

## ENGINEERED FOR SAFETY

*Lithium-iron has superior chemical and thermal stability. Getting the safest non-toxic chemistry and technology for an energy storage system is just as important as saving money when its job is to power and protect your home day and night.*

- Brent Willson (CEO)

### N14 ENERGY STORAGE

The NV14 is a complete energy storage system. It has a 7,680-Watt hybrid 120V/240V or 208V 3-Phase inverter, auto islanding (grid disconnect), Lithium Iron Phosphate (LiFePO4) battery system with 14.4 kWh of capacity, and comes all in one NEMA Type 3R cabinet (inside/outside installation). We include an Eaton sub-panel and input breaker as the system provides 32 Amps of continuous output power.

### SOLAR INTEGRATION

We accept up to 9,200 watts of Solar AC power (string or micro-inverter). We accept up to 8,448 Watts of DC solar (two MPPS with 5000 W, 500 V and 26 Amps maximum per MPPT (typically 9-10 panels per string)). Or, we can accept a combination of AC and DC solar up to 10,000 W combined.

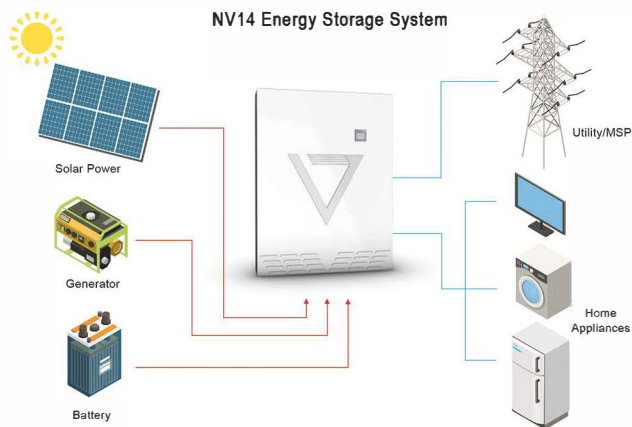
### NV24 ADDITIONAL CAPACITY

The NV24 adds 9.6 kWh energy storage to the NV14 for a total of 24.0 kWh of Lithium Iron Phosphate battery storage. It can be retrofitted to the NV14 at any time (NV14s installed in Dec 2019 or later). The NV24 takes 90 minutes to install. No additional inverter required.

### GENERATOR INTEGRATION

We can accept an AC generator that will power home loads and recharge the battery system when the grid is out IF the install has DC Solar.

We can accept an AC generator with AC Solar IF the generator is placed on a manual transfer switch in between the NV14 load output and the Eaton sub-panel. This configuration will only power the loads in the Eaton subpanel. This configuration will not recharge the battery system, but can easily extend how long the battery system will last.



## Basics of Operation

- Runs on AC, DC or AC and DC Solar
- Connect to DC solar installations without any external inverters or to AC solar installations via String or Micro inverter
- Seamlessly powers up to 16 breakers (120V) and 32 amps of continuous power through peak rates and grid outages. Higher loads can be added upon Amp study.
- Rapid anti-islanding ensures that even when the grid goes down, the customers' power remain uninterrupted.

### AC Solar

**Grid ON with AC Solar:** When the sun comes up in the morning, the inverter prioritizes the homes sub-panel loads. Once they are satisfied, "excess" solar is sent to battery system to recharge it. Once batteries are fully charged, "excess" solar is returned to the Main Service Panel (MSP)/Utility. Once sun begins to set, the battery will supplement the sub-panel. Upon sun set, the NV14 fully powers the sub-panel. NV14 powers loads via battery throughout the night until 20% battery is reached or until sunrise.

**Grid OUT with AC Solar:** When the sun comes up, solar is sent to sub-panel. "Excess" solar is sent to battery once home loads are satisfied. Once battery is at 95% full, the inverter turns the "grid" signal to the AC solar off. System is now powering the home loads on battery power. Once the battery depletes to 90%, a "grid" signal is returned to the AC solar system and solar production is returned. This process continues until the sun sets. This feature is required by Code. The battery runs the home sub-panel loads continuously until sunrise the next day and/or until grid power is returned.

