NEOVOLTA

Inverter & Storage System

NV14

Headquartered in Poway, California since 2018

NV14

NV14 Energy Storage System Installation Manual

(with optional NV24 additional battery capability)

For support scan here

800.364.5464

NEOVOLTA.COM

V1.02042026

DECLARATION

NeoVolta. (hereinafter referred to as "NeoVolta") reserves the right to modify the frame dimensions, functionality, technical data, parameters, 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, and 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.

OTHER RIGHTS

IMPORTANT NOTES

Please ensure the intactness of the product enclosure and all safety covers before installation. Operation 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 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.

If any anomaly occurs after powering up or during the operation, it is essential to stop the machine and identify the fault or seek technical services as soon as possible.

TECHNICAL SUPPORT

Before installation, wiring, operation, and repair to the inverter, please read carefully and strictly comply with all the safety precautions in this manual. Please ensure that all the warning marks on the inverter are clear and distinct. Replace or add missed warning marks.

If you have any question, or anything that it is not clear for you during installation, wiring, and/or operation, contact us at 800.364.5464

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Safety Information

1.1 Symbols Used in Manual

WARNING:
This indicates a fact or feature that is very important for the safety of the user to prevent injury or death and/or which can cause serious hardware damage if not applied appropriately.

CAUTION:
Presents information to prevent damage to this product

1.2 General Safety Warnings

WARNING:
Do not attempt to self-install the NV14 Energy Storage System. Only a qualified solar installation professional or electrician may install and commission NeoVolta energy equipment. Contact NeoVolta for a list of authorized installers in your region.

SHOCK RISK: HIGH VOLTAGE ELECTRICITY

WARNING:
Before installing the NV14 Energy Storage System, read all instructions and caution markings in this installation manual.

WARNING:
Electrical installation in the United States shall be done in accordance with all local electrical codes and/or the National Electrical Code (NEC), ANSI/NFPA 70.

WARNING:
Connecting the NV14 Energy Storage System to the electric utility grid must only be done after receiving prior approval from the utility company and installation completed only by qualified personnel/licensed electrician(s).

WARNING
This equipment is NOT intended for use with life support equipment or other medical equipment or devices.

WARNING
For continued protection against risk of fire, use only replacement fuses with the same type and rating as the original parts.

1.3 Safety Instructions

This chapter contains important safety and operating instructions. Read this chapter thoroughly and maintain this manual for future reference.

CAUTION:

Before using the NV14 Energy Storage System, please read the instructions and warning signs of the battery and corresponding sections in the instruction manual.

WARNING:

Do not disassemble the NV14 Energy Storage System. If your system needs maintenance or repairs, contact an authorized NeoVolta service dealer. Improper reassembly may result in electric shock or fire.

WARNING:

To reduce the risk of electric shock, disconnect all wires before attempting any maintenance or cleaning.

CAUTION:

Strictly follow the installation procedures for disconnecting the AC or DC terminals. Refer to the installation section of this manual for the details

WARNING:

The NV14 Energy Storage System must be connected to a permanent grounded wiring system.

CAUTION

Disconnect all smart batteries and set them to ‘sleep mode’ before servicing the inverter or touching electrical terminals. Refer to the smart battery documentation for complete safety instructions.

CAUTION:

Be very careful when working with metal tools on or around batteries. Dropping a tool may cause a spark or short circuit in batteries or other electrical parts. Additionally, risk of battery explosion is possible.

WARNING:

PV modules produce direct current (DC) when exposed to light and under load. DC can sustain electrical arcs across gaps, which may cause serious injury or death. Do not connect or disconnect any wiring to the NV14 Energy Storage System while PV modules or any external DC source is energized.

2 Product Description

2.1 Product Overview

This is a multifunctional inverter, combining the functions of the inverter, solar charger, and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers users configurable and easily accessible button operations such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

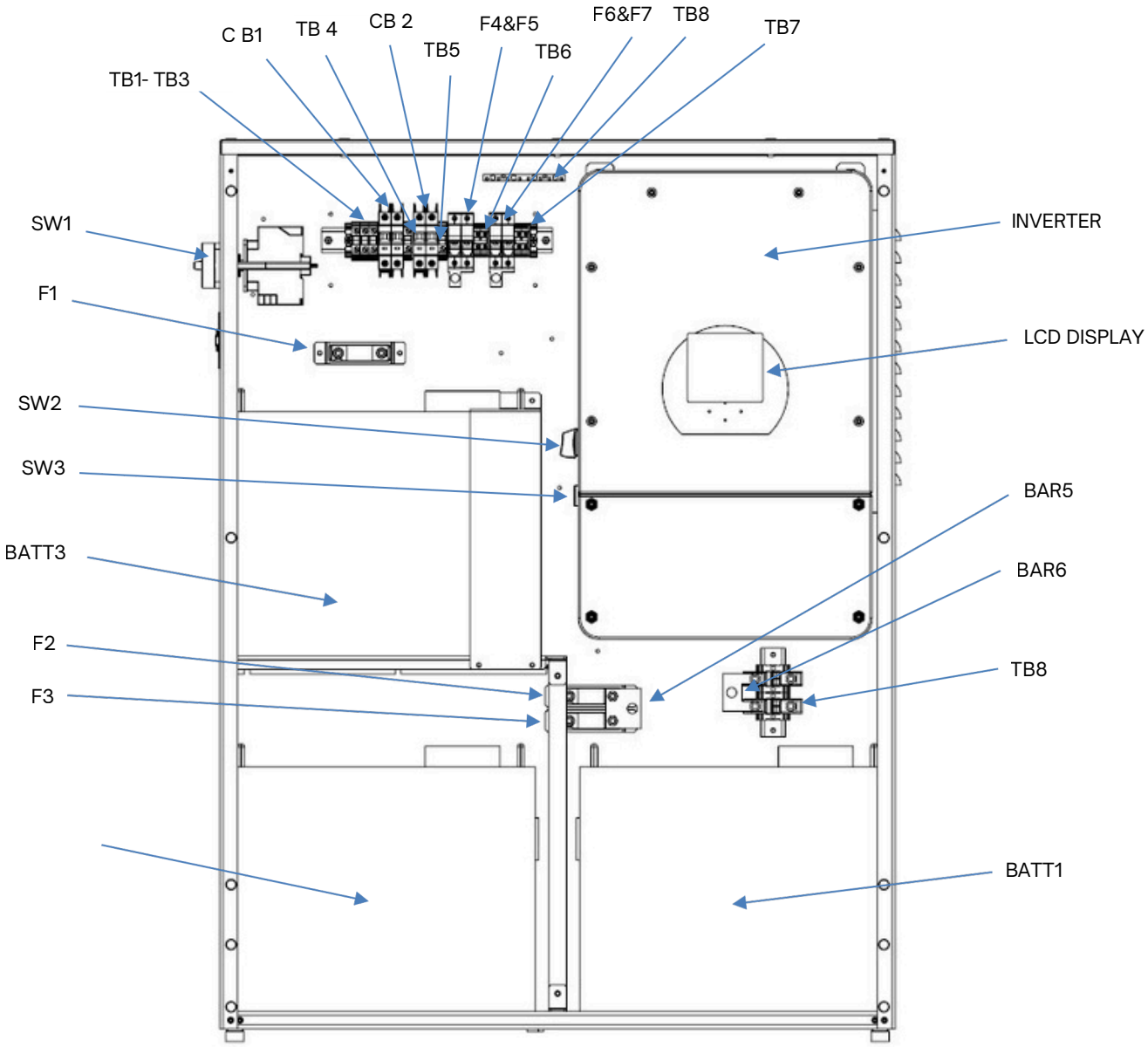


Figure 1

Component Locations (Figure 1)

SW1	System Disconnect Switch	BATT1	Battery
CB1	Grid Input Circuit Breaker	BATT2	Battery
TB1	Grid Input Neutral Terminal	BATT3	Battery
CB2	PV AC, or Generator Input Circuit Breaker	F1	BATT1 Fuse '+'
TB2	PV AC, or Generator Input Circuit Breaker Neutral Terminal	F2	BATT2 Fuse '+'
		F3	BATT3 Fuse '+'
CB3	Output Circuit Breaker	TB6	Ground Bar
TB3	Output Neutral Terminal	SW2	Inverter ON/OFF Switch
F4-F5	PV1 '+' Input Fuses	SW3	Inverter DC Bus ON/OFF Switch
TB4	PV1 '-' Input Terminal	BAR5	Battery '+' Junction Battery '-'
F6-F7	PV2 '+' Input Fuses	BAR6	Junction Battery '-'
TB5	PV2 '-' Input Terminal	TB8	Junction Terminals

2.2 System Architecture

The following shows the basic architecture of the NV14 Energy Storage System with the various devices that serve as acceptable interfaces for the system (Figure 2).

The authorized installer is responsible for determining the required devices and interface specifications for each installation site.

