NEOVOLTA

All-In-One Modular ESS

NV Wave

Patented Modular Click-in Design



USER MANUAL

For support scan here

800.364.5464

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V2_08182026

Declaration

NeoVolta (hereinafter referred to as "NeoVolta") reserves the right to modify the frame dimensions, functionality, technical data, parameters, and/or standards without prior notice.

The contents of this manual have been checked in accordance with its described hardware and software. **However, the contents of this manual may be subject to appropriate modification because of a product upgrade, specification change, or other update of the manual; we cannot guarantee full accordance all the time.** The data in this manual is reviewed regularly, and any necessary corrections are included in subsequent editions. Suggestions for improvement from readers are appreciated. The latest version of this manual can be found at www.neovolta.com.

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Important Notes:

- Please ensure the security of the product enclosure and all safety covers before installation. Operations must conform to the requirements of this manual and local industrial safety regulations and/or electrical codes.
- Installation shall comply with the current version of the IFC, IRC, IBC, NEC or your state's equivalent codes.
- In the event of damage or loss of user manual, users can download a new copy online at www.neovolta.com.
- Contents of this manual may be subject to appropriate modification as a result of product upgrade(s), specification change, and update(s) to this manual
- If any item as stated in this manual is not clear, please contact our technical support department. 800.364.5464
- If any anomaly occurs after powering up or during the operation, it is essential to stop the ESS and identify the issue, or to seek technical support as soon as possible.

Technical Support

- Before installation, wiring, operation, and repair to the ESS and its components, please read and strictly comply with all the safety precautions in this manual. Please ensure all the warning marks on the NV Wave system and its components are clear and distinct.

- If you have any questions, or if anything is not clear about this product and its operation, contact us at 800.364.5464.



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1. Safety Information

The following types of safety instructions and general information appear in this document as described below:

1.1 Symbols Used

	"Danger" indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	"Warning" indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	"Caution" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	"Chemical Spill" indicates the presence of hazardous liquids.
	"Fire Risk" indicates the presence of materials that can ignite easily and burn rapidly if not stored or handled properly.
	"Note" provides tips that are valuable for the optimal operation of our equipment.

1.2 Important Safety Instructions

- Store this manual securely. When operating equipment, in addition to following the general precautions in this manual, follow the specific safety instructions closely. NeoVolta will not be liable for any consequences caused by violation of the safety operation regulations and design, production, and usage standards outlined herein.
- Unless otherwise specified, only accessories shipped with the ESS are recommended for use to reduce risk of fire, electric shock, or personal injury.
- Make sure the existing wiring is in good condition; wires should not be undersized.
- Do not disassemble any parts of the ESS. It contains no user-serviceable parts. See warranty for instructions on obtaining service.
- Attempting to service the ESS yourself may result in risk of electric shock or fire and will void your warranty.
- Keep away from flammable, explosive materials to avoid fire disasters.

- The installation location should be free from humidity or corrosive substances.
- Authorized service personnel must use insulated tools when installing or working on NV Wave equipment.
- CAUTION – RISK OF ARCING. Never remove a battery module or inverter module while the NV Wave is turned on and operating. Turn the NV Wave completely off including Mains and AC-Coupled solar system before working on the components.



DANGER — LETHAL VOLTAGE PRESENT AFTER SHUTDOWN
The NV Wave inverter modules contain capacitors that retain charge at potentially lethal DC voltage levels even after the MAINS, battery, and AC-PV inputs have been disconnected.

DO NOT open the inverter box or touch internal inverter connections until a minimum of 5 MINUTES has elapsed after full disconnection from all power sources.

Use a calibrated multimeter rated for ≥1100 VDC to verify voltage has fully dissipated before performing any work on inverter components.