### DC Solar

**Grid on with DC Solar:** When the sun arises, the inverter passes the DC solar through to the battery. Once the battery is FULL, "excess" DC solar is inverted to AC to charge the home loads. Once home loads are satisfied, "excess" solar is set to the MSP/Utility. This setup greatly increases the efficiency as you are inverting less often. Once sun begins to set, the battery will supplement the sub-panel and will eventually power the sub-panel once the sun sets. The NV14 powers loads via battery throughout the night until 20% battery is reached or until sunrise.

**Grid on with DC Solar:** When the sun comes up, solar is sent to battery for re-charging. Once the battery is full, DC solar is inverted to AC and sent to the home sub-panel. Once the sun sets, the battery runs the home sub-panel loads continuously until the sun rises the next day and/or until grid power is returned.

### AC & DC Solar

**Grid On with AC and DC Solar:** Grid on with AC and DC Solar: When the sun comes up, the inverter passes the DC solar through to the battery. AC solar will charge the home critical loads. Once home loads are satisfied, then "excess" AC solar is sent to the MSP/Utility. Once the battery is FULL, then "excess" DC solar is inverted to AC and sent to the MSP/Utility. Once sun begins to set, the battery will supplement the sub-panel and will eventually power the sub-panel once the sun sets. NV14 powers loads via battery throughout the night until 20% battery is reached or until sunrise.

**Grid Out with AC and DC Solar:** When the sun comes up, AC solar is sent to sub-panel. DC solar charges the battery. Once the battery is 95% full, then AC solar will be turned off until the battery discharges to 90%. However, DC solar will continue to be present until the sun sets. Once the sun sets, the battery runs the home sub-panel loads continuously until the sun rises the next day and/or until grid power is returned.

## Installation

- NV14 is 38" wide and needs four inches of clearance on both sides. The NV24 is 20" wide and needs four inches of clearance on both sides. The NV24 must be installed within 2 feet of the NV14.
- Installation takes 6-8 hours with trained install crew.
- NV14 has to be connected to a 125 Amp Service Panel Bus bar or larger as it requires a 32 Amp (40 Amp breaker) grid connection.
- NV14 must be installed inside if above 2500' in elevation or where the site will experience more than one consecutive day of below freezing temperatures. The NV14 also must be installed inside or must be shaded/protected if installed outside facing south or where summer ambient temperatures will exceed 120 degrees Fahrenheit.
- If installed inside, many Cities/Counties are requiring AC PV and load subpanel disconnects accessible on the outside.
- majority of Installer time is spend pulling circuits out of the MSP and into the provided Eaton sub-panel. It is critical to make sure that the correct neutral is pulled with associated positive. If two positives share a single neutral, then they are either pulled together or not pulled at all. This cannot be determined until time of install when the wiring work begins.
- Loads pulled into this sub-panel will not pay Time-of-Use (TOU) and will be powered grid on or grid off down to 20% remaining battery capacity.

## Installation - Critical load sub-panel

- NV14 provides 32 Amps of continuous output to the loads (up to 7,680 W). This is 54% more than some of our competitors. We typically like to see 16 breakers of the 15 to 20 Amp variety (120 V) breakers pulled into the sub-panel. Customers should pull their refrigerator, garage, WiFi, home office, kitchen, family room and other circuits that are important to them in a grid outage.
- Customers should pull other circuits to maximize TOU savings and/or limit grid outage impacts.
- 30 Amp breakers can be considered, but this will greatly reduce the total number of circuits that can be installed. If customer wants to pull a 30 Amp breaker, then installer MUST do an energy study/test to verify total amps. Remember, 32 Amps total is provided by the NV14.