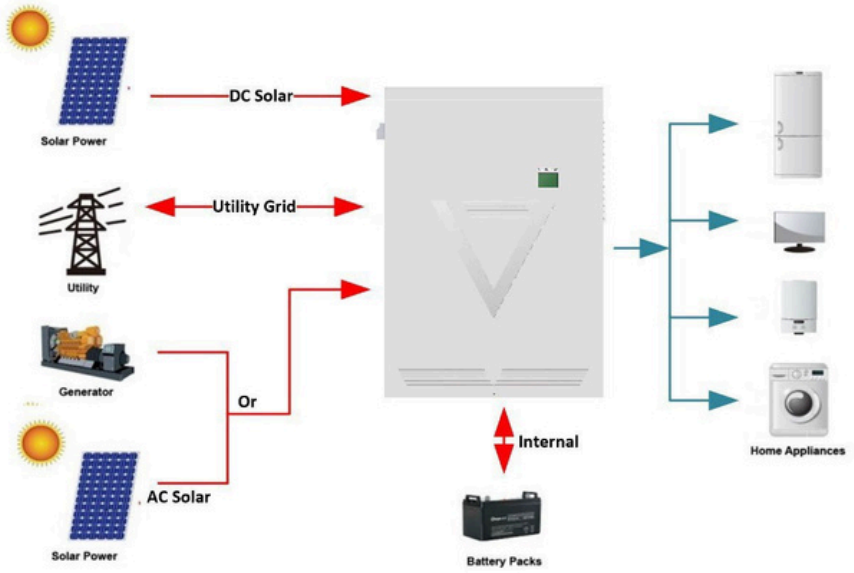


Figure 2

3 Tools and Materials

- Digital Voltmeter
- AC/DC Clamp-on Current Meter
- Drill + 3/8” Drill
- Tape Measure
- Stud Finder
- Hand Cart
- Screw Drivers (Philips and small blade)
- Socket wrench with 9/16” socket
- Code-compliant conduit and wire
- 5/32” (or 4mm) Hex key tool

4 Unpacking

4.1 Parts List

The NV14 Energy Storage System is delivered in 2 separate packages:

- Cabinet
- Three (3) individual batteries
- Installation Kit
  - Wall Mounting Bracket (2) 3/8 x 2”
  - Lag Bolt (4)
  - 3/8 Flat Washer (4)
  - 2.4 and 5.0 gHz Wifi Data Logger
  - 10 ft Wifi Extender Cable
  - White Screw Caps (10)
  - Bag of cable clips and Wi-Fi
  - mounting screws
  - Abbreviated Installation Manual
  - Solarman Wifi Installation Manual
- Critical load panel with 40A back feed breaker

4.2 Preparing Cabinet for Installation

WARNING

The NV14 Energy Storage System cabinet, without batteries, weighs 265 lbs. Or 114kg.

Move the cabinet, as shipped, as close to the installation site as possible.

- Remove the front cover; set aside for future use.
- Remove the lower front cover; set aside for future use.
- Stand the cabinet upright; remove the Accessory Box and Sub-Panel and set aside.

WARNING:

The cabinet, without batteries, is top heavy. Ensure the cabinet is properly supported and does not tip over until it is secured in its permanent location.

The NV14 Energy Storage System cabinet has four (4) conduit landing locations identified by ¼" (6.35mm) diameter indentations in the upper left side and (2) on the middle right side of the enclosure (refer to Figure 4). It is the responsibility of the installer to determine the best location to punch for conduit knockouts.

4.3 Preparing Batteries for Installation

WARNING:

BATTERIES ARE HEAVY. Each battery weighs approximately 96.5 lbs or 43.8kg. Two (2) persons for lifting and placement is strongly recommended to prevent personal injury.

Each battery is shipped in a separate package. Remove the battery from its packaging and set it upright near the installation location.

4.3.1 Battery Unique ID Setting

The battery has a 6-position dipswitch that requires adjustment prior to connecting it to the NV14 Energy Storage System. The position of the four (4) left-most dipswitch pins determine the Battery ID within the overall system. Each battery must have a unique ID. Note: Dipswitches 5 & 6 are not to be used and should remain in the down OFF position.

The suggested dip switch settings are as follows:

NV14 Cabinet:

Battery 1 (Position 2):

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6		ID
ON	OFF	OFF	OFF	OFF	OFF		2

Battery 2 (Position 3):

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6		ID
OFF	**ON**	OFF	OFF	OFF	OFF		3

Battery 3 (Position 4):

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6		ID
ON	**ON**	OFF	OFF	OFF	OFF		4

Optional Battery Cabinet NV24:

Battery 4 (Position 5):

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6		ID
OFF	OFF	**ON**	OFF	OFF	OFF		5

Battery 5 (Position 6):

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6		ID
ON	OFF	**ON**	OFF	OFF	OFF		6

4.3.2 Battery Sleep Mode

Each battery is shipped in ‘sleep mode’ meaning that no voltage is present at the battery terminals. When a battery is in sleep mode, all indicators are unlit. Note: “Sleep Mode 1” means that the BMS is turned off. If a battery ‘wakes up’ prior to installing, place it into sleep mode by pressing the reset button for 6 seconds. The battery reset button can be pressed using any thin, solid material, such as the end of a provided paper clip, (See Figure 3).

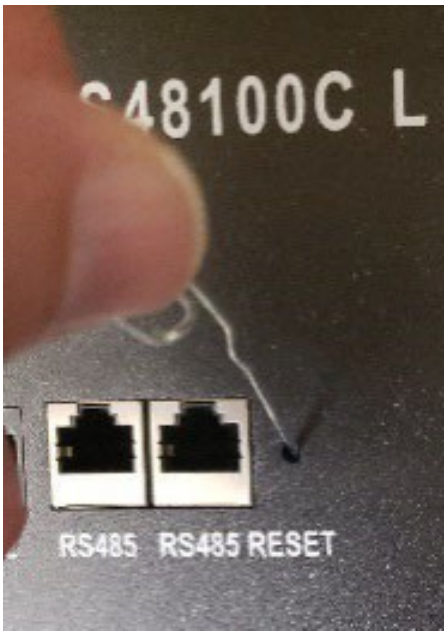


Figure 3

5 Installation Requirements

5.1 Site Location and Prep

The NV14 Energy Storage System can be installed indoors, such as in a garage, or mounted outdoors using a concrete, pre-formed pad, or pavers. The cabinet is a NEMA Type 3R rated cabinet suitable for outdoor use.

5.1.1 Cabinet Dimensions

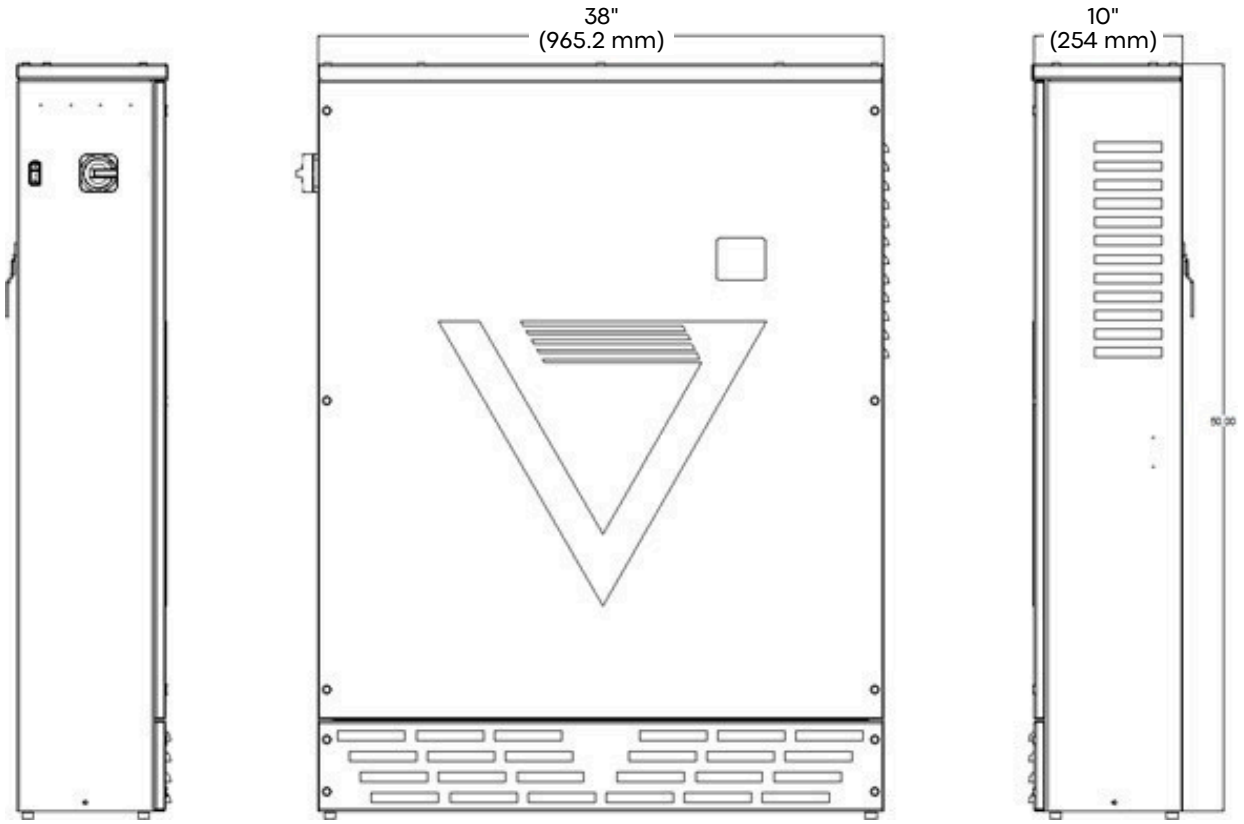


Figure 4

5.1.2 Clearance Requirements

The NV14 Energy Storage System requires clearance for cooling and service access. The cabinet must be installed with 4” (102mm) clearance on right side, 4” (102mm) on SW1 switch side and 36” (914mm) clearance to the front. There is no vertical clearance requirement other than not to use the top as a shelf for storage (either temporary or permanent).

The NV14 and NV24 energy storage systems are UL 9540 certified and require a minimum clearance of 4” (102 mm) between units. While this spacing does meet the certification requirements, installers must comply with all application local codes and the Authority Having Jurisdiction (AHJ) guidelines to ensure proper installation and safety.