- CAUTION-RISK OF ELECTRIC SHOCK. Prior to removing the NVWave cover and working on internal components or wire connections, be sure to turn off the NVWave and completely disconnect the unit from the Grid Supply and AC-Coupled Solar system. Wait 5 min. for the internal Capacitors inside the Inverter Modules to discharge.
- Lightning can cause damage from direct strike or nearby strike.
- Induced surges are most likely due to lightning damage in the majority of installations, especially in rural areas where electricity is usually provided by long overhead lines. Surges may be included on both the PV array conduction and the AC cables leading to the building.
- Specialists in lightning protection should be consulted during end use application. Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.
- Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with an external lightning protection system (LPS) when separation distance is kept.
- Anti-islanding Effect is a special phenomenon where a grid-connected PV system will still supply power to the nearby grid when the voltage loss has happened in the power system. It is dangerous for maintenance personnel and the public. Hybrid series inverters provide active frequency drift (AFD) to prevent the islanding effect.

1.3 Battery Safety Instructions

Batteries may pose potential electric shock and short-circuit current danger, to avoid these risks, the following warnings should be observed during battery handling and replacement:

1. Turn off the NV Wave by pressing the Function button and disconnecting all AC power sources to the unit

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WARNING — DC BUS REMAINS LIVE AFTER SHUTDOWN

Turning off the NV Wave using the Function button or disconnecting AC grid power does NOT de-energize the DC Bus or Transfer Power Rail (TPR). The battery modules continue to supply voltage to the TPR at all times while connected.

Before performing any work on battery modules, the TPR, or DC wiring:
- Press and hold the Function button for 10 seconds to power down the system.
- Disconnect AC grid power at the upstream breaker.
- Do not rely on the system being "off" as confirmation that the DC bus is safe.
- Use a calibrated multimeter to verify DC voltage at the TPR before touching any DC connections.
- Wear appropriate PPE: insulated gloves rated for the DC voltage present.

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2. Do not wear watches, rings or other metallic jewelry
3. Use proper personal protective equipment PPE
4. Do not place metallic tools or parts on the batteries
5. Only personnel with proper expertise can carry out the maintenance
6. To turn off, press and hold the Function button for 10 seconds

1.4 Important Battery Safety Notes

- Battery modules are shipped in a “sleep” state, per the Battery Management System, meaning they hold no voltage at the battery module terminals
- The battery module’s BMS will “wake up” at the initial battery discovery stage during the first boot sequence after installation
- Batteries cannot be removed while the NV Wave is turned on and running.
- When the battery is disconnected from the TPR, the BMS will go into “sleep” mode

1.5 Applying Power

Before applying power to the NVWave system

- Verify all connections are secure and properly torqued
- Ensure area is clear of personnel and tools.
  WARNING: Ensure the required overhead clearance for the Emergency Venting Area is maintained and kept clear.
- Close the main circuit breaker to energize system
- The NVWave AController will automatically detect and initialize components
- Verify system status LEDs indicate normal operation

1.5.1 On/Off Cycle

The Function button is located on left side of the enclosure.

1. Turn on the Grid supply to the NV Wave.
2. Press the Function Button for approximately 1-2 seconds. The NV Wave will display blue flashing LED lights, indicating that the unit is in the Initial State.
3. Press the Function Button a second time. The unit's LED lights will display a solid blue light as the NV Wave is in Battery Discovery Mode.
4. After the NV Wave completes Battery Discovery, the unit will display a solid green light, indicating it is in Grid Mode, i.e. normal operation.
5. To turn off the NV Wave, press and hold the Function Button for 10 seconds; you will hear a click and the LED lights will turn off, indicating that the unit is off.

1.5.2 Grid Outage Test

After powering the NV Wave on and achieving normal function, you must simulate a grid outage.

1. Turn off the Grid connection to the NV Wave. Within 2 seconds, the system's LED lights will turn pink, indicating it's in backup mode.
2. If the system does not enter backup mode upon disconnecting from the Grid, perform a Reboot Sequence.

If you see red flashing lights while performing a Grid Outage Test, check if your connected loads are not over the system max power output rating. If so, turn off large loads, such as air conditioning units. Restart the system by tuning it Off and back On, then perform this test again to ensure the system will enter Backup Mode if the Grid connection is interrupted.

