and measure energy harvested during representative conditions. |
| 06 | Stage a fuel generator at the safe outdoor location and verify cords, alarms, fuel, weather protection, and transfer procedure without backfeeding. |
| 07 | Test alerts, communications, low-battery triggers, refueling or recharge decisions, and the relocation threshold. |

COLD FOOD CLOCK

Ready.gov and FDA guidance use about four hours for an unopened refrigerator; a full freezer may hold temperature about 48 hours and a half-full freezer about 24 hours when doors stay closed. Use appliance thermometers, follow current food-safety instructions, and discard unsafe food - never taste it to decide.

DECIDE EARLY

Loss of medical support, unsafe indoor temperature, carbon-monoxide alarm, flooding, fire, damaged equipment, depleted fuel, failed refrigeration, or an official order can trigger relocation. Write the trigger and destination before the outage.

Original guidance, primary safety baselines.

This is original educational content created by Defender Outfitters. Primary sources support specific safety and planning concepts; no source sponsors or endorses this guide. Product manuals, local codes, qualified professionals, current recalls, and official emergency instructions control the exact installation and response.

CPSC - Generators and Engine-Driven Tools

cpsc.gov/Safety-Education/Safety-Guides/Carbon-Monoxide-Home/Generators-and-Engine-Driven-Tools

CPSC - Carbon Monoxide Information Center

cpsc.gov/Safety-Education/Safety-Education-Centers/Carbon-Monoxide-Information-Center

Ready.gov - Power Outage Information Sheet

ready.gov/sites/default/files/2024-08/ready.gov_power-outage_info-sheet.pdf

FDA - Food and Water Safety During Power Outages and Floods

fda.gov/food/buy-store-serve-safe-food/food-and-water-safety-during-power-outages-and-floods

OSHA - Using Portable Generators Safely

osha.gov/sites/default/files/publications/OSHA3286.pdf

U.S. DOE - Keeping Mobile Devices Charged

energy.gov/ceser/keeping-mobile-devices-charged

UL Solutions - Portable Power Pack Testing and UL 2743

ul.com/services/portable-power-pack-testing

SAFETY NOTE

This guide is educational and is not medical, electrical-engineering, code, fire-safety, or emergency-response advice. Follow current official instructions, the exact equipment manual and listing, applicable electrical and fire codes, and qualified professional guidance. Call emergency services for immediate danger.

Canonical current edition: defenderoutfitters.com/guides/emergency-backup-power-solar-generators

Copyright 2026 Cyber Atlas LLC d/b/a Defender Outfitters. Original work. Personal use is permitted. Redistribution or republication requires written permission.