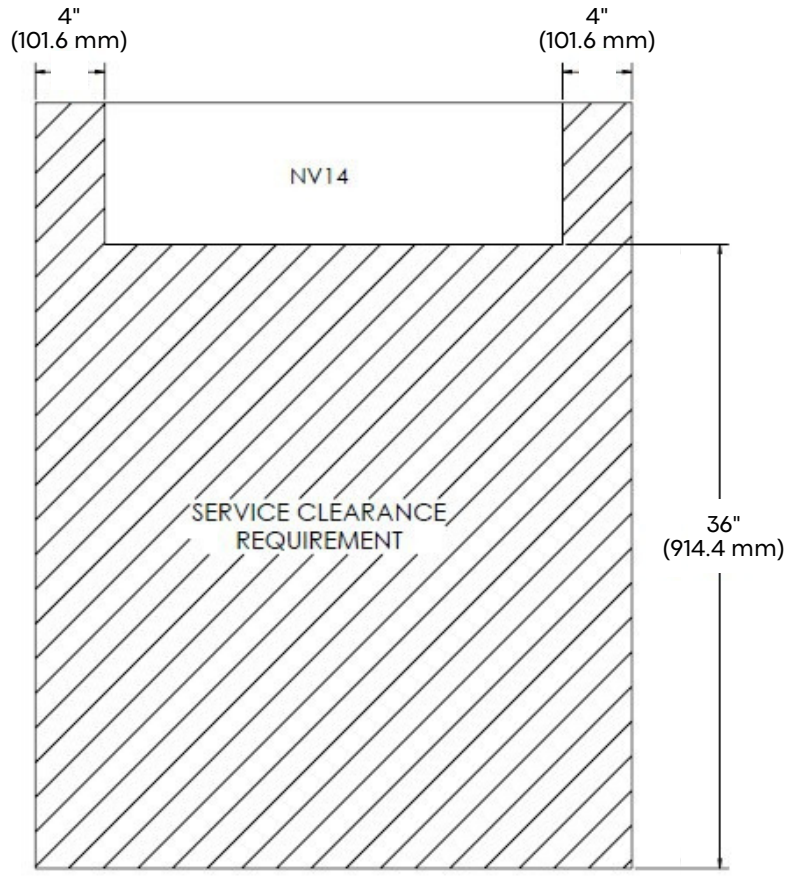


Figure 5

5.1.3 Backup Loads Panel

All installs must have a backup loads panel installed that consists of the backup load circuits needed in case of utility grid failure or power loss. The NV14 will provide power to the backup loads panel. All neutral wires for each backup load circuit must be isolated from the main service panel and installed on the backup loads panel neutral bar. The backup loads panel neutral bar must be wired to the NV14 Output Load Neutral terminal block.

WARNING:
Electrical installation in the United States shall be done in accordance with all local electrical codes and/or the National Electrical Code (NEC), ANSI/NFPA 70.

WARNING:
Failure to install critical load box correctly could result in poor power quality (such as flickering lights) and possibly unsafe ground loops.

5.1.3.1 Backup Load Circuits

It is not possible to detail all possible loads that must be removed from the main service panel and installed on the backup loads panel. Pull up to fourteen 15 /20 Amp (120V) breakers from the main panel to the backup loads panel. Some of the general guidelines to follow are:

- Refrigerator, small kitchen appliances, garage, home office with WiFi router, entertainment area (DVR and/or Television, and lighting circuits
- All 120V receptacle circuits
- Any Low Power or Low Use circuits needed under emergency conditions

If the installer wants to backup a 30 Amp breaker, then the installer MUST do an energy study/test to verify the total amps backed up. The NV14 provides 32 Amps total of continuous output to the loads. Be sure to consider any start up Amps for all motors/compressors/pumps.

Do not include non-essential circuits that could drain batteries quickly, such as:

- Air Conditioner
- Electric Dryer
- Electric Water Heater
- Pool and/or Jacuzzi
- 240V Electric Vehicle Charger
- Other 240V circuits

WARNING:
When moving breakers to backup loads panel, do not split branch circuits that share the same neutral. Either move both breakers with a shared neutral to the backup loads panel or do not move either one. Never move one breaker of a branch circuit with a shared neutral and not the other. Unsafe conditions could occur and may damage the inverter or

5.1.4 Indoor Location Preparation

The NV14 Energy Storage System must be installed on a rigid, flat level surface capable of supporting the full weight of the cabinet. If installed inside a garage, it may be necessary to raise the NV14 above the garage concrete sill to allow the NV14 to be placed flush against the garage wall. If a raised platform is used, it must be level and sturdy enough to support the full weight of the NV14 (575lbs/ 260.81kg). The raised platform must extend beyond the NV14 cabinet by 3” or 76.2mm on both sides and front (See figure 6).

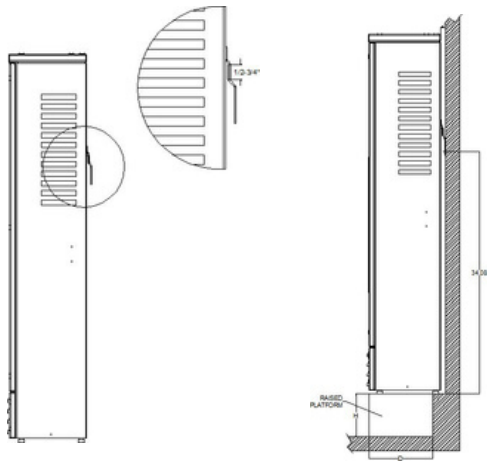


Figure 6

5.1.5 Outdoor Location Preparation

The NV14 Energy Storage System may be installed in an outdoor location against a wall – preferably under an eave. The NV14 Energy Storage System must not be installed on a south or west facing wall, if the temperature is routinely over 120 °F (49 °C) to prevent possible overheating and a shortened battery life. If installed outside on south or west facing wall and ambient temperatures are routinely over 120 °F (49 °C), installers are encouraged to shade the NV14 Energy Storage System.

The NV14 Energy Storage System must be installed on a rigid, flat level surface capable of supporting the full weight of the cabinet. A concrete surface, pre-cast concrete pad, or cement pavers are highly recommended. If using a pre-cast pad, the pad must be a minimum of 2” (51mm) thick and overhang the cabinet by 3” (76.2mm) on both the sides and front.

Note: The NV14 Energy Storage System shall not be installed outside if above 2,500 ft (762 m) in elevation or if more than two consecutive nights are below freezing temperatures, battery will not charge or discharge until it warms up, which can take a while. If the ambient temperature is outside the operating temperature of the system range for charging Temperature 32 °F ~ 113 °F/ 0 ℃ ~45 ℃ (Optimum 59 °F ~ 86 °F/ 15 ℃ ~30 ℃) and for Discharge Temperature -4 °F ~ 122 °F / -20 °C ~ 50 °C (Optimum 41 °F ~ 113 °F / 5 °C ~ 45 °C). If the system is installed at locations outside the operating temperature range, it is recommended to install the system inside a conditioned space

5.1.6 Securing the NV14

The NV14 Energy Storage System must be installed using the wall mounting brackets and hardware provided. The wall mounting brackets must be anchored to a minimum of two (2) vertical wall studs (See figure 7). 3/8" x 2 ½" lag bolts with washers must be used to attach the wall mounting bracket to the vertical studs. This bracket is not intended to support the weight of the NV14 or NV24. Instead, it is intended to prevent a tip-over hazard.

Position the Wall Mounting Bracket so that the top of the upper lip is approximately ½"-¾"(13mm-19mm) higher than the cabinet mounting bracket lower lip (See figure 6). The cabinet is equipped with leveling feet for minor height adjustments as needed. A leveling foot adjustment tool is provided.

When an adequate installation site has been prepared, position the NV14 Energy Storage System cabinet against the wall. Lift the cabinet up a few inches to clear the wall mounting bracket. Lower the cabinet so that the cabinet mounting bracket mates with the wall mounting bracket. Adjust the leveling feet as needed to ensure that all four (4) leveling feet are touching the floor or concrete slab.

CAUTION:

All four leveling feet must be firmly on the surface. Do not 'hang' the cabinet solely from the wall mounting bracket.

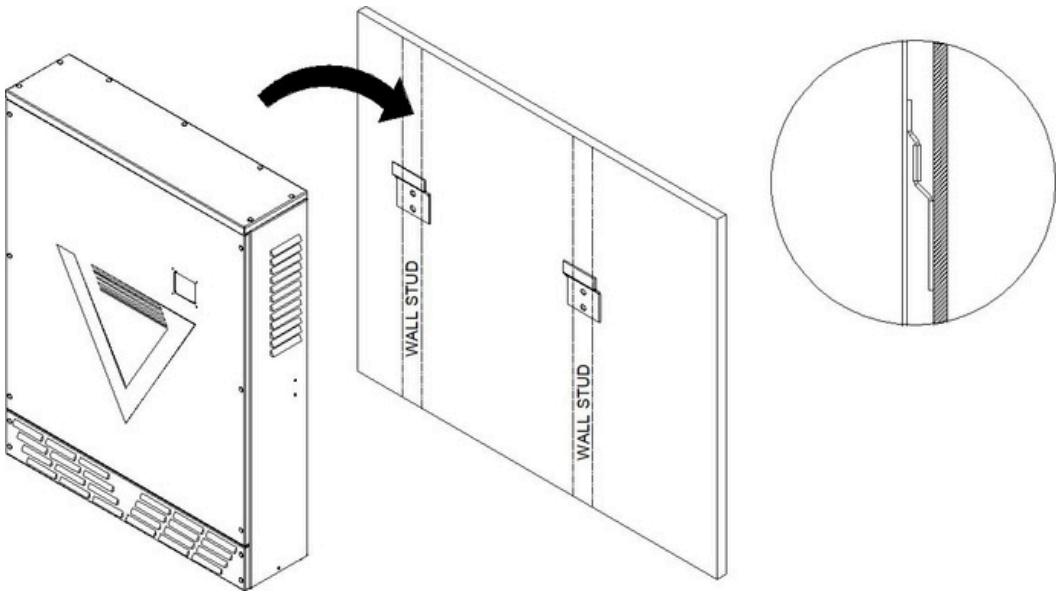


Figure 7

5.2 Optional Battery Cabinet Installation

5.3 Site Location and Prep

The NV24 Optional Battery Cabinet can be installed indoors, such as in a garage, or outside on a concrete, pre-formed pad, pavers or bricks. The cabinet is a NEMA 3R rated cabinet suitable for outdoor use.