1.5.3 Reboot Sequence

1. Push and hold the Function button for 10 seconds. You will hear a click, and all LED lights will go off. The unit is powered off when no LED lights show.
2. Power the unit back on by pushing the Function button once. The LEDs will flash in blue, indicating the system is in standby mode.
3. Press the Function button again to achieve a solid green light to indicate the system is functioning normally.

2. Product Description

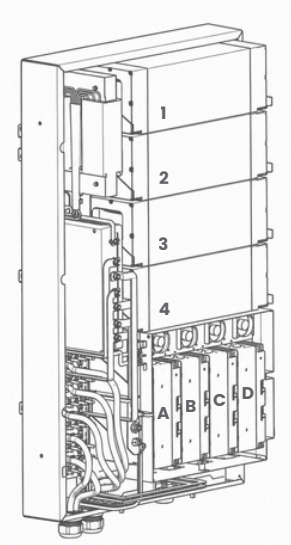
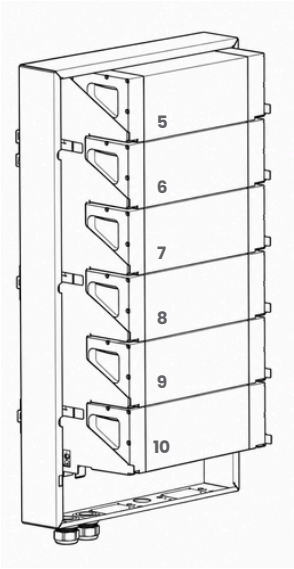
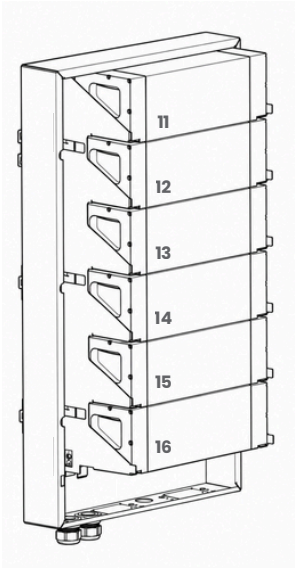
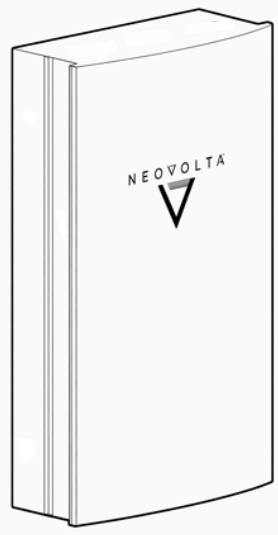
The NV Wave is described as a Residential Microgrid-Ready Energy Storage System (ESS) from NeoVolta. This modular and configurable system is designed to manage the entire home energy ecosystem with easy expansion, allowing it to grow with the owner's needs.

The NV Wave acts as the system controller for all home power sources, integrating and coordinating the various components including PV solar, generators, and EV chargers.

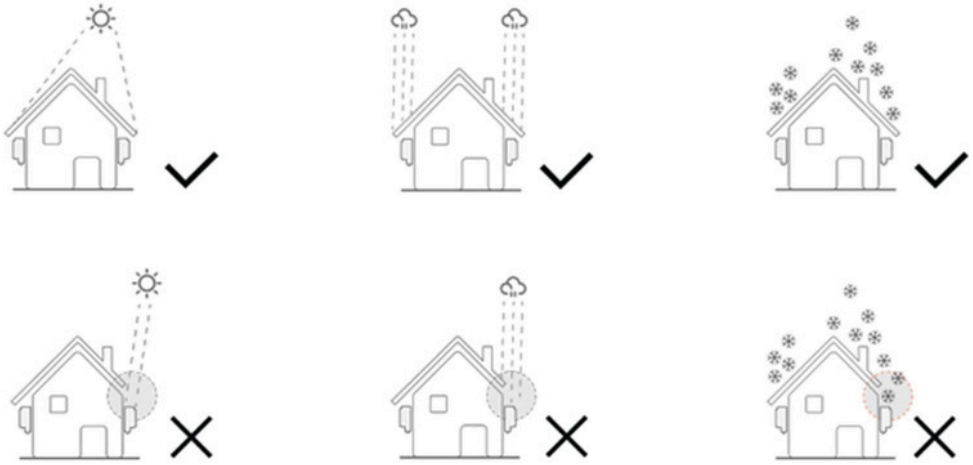
The NV Wave provides grid-forming capability and supports intentional islanding, giving homeowners backup power when utility grid power goes down. The scalable architecture of the NV Wave allows users to increase battery and inverter capacity without redesigning the system.