5.3.1 Battery Cabinet Dimensions

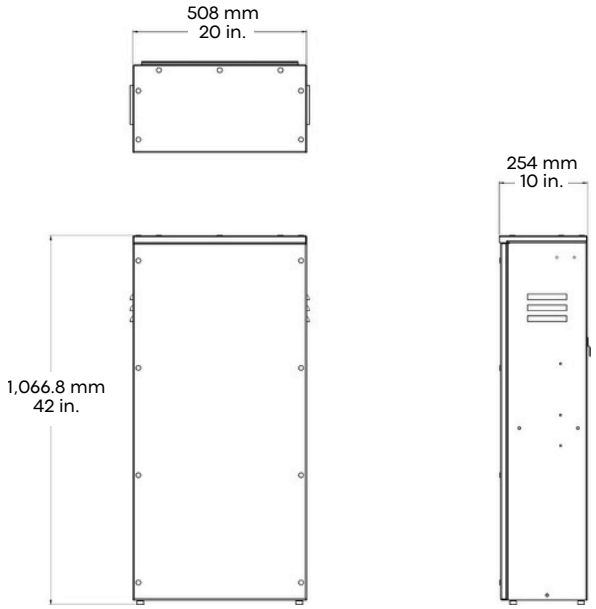


Figure 8

5.3.2 Location Preparation and Securing the Optional Battery Cabinet

The NV24 Optional Battery Cabinet must be installed in a similar fashion to the NV14. Refer to sections 5.1.4 and 5.1.5. The NV24 Optional Battery Cabinet must be installed using the wall mounting bracket and hardware provided. The total weight of the installed NV24 Unit is 122.5kg or 270lbs.

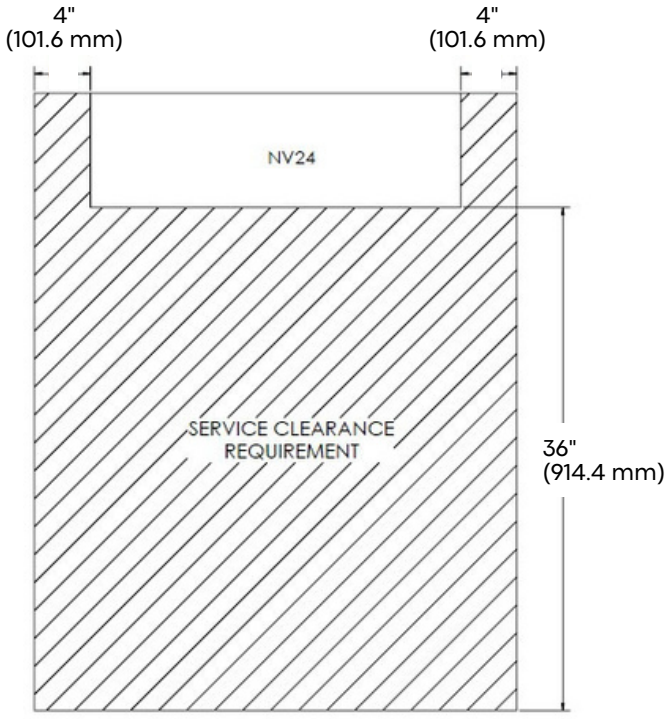
The wall mounting brackets must be anchored to the vertical wall studs similar to the installation of the NV14 (See figure 7). 3/8” x 2 ½” lag bolts with washers must be used to mount the wall mounting bracket to the vertical studs.

This bracket is not intended to support the weight of the NV14 or NV24. Instead, it is intended to prevent a tip-over hazard. The NV24 Optional Battery Cabinet has four (4) conduit landing locations identified by ¼” (19mm) diameter indentations in the top right side and top left side of the enclosure (refer to Figure 8). It is the responsibility of the installer to determine the best location to punch for conduit knockouts.

5.3.3 Clearance Requirements

The NV24 Optional Battery Cabinet requires clearance for cooling and service access. The cabinet must be installed with 4” (102mm) clearance on each side and 36” (914mm) clearance to the front. There is no vertical clearance requirement other than not to use the top as a shelf for storage (either temporary or permanent).

The NV14 and NV24 energy storage systems are UL 9540 certified and require a minimum clearance of 4” (102mm) between units. While this spacing meets certification requirements, installers must comply with all applicable local codes and the Authority Having Jurisdiction (AHJ) guidelines to ensure proper installation and safety.



6 Electrical Connections

6.1 Wiring

WARNING

Verify all source power is OFF or disconnected prior to wiring the NV14 Energy Storage System

CAUTION:

The following wiring information contains general wiring connections within the NV14 Energy Storage System. These instructions are not intended to describe all possible residential configurations. It is the responsibility of the NeoVolta authorized installer to determine the wiring requirements, codes, and safety standards at the specific site. The NV14 Energy Storage System has three (3) possible input locations and one (1) output location. Allowed input sources are:

- Utility Grid: 120/240VAC split single phase with neutral
- DC PV: A maximum of four (4) DC PV inputs with each input protected with 25A fuses
- AC PV or Generator: 240VAC input. Either AC PV source or Generator Source is permitted, but not both; Maximum AC PV input is 8360 Watts
- Output is 120/240VAC split phase with neutral (same as utility grid)

WARNING:

Verify the disconnect switch and all circuit breakers in the NV14 Energy Storage System are in the OFF position prior to making wiring connections.

6.1.1 Utility Grid Connection

Use copper wire only. The minimum wire size that can be used is 8AWG. The maximum wire size that will fit in the terminals is 6AWG. Connect the 120/240V wires from the utility to the top of TB1 (L1 & L2). Torque to 25 in-lb. (2,8Nm). Connect the 120/240V neutral wire from the utility grid to the top of TB1. Torque to 25in-lb. (2,8Nm). Refer to Figure 10 below for location of TB1 wiring locations.

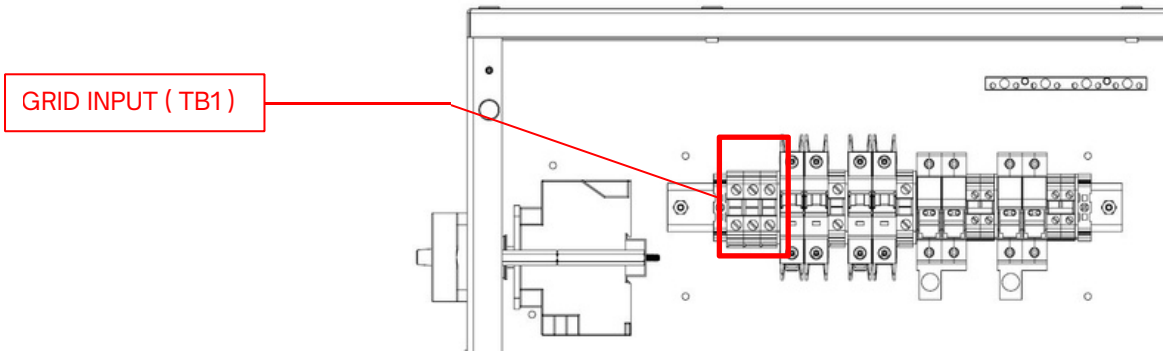


Figure 10

6.1.2 PV1, VDC Connection (PV2, VDC Connection, if present)

Use copper wire only. The minimum wire size that can be used is 10AWG. The maximum wire size that will fit in the terminals is 6AWG. Connect the PV1 '+' wires from the VDC PV source to the top of fuse F1 or F2. Torque to 25 in-lb. (2,8Nm). Connect the PV1 '-' wire from the VDC PV source to the top of TB4. Torque to 25 in-lb. (2,8Nm). Refer to Figure 11 below for the location of PV fuses and terminal wiring locations.

The NV14 has 2 MPPTs. Each MPPT can accept up to 500V, 25A, and 5,700W. Each MPPT has a max Voc of 500V (this Voc is based on the coldest ambient temperature of the installation location). Preinstalled in the fuse holders are Type SPF 25A/ 1000VDC from the LIttlefuse. The max allowable PV for both MPPTs is 11400Watts, it is recommended to divide the total PV as equally between the MPPTs as possible.

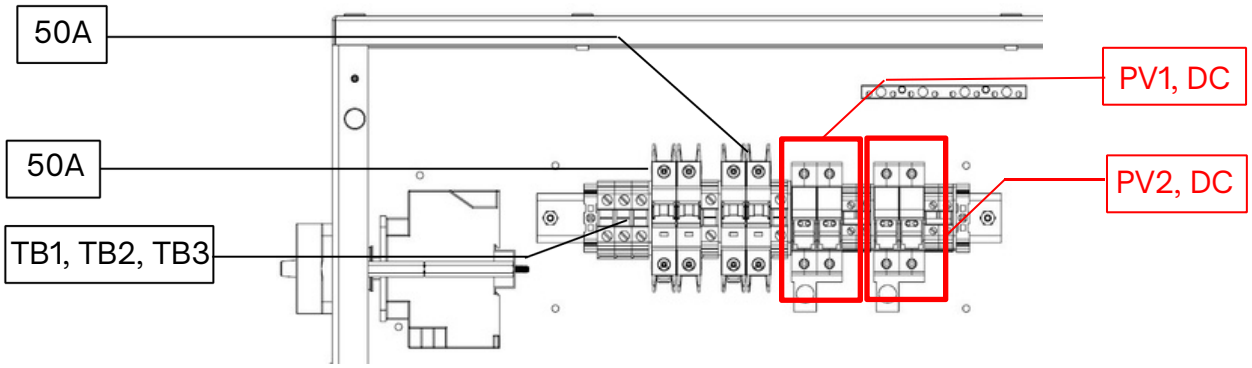


Figure 11

6.1.3 PV, VAC Connection or Generator Connection

Use copper wire only. The minimum wire size that can be used is 8AWG. The maximum wire size that will fit in the terminals is 6AWG. Connect the 120/240V wires from the VAC PV source to the top of CB2. Torque to 25 in-lb. (2,8Nm). Connect 120/240V neutral wire from the VAC PV source (if present) to the top of TB2. Torque to 25 in-lb. (2,8Nm). Refer to Figure 12 below for the location of CB2 and TB2 wiring locations. The max allowable ACC-Solar system that can be connected is 8360 Watt.

Note: An external generator can be installed at CB2 and TB2 if desired. When a generator source is installed, VAC PV source is not allowed.

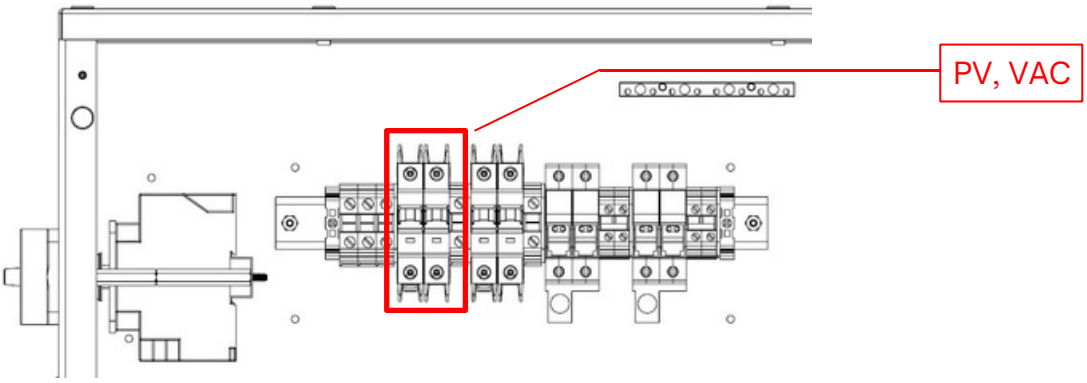


Figure 12

6.1.4 Output Connection

Use copper wire only. The minimum wire size that can be used is 8AWG. The maximum wire size that will fit in the terminals is 6AWG. Connect the output wires at the top of CB3. Torque to 25 in-lb. (2,8Nm). Connect the output neutral wire at the top of TB3. Torque to 25 in-lb. (2,8Nm). Refer to Figure 13 below for location of CB3 and TB3 wiring locations.

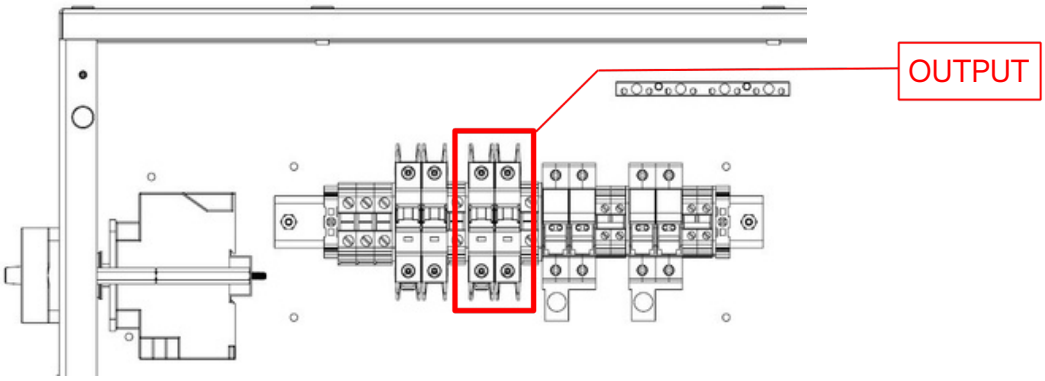


Figure 13

6.1.5 Optional Battery Connection

The battery cabinet, NV24, comes with 4AWG wire. Connect the wire to the output terminals on the battery cabinet. Torque to 32 in-lb. (3,7Nm). See figure 14.

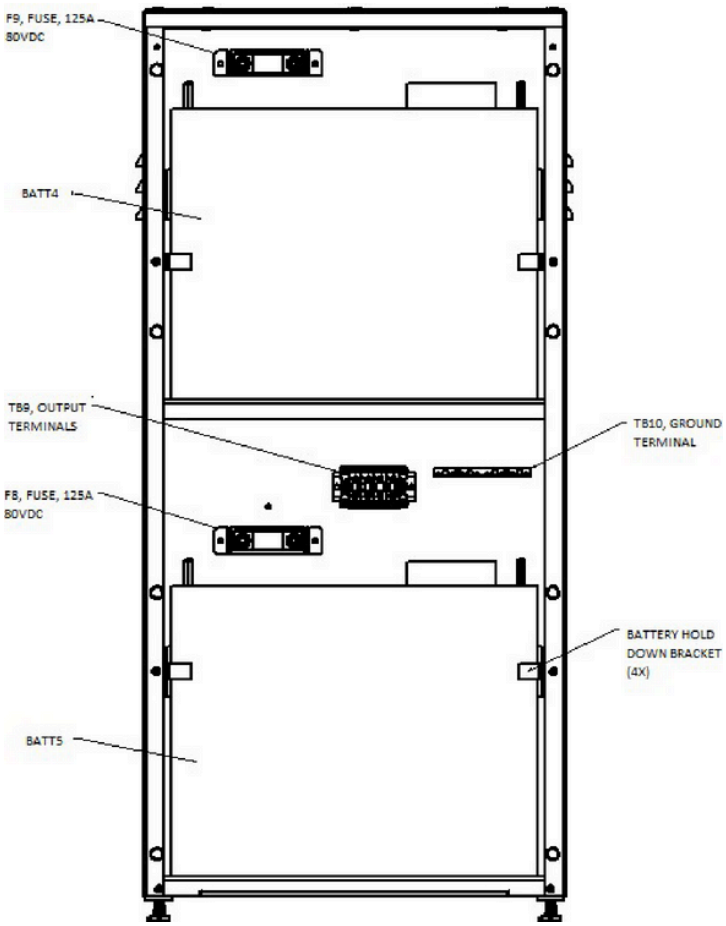


Figure 14

Route the wires to the left or right as required by the placement of the battery cabinet with respect to the NV14. The minimum wire size that can be used is 4AWG.

The length of wire provided is the longest allowed.

Connect the two (2) red (+) wires to the NV14 fuse bar as shown in figure 15. Tighten to 90 in-lbs.

Figure 15

Connect the two (2) black (-) wires to the negative terminals as shown in figure 16. Tighten to 18 ft-lbs.

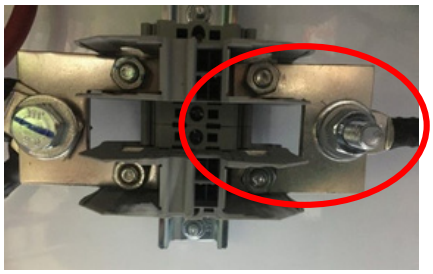


Figure 16

Note: it may be necessary to remove the din rail assembly of the negative terminals to tighten the battery wires to the terminals. If needed, remove the din rail from the back of the NV14 at the two (2) mounting screws.

Connect the ground wire to the NV14 ground terminal. Route the wire and secure using wire ties provided. Connect the CAT5 ethernet cable to the top battery in the NV14. Route the cable and secure using wire ties provided.

6.2 Battery Installation

There are three (3) batteries that come supplied with the NV14 Energy Storage System. They are supplied separately and need to be physically installed and wired. The batteries are shipped in 'sleep mode.'

Note: "Sleep Mode 1" means the BMS is turned off. Batteries in sleep mode do not have any live voltage on the terminals.

When a battery is in sleep mode, all indicators are unlit. If a battery 'wakes up' prior to installing, place it into sleep mode by pressing the reset button for 5 seconds. The battery reset button can be pressed using any thin, solid material (such as the end of a provided paperclip, see Figure 17).

Figure 17

WARNING:

BATTERIES ARE HEAVY. Each battery weighs approximately 96.5 lbs. (43.8kg). A two (2) person team for installation is strongly recommended to prevent personal injury.

The NV14 Energy Storage System is supplied with battery brackets to keep batteries securely in place after installation. The brackets will arrive installed; they must be removed prior to placing batteries and re- installed after the batteries are placed.

WARNING:

To protect against cabinet damage, do not operate the NV14 Energy Storage System without the battery brackets properly installed.

6.2.1 Battery 1 Installation Instructions

- Remove the upper battery hold down bracket (see figure 18)
- Lift the battery up onto battery shelf
- Push the battery flush against the back of the cabinet and slide the battery to the left until the battery is behind the the left side enclosure lip. Be careful not to 'pinch' the battery wires between the battery and cabinet. It is recommended to place the battery wires across the top of the battery with the terminals outside the cabinet.
- Replace the upper battery hold down bracket

Note: Do not connect the terminal wiring at this time. Note the wire terminal lug has a protective cover. Do not remove the protective cover until it is time to wire the batteries at a later step in the installation process.

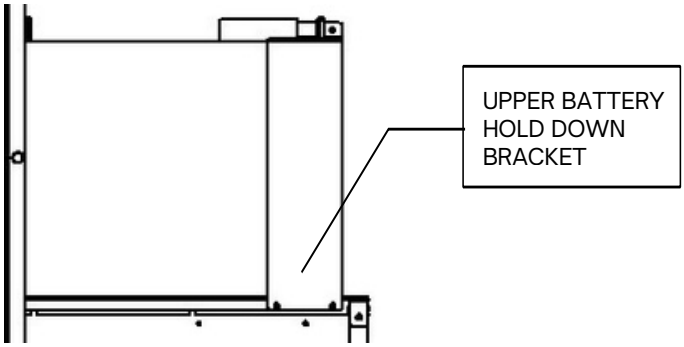


Figure 18

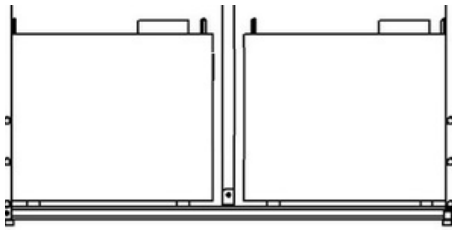


Figure 19

6.2.2 Batteries 2 and 3 Installation

- Lift each battery up onto the cabinet base
- Push the battery flush against the back of the cabinet and slide the battery to the respective side until the battery is behind side enclosure lip. Be careful not to 'pinch' the battery wires between the battery and the cabinet. It is recommended to place the battery wires across the top of the battery with the terminals outside the cabinet
- Do not replace the lower battery hold down bracket at this time. Set the brackets and hardware aside and install after battery wiring steps are completed.