2.1 System Configurations

NV Wave configurations can include up to three enclosures:

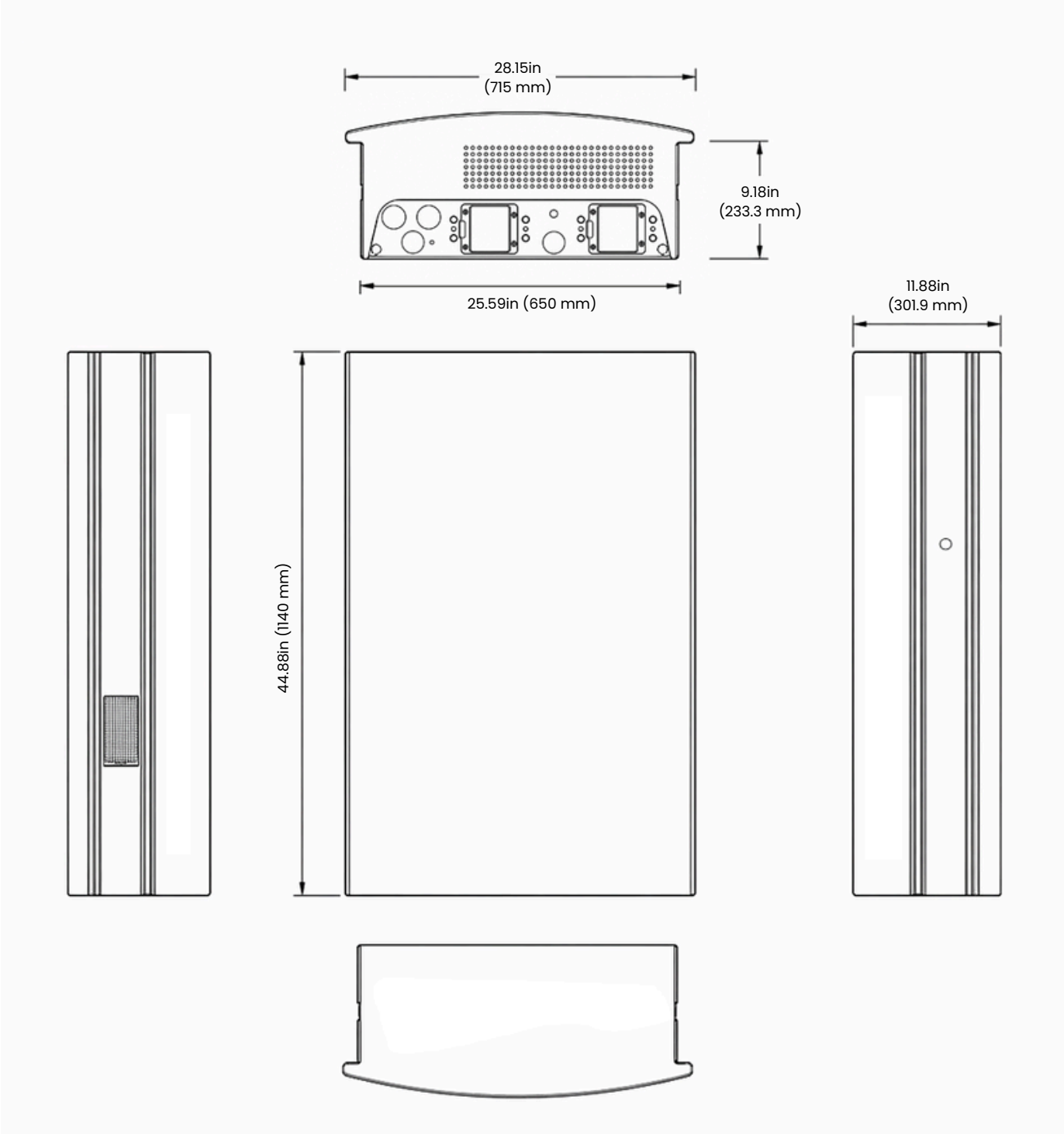
FIRST ENCLOSURE (3.45 - 13.8 kWh)	SECOND ENCLOSURE (17.25 - 34.5 kWh)	THIRD ENCLOSURE (37.95 - 55.2 kWh)	ENCLOSURE COVER (ONE PER ENCLOSURE)
			