Note: Do not connect the terminal wiring at this time. The wire terminal lug has a protective cover. Do not remove the protective cover until it is time to wire the batteries at the next step in the installation process.

6.2.3 Batteries 4 and 5 Installation (Optional Battery Cabinet)

- Lift each battery up into the cabinet with Battery 4 on the top shelf and Battery 5 on the bottom.
- Push the batteries flush against the back of the cabinet. Be careful not to ‘pinch’ the battery wires between the battery and the cabinet. It is recommended to place the battery wires across the top of the battery with the terminals outside the cabinet.
- Rotate the battery hold down brackets 90 degrees so that each bracket is against the face of the battery. Tighten the bracket in place (see figure 14). Both of the batteries in the NV24 have these brackets on both sides of the batteries.

6.3 Battery Wiring Connections

- Remove the battery terminal cover and set aside.
- Connect the black battery wire to each battery negative terminal using the terminal hardware provided with each battery. Each battery has two (2) terminals marked as ‘-’. Either terminal is acceptable to connect the black battery wire. Torque the battery terminal to 160 in-lbs. (18Nm).
- Connect the red battery wire to each battery positive terminal using the terminal hardware provided with each battery. Each battery has two (2) terminals marked as ‘+’. Either terminal is acceptable to connect the red battery wire. Torque the battery terminal to 160 in-lbs. (18Nm).
- Connect the CAT5 ethernet cable to the battery RS485 port. There are two (2) RS485 ports. The upper battery has one (1) CAT5 cable to install. Either RS485 port on the battery is acceptable. The lower batteries have two (2) CAT5 cables to install in each of the RS485 ports.
- Replace the battery terminal covers.

Note: To install wiring on the lower batteries, it is necessary to slide the batteries out of the cabinet approximately 3” (76mm) - enough to expose the battery terminals. Do not slide the battery all the way out of the cabinet as the battery wiring will not be long enough.

- Push the lower batteries back into the cabinet flush against the back of the cabinet and verify that the slid battery is behind the enclosure lip. Be careful not to ‘pinch’ the battery wires.
- Install the lower battery hold down bracket previously removed.
- If the Optional Battery Cabinet is installed, connect wiring to batteries 4 and 5 as noted above.
- If the Optional Battery Cabinet is installed, connect the CAT5 ethernet cable to the RS485 port on the battery as noted above.

7 Operation

7.1 Applying Power

Apply power in the following step-by-step procedure. Do not advance to the next step until the current step has been properly verified.

1. Verify that all internal circuit breakers (CB1, CB2, CB3) are in the OFF position.
2. Verify that the NV14 Energy Storage System disconnect switch is in the OFF position.
3. Verify that the NV14 Energy Storage System inverter disconnect switch is in the OFF position.
4. Verify the NV14 Energy Storage System inverter DC Bus switch is in the OFF position (depressed).
5. Turn on the tandem 40 A grid power breaker at the feeder breaker panel.
6. Turn on the NV14 Energy Storage System disconnect switch.
7. Wake up the upper battery (Batt1) by using a small rigid pin (such as the end of provided paper clip). This will wake up all connected batteries in the NV14 and/or NV24. If all batteries do not automatically turn on, then turn each one on manually.
8. Verify the proper voltage is present at the Utility Grid circuit breaker '+N' (top) within the cabinet.
9. Turn on the NV14 Energy Storage System inverter switch. Push in the "Green" ON button (press in).
10. Within approximately 5 seconds, the NV14 Energy Storage System LCD screen should turn on. The AC grid LED should be illuminated. It takes Three minutes for the "Normal" LED to come on.
11. Use a voltmeter to verify that the battery voltage is between 47 and 51 VDC (Nominal 48VDC).
12. Verify that the green charge lights are lit and the green run light is slowly flashing.
    a. The batteries are now live. Replace the battery terminal covers that were previously removed. It is important that battery terminal covers are in place to avoid accidental contact with the battery terminals.
13. Verify voltage is present at the bottom of the output circuit breaker.
14. Once the Normal LED light illuminates, flip up/on the output circuit breaker.
15. Confirm if AC and/or DC PV is installed.
    a If AC PV is installed, flip up/on the AC PV input breaker.
    b If DC PV is installed, push closed the DC PV fuse blocks.
16. The entire system is now live.
17. Verify that the inverter settings are correct (refer to Settings Section for guidance).

8 System Settings

All system settings are performed on the internal inverter at the LCD screen. The LCD screen is accessible by removing the front cover.

WARNING:
Only a NeoVolta authorized installer is allowed to configure or adjust the system settings. Contact NeoVolta for a list of authorized installers in your region.

All system settings are passcode protected. An authorized NeoVolta installer has the passcode and can adjust the system settings.

The following sections describe the available NV14 Energy Storage System settings, the functional behavior, and the factory default settings.

8.1 Operation and Display Panel

The Operation and Display Panel consist of four (4) indicators across the top, four (4) function keys at the bottom, and an LCD display that indicates the operating status and the input/output power information. See Figure 20.

Figure 20

Table 1, shown below, lists the indicator LED status. Table 2, shown below, lists the function key action.

Table 1

LED Indicator		Status
DC	Green LED Solid Light	DC PV Connection Normal
AC	Green LED Solid Light	AC Grid Connection Normal
Normal	Green LED Solid Light	Inverter Operating Normal
Alarm	Red LED Solid Light	Malfunction or Warning

Table 2

Function Key	Action
Esc	Exit setting mode Go to previous selection or increase
Up	value of selected box Go to next selection or decrease
Down	value of selected box Confirm selection or save screen
Enter	values before exiting

8.2 LCD Display Icons

8.2.1 MainScreen

The LCD Main Screen is a touchscreen display. The image below, Figure 21, shows the overall information of the NV14 Energy Storage System.

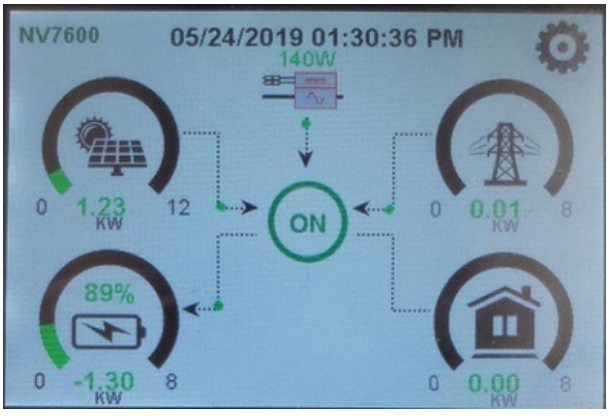


Figure 21

8.2.1.1 Features of the Main Screen

Indicates the system is operating normally. If it displays a red “X” the system has an error. An error code will display underneath the icon. Refer to the Appendix for error codes. If the icon is a green “up” arrow, the firmware is being upgraded.

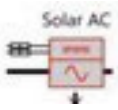
System Setup Icon. Press this to enter the system setup screen which includes Basic Setup, Battery Setup, Grid Setup, System Alarms and Li-Batt info. An alternate method to enter System Setup is to press the ‘Enter’ button.

PV Power, DC. The value is shown for illustration only. Arrows are always shown flowing away from the icon indicating that the DC PV Solar is providing power to the NV14 Energy Storage System. The power value shown is always positive.

Battery Power and Charge level. The values shown are for illustration only. When arrows are shown flowing away from the icon, it indicates batteries are providing power to the NV14 Energy Storage System and the power value is positive. When arrows shown flowing into icon, it indicates the batteries are being charged and the power value is negative.

Grid Power. The values shown are for illustration only. When arrows are shown flowing away from the icon, it indicates that the utility is providing power to the NV14 Energy Storage System and the power value is positive. When arrows are shown flowing into icon, it indicates the system is selling to the main service panel and/or grid. The Power value is negative.

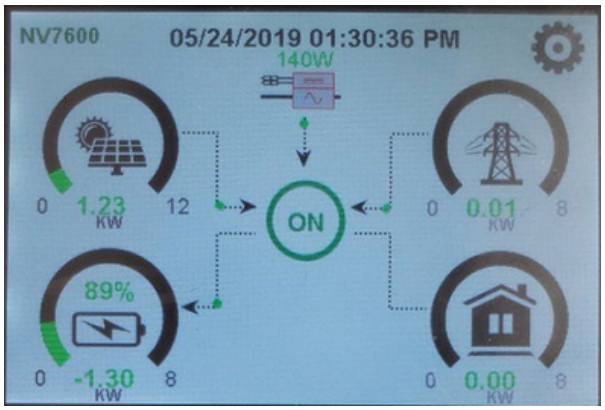
Load Power. The values shown are for illustration only. The arrows always are shown flowing into the icon indicating that the NV14 Energy Storage System is providing power to loads.



AC PV (String or Micro inverter). The values shown are for illustration only. Arrows are always shown flowing away from icon indicating that the AC PV Solar is providing power to the NV14 Energy Storage System. The power value shown is always positive. This icon may show 5-20 watts of current flow even when the sun is not out as this value reflects the NV14 safe grid signal.

8.2.2 System Setup Menu

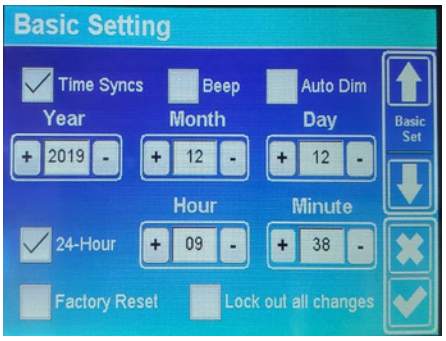
The system setup menu is accessed by pressing the System Setup icon on the Main Screen. The System Setup screen is shown to the right.