BATTERY STORAGE **1** 3.45 kWh **2** 6.9 kWh **3** 10.35 kWh **4** 13.8 kWh	**5** 17.25 kWh **6** 20.7 kWh **7** 24.15 kWh **8** 27.6 kWh **9** 31.5 kWh **10** 34.5 kWh	**11** 37.95 kWh **12** 41.4 kWh **13** 44.85 kWh **14** 48.3 kWh **15** 51.75 kWh **16** 55.2 kWh	**INVERTER POWER** **A** 2.4 kW **B** 4.8 kW **C** 7.2 kW **D** 9.6 kW

2.2 Site Location



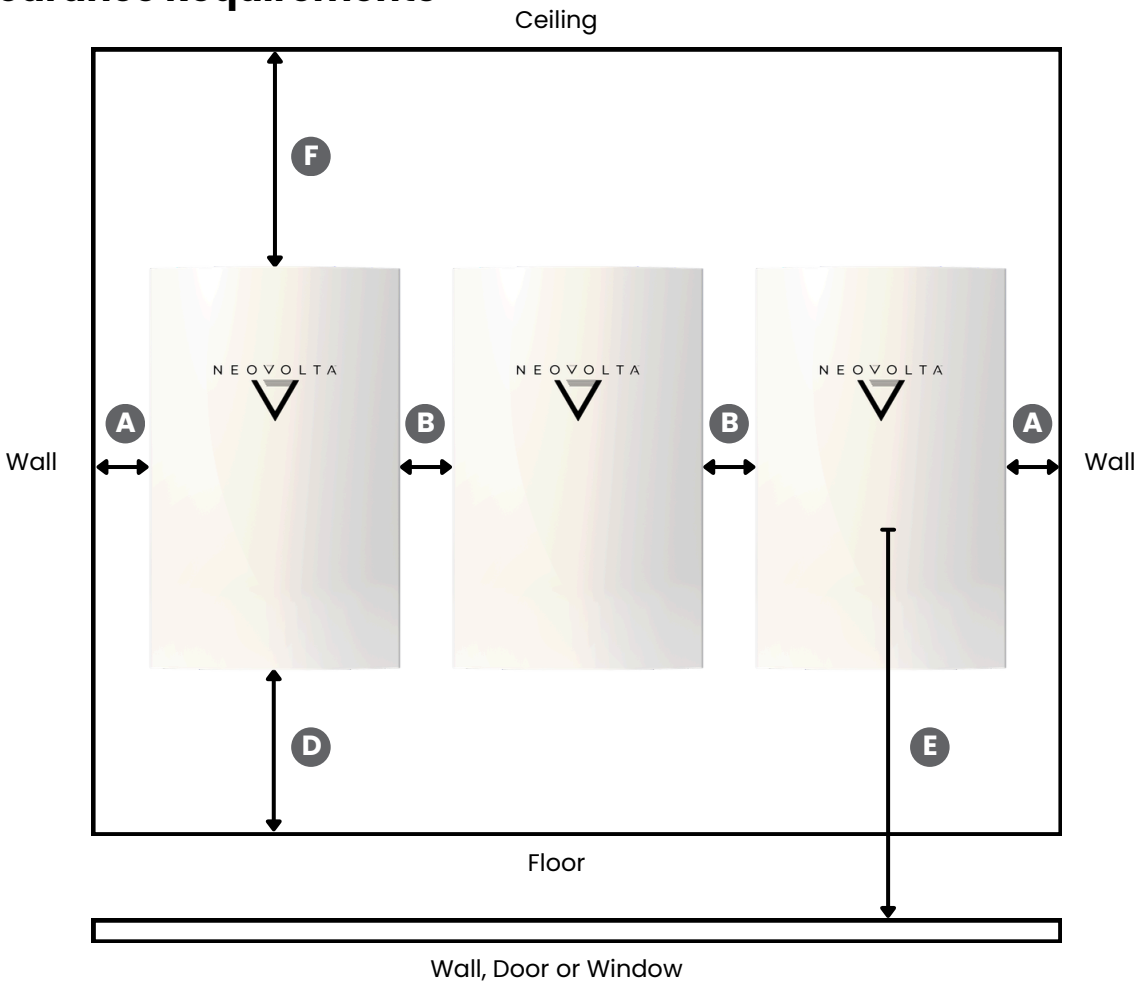
- Avoid excessive southern sun exposure that could raise the ambient temperature above the allowable 55°C (131°F).
- The NVWave is outdoor rated (NEMA 3R); however, ensure that roof runoff or concentrated rainwater does not fall directly onto the unit.
- Prevent excessive snow accumulation around the equipment. Make sure the unit is not positioned where roof snow avalanches could fall onto it.