The System Setup screen displays the seven (7) sub screens. The seven (7) sub screens are Basic Setting, Battery Setting, System Work Mode, Grid Setting, Gen Port Use, Advanced Functions, and Device Info.

When making any changes on any screen, be sure to select the [OK] button, or the changes will not take effect. Changing screens either by selecting another tab or by selecting [Cancel] or the ESC key, will not save any changes.

8.2.2.1 Basic Setting

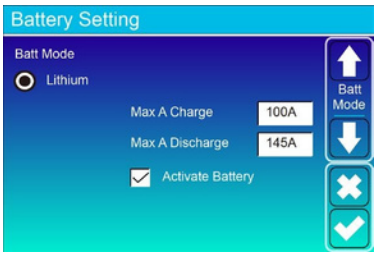


- **Beep:** Audible sound when system has a fault.
- **Auto Dim:** Will turn off the LCD screen after the number of seconds chosen (when box is checked).
- **24 Hour:** 24-hour display
- **Hour/Minute:** Time of Day
- **Factory Reset:** Resets all inverter settings to original factory settings
- **Lock Out:** Prevents any settings changes. Requires password.

FACTORY DEFAULT

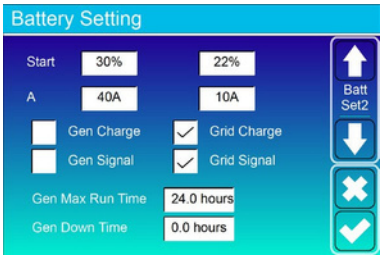
- **Beep:** Not selected.
- **Auto Dim:** Not selected
- **24 Hour:** Selected
- **Time of Day:** Set to Pacific Standard Time (does not allow for daylight savings)
- **Factory Reset:** Not selected
- **Lock Out:** Selected. Requires password to unselect to make settings changes.

8.2.2.2 Battery Setting



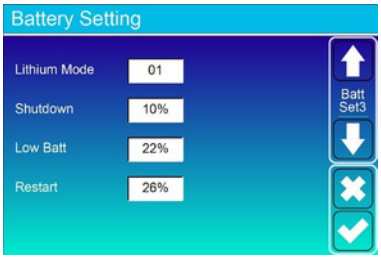
FACTORY DEFAULT:

- **Batt Mode:** Lithium
- **Max A Charge:** 100A
- **Max A Discharge:** 145A
- **Activate Battery:** Selected



FACTORY DEFAULT:

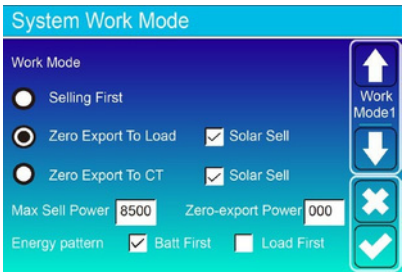
- **Start %:** 22%
- **A:** 10A
- **Grid Charge:** Selected
- **Grid Signal:** Selected
- **Gen Max Run Time:** 24-hours
- **Gen Down Time:** 0-hours



FACTORY DEFAULT:

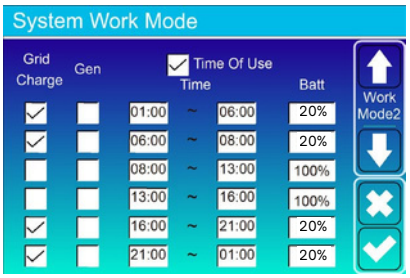
- **Lithium Mode:** 01 (do not change)
- **Shutdown:** 10% (Battery % inverter will shut down)
- **Low Batt:** 22%
- **Restart:** 26% (Battery % inverter will start charging, if possible)

8.2.2.3 System Work Mode



FACTORY DEFAULT:

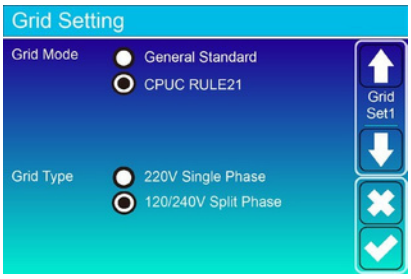
- **Selling First:** Unselected.
- **Zero Export to Load:** Selected
- **Solar Sell:** Checked
- **Zero Export To CT:** Not Selected
- **Solar Sell:** Checked
- **Max Sell Power(W):** 8500W
- **Energy Pattern Batt:** First Selected



FACTORY DEFAULT:

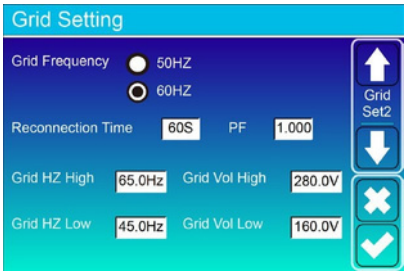
- **Time of Use:** Checked.
- **Time Chart:**
  - 20%: Level battery will stop discharging.
    Note: Utility rates are highest from 16:00 to 21:00 and batteries will be discharging during this time.
  - 100%: Level Solar will charge the battery to before providing power to the loads or sell to the grid.

8.2.2.4 Grid Setting



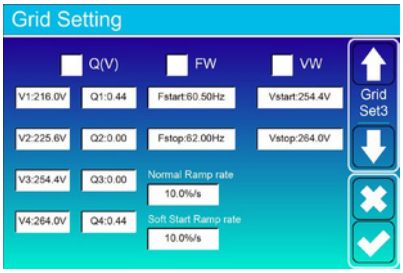
FACTORY DEFAULT:

- **Grid Mode:** CPUC RULE21 Selected.
- **Grid Type:** 120/240V Split Phase Selected



FACTORY DEFAULT:

- Grid Frequency: 60Hz
- Reconnection Time: 60s.
- PF: 1.000 Grid Hz High: 65.0Hz
- Grid Vol High: 280.0V
- Grid Hz Low: 45.0Hz Grid Vol Low: 1 6 0 .0V



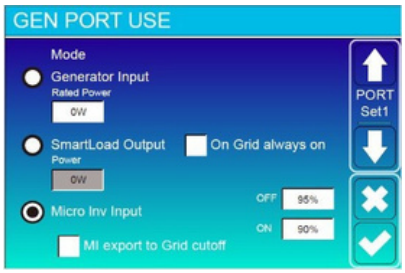
FACTORY DEFAULT:

- Q(V): Not Selected
- FW: Not Selected
- VW: Not Selected
- All other values to be as shown. Do not Change.

FACTORY DEFAULT:

- L/HVRT: Selected
- L/HFRT: Selected
- All other values to be as shown. Do not Change.

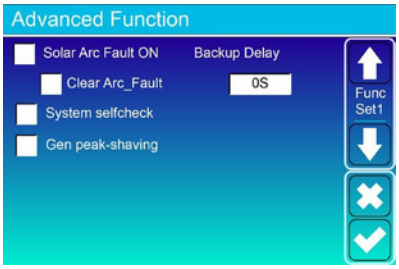
8.2.2.5 Gen Port Use



FACTORY DEFAULT:

- **Micro Inv Input:** Selected (unselect if no microinverters connected)
- **Gen Port use OFF:** 95%
- **Gen Port Use ON:** 90% (When Grid OFF, Battery level that Solar AC will start to charge batteries if excess Solar AC is available. Otherwise, Battery will power load)

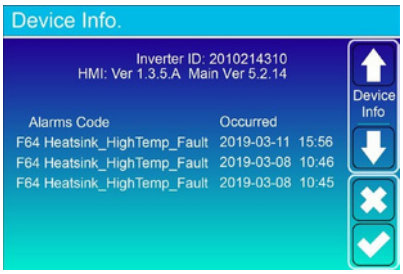
8.2.2.6 Advanced Functions



FACTORY DEFAULT:

- **Solar Arc Fault ON:** Not Selected
- **Clear Arc Fault:** Not Selected
- **System selfcheck:** Not Selected
- **Gen peak-shaving:** Not Selected

8.2.2.7 Device Info



DEVICE INFO:

- Shows history of faults
- Shows LCD firmware version 1.3.5.A
- Shows Inverter firmware version 5.2.1.4

9 Setup Wi-Fi Data Logger

Please refer to the Solarman App setup instructions; these can be located on our support page at www.neovolta.com

10 Installing Front Covers

1. Install the lower front cover (see Figure 22).
2. Install the upper front cover by securing the mounting screws first on the top location, then on the bottom location and then affix the middle screws last. Be sure to place screw caps on each mounting location (see Figure 22).
3. Once all covers and mounting screws have been secured, place the white screw caps on each front mounting location (10 places as shown in Figure 22).