2.3 Cabinet Dimensions



The NV Wave first, secondary, and third enclosures all have the same dimensions.

2.4 Clearance Requirements



A = Distance from the unit to the left wall:	A = 6 in (152.4 mm)
B = Distance from the unit to next unit:	B = 6 in (152.4 mm)
C = Distance from the unit to the back wall:	C = 0.5 in (11 mm)
D = Distance from the unit bottom to the floor:	D = 18 in (460 mm)
E = Distance from the unit front to exposures and means of egress:	E = 36 in (915 mm)
F = Distance from the unit top to the ceiling:	F = 24 in (610 mm)



Warning: Do not install shelving, storage, or obstructions above the unit
Venting Direction: UPWARD - maintain clear path.



Safety Note:

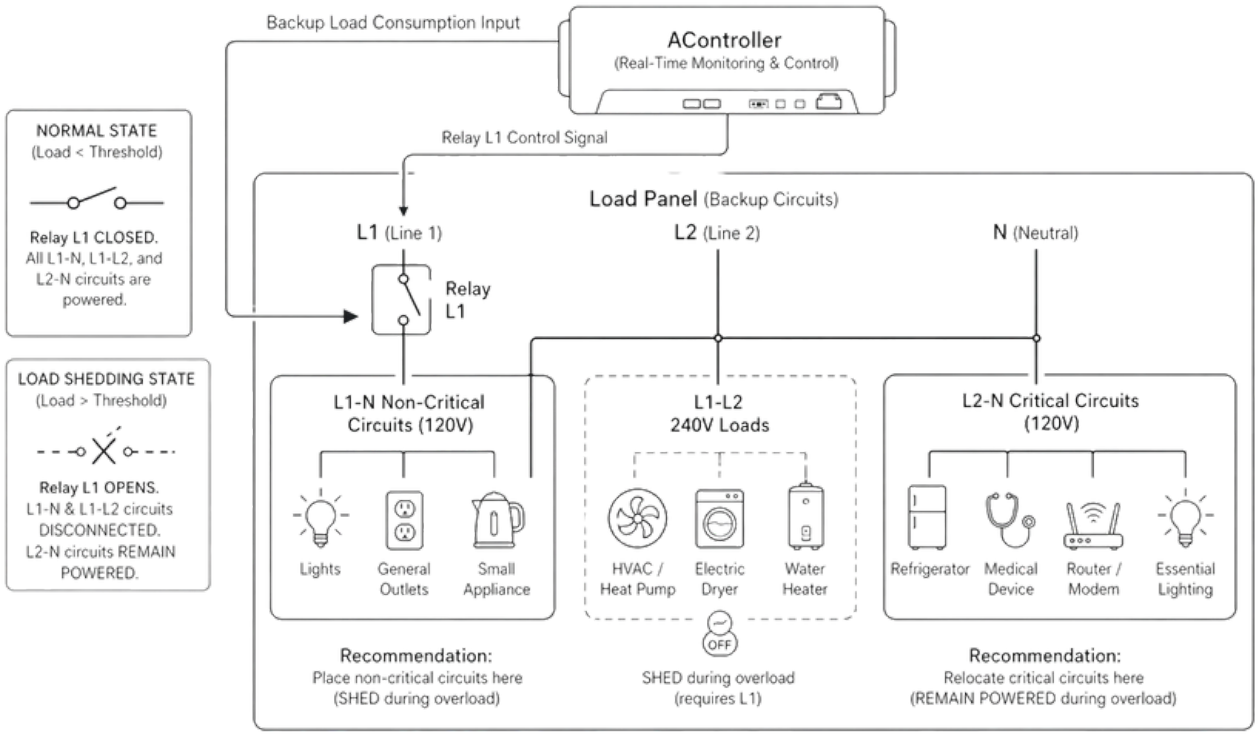
- The enclosure weighs approximately 50 lbs (23 kg) empty.
- Fully assembled, the NV Wave Main Enclosure will weigh approximately 466 lbs (215 kg). A battery-only enclosure weighs approximately 417 lbs (189 kg).
- The heaviest component weight is 55 lbs (25 kg). Use proper lifting techniques and adequate personnel during installation.

3. Load Management of Backup Load Circuits

The NVWave provides whole-house load management.

The AController continuously monitors the backup load consumption in real time. If the total continuous load exceeds the threshold, the AController will open relay **L1** on the load output. When this occurs, all **240V loads, L1-L2,** are disconnected and will stop consuming power. Additionally, any **120V circuits** connected to **L1-N** in the load panel will also be shut off. All circuits connected to **L2-N** will remain powered by the system.

Once the total backup load decreases and falls below the configured threshold, the AController will re-close **L1**, restoring both **240V to L1-L2** and **120V** power to L1-N circuits.



4. User Maintenance

The NV Wave is a modular energy storage system that requires minimal maintenance by owners. The following table includes routine maintenance tasks to be completed, and their frequency.

WARNING: The tasks below are limited to what an owner can safely perform without opening the NV Wave enclosure. The DC Bus/Transfer Power Rail remains live even when the system appears off (see Section 1.3). Any inspection, tightening, or service of internal cables, battery modules, or DC wiring must be performed only by a NeoVolta-authorized service technician.

Item	Method	Maintenance Interval
System Cleaning	Inspect and dust enclosure base and cover to prevent debris buildup	One to two times per month, depending on environment
Air Exchange Openings	Check the air exchange openings to ensure they are not covered or clogged. The NV Wave has two air exchange openings — an intake at the bottom vent and an exhaust vent on the right side (see Section 2.4, Clearance Requirements). Clear away dust, debris, leaves, snow, or any object blocking either opening, and do not place shelving, storage, or other obstructions in front of them.	Once per month (check sooner after storms, heavy pollen/debris, or snowfall)
System Status	Check for equipment damage or operation issues. Listen for any abnormal noises during the operation of the equipment.	Once every 3 months

Item	Method	Maintenance Interval
External Cable and Conduit Check	Visually inspect external cable entry points and conduit for damage, pest intrusion, corrosion, or wear, from outside the enclosure only. Do not open the enclosure or handle any internal wiring. If damage is observed, stop use of the affected circuit and contact NeoVolta Technical Support (800.364.5464).	Once per month
Internal Power, Battery, and Communication Cable Inspection	Internal cable and connection inspection, including torque verification, must be performed only by a NeoVolta-authorized service technician. Do not attempt this yourself — see Sections 1.2 and 1.3 for DC bus and arc-risk hazards.	Annually, or per a NeoVolta authorized technician recommendation

If you notice your NV Wave is system not functioning properly, please contact NeoVolta After Sales Support.



5. Emergency Procedures

5.1 General Emergency Guidance

- If you see fire, smoke, smell an unusual chemical odor, or notice leaking fluid from the NV Wave: evacuate the area immediately and call 911.
- Tell the dispatcher this is a residential lithium iron phosphate (LFP) battery energy storage system — this affects how fire crews approach the incident.
- Do not attempt to disconnect power or approach the unit if there is any visible fire, smoke, or leaking fluid.
- **Evacuating is more protective than trying to de-energize the system yourself: the battery modules retain stored energy whether or not external power is disconnected, and approaching a venting or burning unit exposes you to toxic gases and shock/arc-flash hazards.**
- Do not re-enter the area until released by the fire department AND the system has been inspected by a NeoVolta-authorized technician.

5.2 In Case of Fire

- Evacuate the area immediately and alert others nearby.
- Call 911. State that the incident involves a lithium iron phosphate (LFP) battery energy storage system.
- Do not attempt to extinguish the fire yourself. A standard fire extinguisher will not stop thermal runaway in a lithium battery.
- Do not approach the unit or attempt to disconnect power.
- Maintain a safe perimeter as directed by the fire department. Lithium battery fires can reignite hours after appearing extinguished (stranded energy) — do not re-enter the area until the fire department has released the scene and a NeoVolta-authorized technician has inspected the system.

5.3 In Case of Electrolyte Leak or Chemical Exposure

- Evacuate the immediate area and ventilate if possible.
- Avoid direct contact with any leaked fluid, residue, or vapor. It may be corrosive or toxic; if the leak followed a heat event, hazardous decomposition products (including hydrogen fluoride) may also be present.
- If skin or eye contact occurs, flush the affected area with clean water for at least 15 minutes and seek medical attention.
- Do not attempt cleanup yourself — contact a qualified technician or hazardous-materials responder.
- Do not resume operation until the source of the leak has been identified and repaired by qualified personnel.

5.4 Suspected Fault or Abnormal Behavior (No Visible Fire, Smoke, or Leak)

- If you notice a fault indication, unusual sound, or odor, but there is no visible fire, smoke, or leaking fluid: if you can safely reach the main circuit breaker without approaching or opening the NV Wave enclosure, you may disconnect power to the unit.
- If you are unsure, or cannot safely reach the disconnect, do not attempt it — contact NeoVolta Technical Support (800.364.5464), or evacuate and call 911 if conditions escalate.
- Do not restore power until the cause has been identified and resolved by qualified personnel.

5.5 Information for Emergency Responders

A system identification placard should be posted at the NV Wave enclosure (and/or main disconnect) identifying: battery chemistry (Lithium Iron Phosphate / LFP), total energy capacity (kWh), nominal DC voltage, and disconnect location. NeoVolta 24/7 technical support: 800.364.5464.



5.6 After an Incident

Do not restore power or re-enter the enclosure area until the fire department has released the scene AND a NeoVolta-authorized technician has inspected the system. A battery module involved in a fire or significant fault event may retain hazardous stored energy even after the incident appears resolved — do not attempt to inspect, move, or dispose of a damaged module yourself.

6. LED Indication States

The NV Wave LED strip contains the following indications:

LED Indication Patterns

System State	LED Color and Pattern
Standby State	Blue LED Color Flashing at 1 Hz
Standby State (during battery discovery)	Blue LED Color Constant
Grid Mode	Green LED Color Constant
Back-Up Mode	Pink LED Color Constant
Fault State	RED LED Color Flashing
Reset to Default	White LED Color 3 Flashes
Wi-Fi Connection Success	No Change in Indication
Wi-Fi Connection Failed	3 Flashes of Current State Color Every 20 sec.
E-Stop State	Yellow LED Flashing