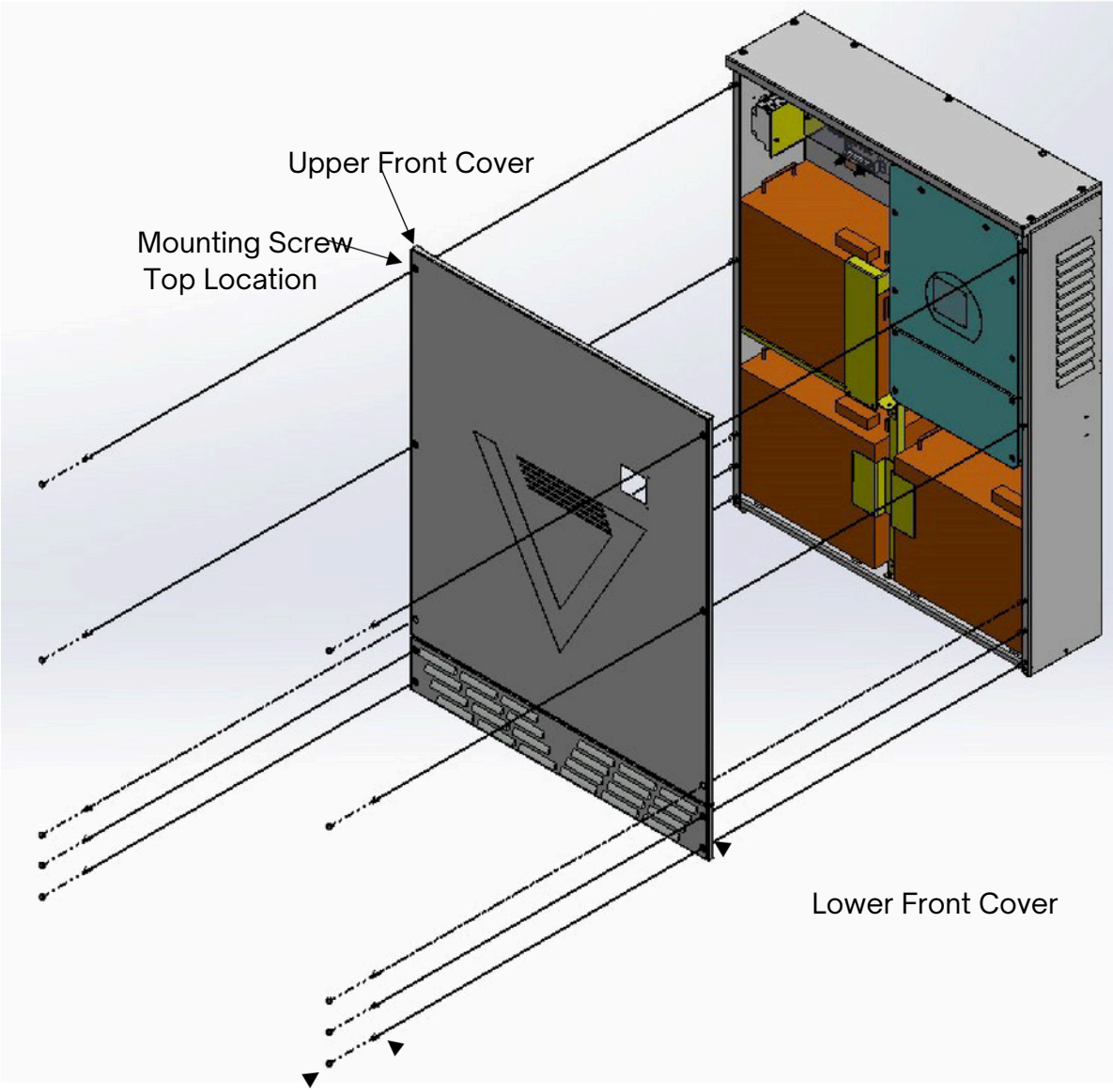

Upper Front Cover
Mounting Screw
Top Location
Lower Front Cover
Screw (10x)
Screw Cap (10x)

Figure 22

11 Specifications

SOURCE	SPECIFICATION	UNITS	VALUE
UTILITY	Voltage	VAC	120/240 Split phase
	Current	AAC	31.7A
	Frequency	Hz	57.0 – 62.0
	Circuit Protection	--	40A 2-pole circuit breaker
PV1, DC	Voltage	VDC	Range 125-425/ max 500Voc*
	Current	ADC	26A
	Frequency	W	5,700 per MPPT**
	Circuit Protection	--	25A Fuse (x2)
PV2, DC	Voltage	VDC	Range 125-425/ max 500Voc*
	Current	ADC	26A
	Frequency	W	5,700 per MPPT**
	Circuit Protection	--	25A Fuse (x2)
PV, AC (GENERATOR OPTIONAL)	Voltage	VAC	240
	Current	AAC	32A (9,200 W AC PV maximum)
	Frequency	Hz	45.0 – 65.0
	Circuit Protection	--	50A 2-pole circuit breaker
BATTERY PACK, CHARGING	Voltage	VDC	
	Current, max	ADC	100
	Capacity	Ah	300
	Type	--	Li-Fe-PO4
	Protection (+)	--	125A, 80VDC Fuse

SOURCE	SPECIFICATION	UNITS	VALUE
BATTERY PACK, DISCHARGE	Voltage	VDC	44-54, 48 nominal
	Current, max	ADC	150
	Capacity	Ah	300 (NV14) 500 (NV24)
	Type	--	Li-Fe-PO4
	Protection (+)	--	125A, 80VDC Fuse
OUTPUT	Voltage	VAC	120/240 Split phase
	Current	AAC	31.7A
	Frequency	Hz	45.0 – 65.0
	Circuit Protection	--	50A 2-pole circuit breaker
ENVIRONMENT	Enclosure Rating	--	NEMA 3R
	Dimensions (NV14)	in (mm)	50H x 38W x 10D (1270 x 965 x 25)
	Dimensions (NV24)	In (mm)	42H x 20W x 10D (1080 x 508 x 25)
	Temperature, Min	C (°F)	-20°C (-4°F)
	Temperature, Max	C (°F)	45°C (113°F)
	Weight	lbs (kg)	NV14 575 (260) / NV24 270 (122)
COMPLIANCE	NV14		CAN/UL-9540:2016
	Inverter, NV7600		UL1741 Third Edition SB, IEEE1547, FCC 15 Class B, UL1699B
	Battery		UL1741, IEEE1547-2018, FCC 15 CLASS B, UL1699B, UL 9540A

*500 Voc is not exceeded at coldest temperature

**Max total connected PV for PV1 & PV2

12 Technical Reference

	SPECIFICATION	UNITS	VALUE
TORQUE	Utility Input, CB1	In-lb	25
	Utility Input, TB1	In-lb	25
	PV, DC Input, F1-F4	In-lb	25
	PV, DC Input, TB4-TB5	In-lb	25
	PV, AC Input, CB2	In-lb	25
	PV, AC Input, TB2	In-lb	25
	Output, CB3	In-lb	25
	Output, TB3	In-lb	25
	Ground Bar, TB6	In-lb	25
WIRE SIZES	Utility Input	--	8 AWG Cu, 75C, 600V
	PV, DC	--	8 AWG Cu, 75C, 600V
	Input PV, AC	--	8 AWG Cu, 75C, 600V
	Input Output	--	8 AWG Cu, 75C, 600V
	Ground	--	8 AWG Cu, 75C, 600V
FUSES	PV, DC Input	--	20A, 600VDC, Littelfuse SPF or UL listed equivalent
	Battery	--	125A, 80VDC, Littelfuse CNN_E or UL listed equivalent

13 Contact Information

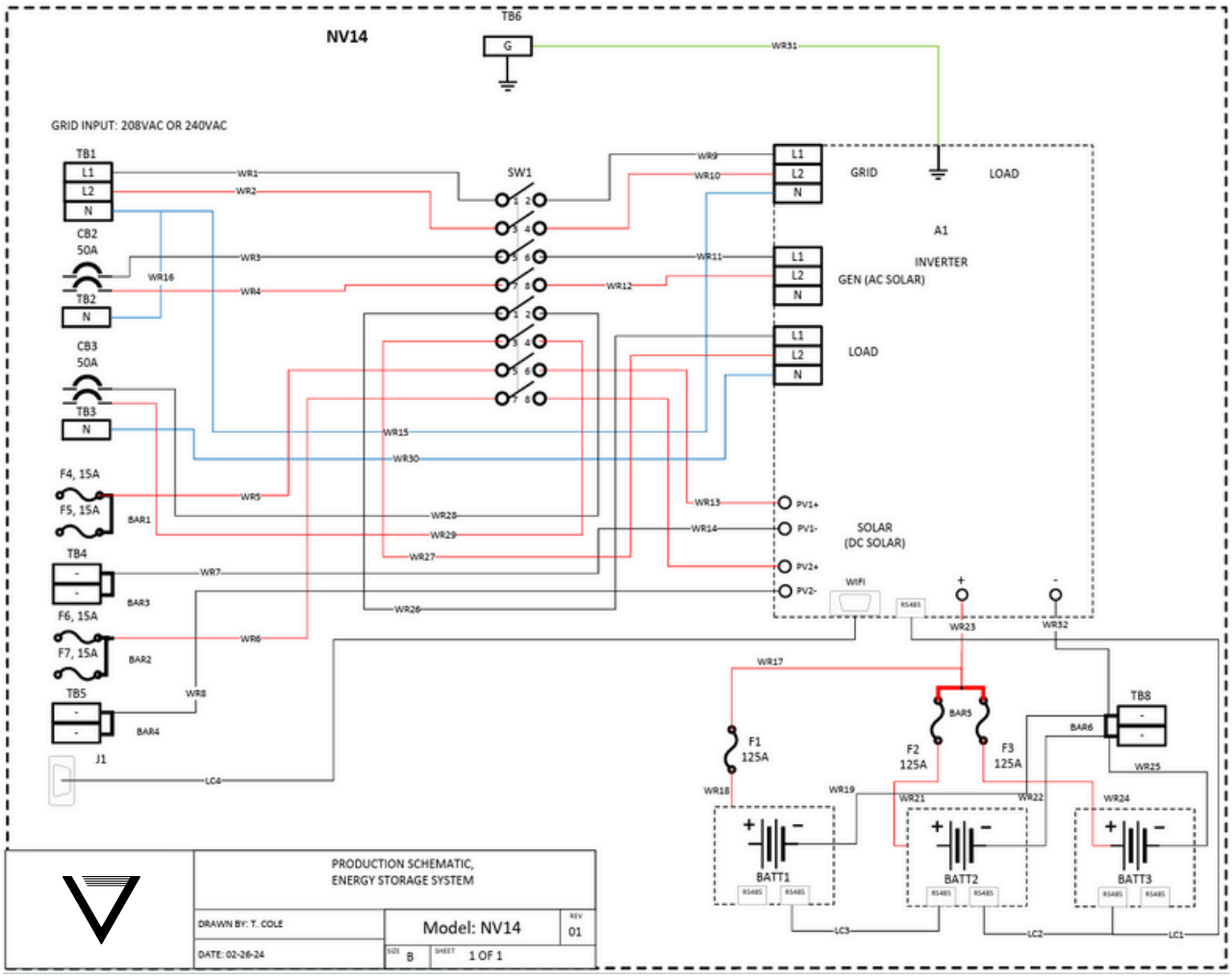
For all service installation questions, please contact NeoVolta Operations

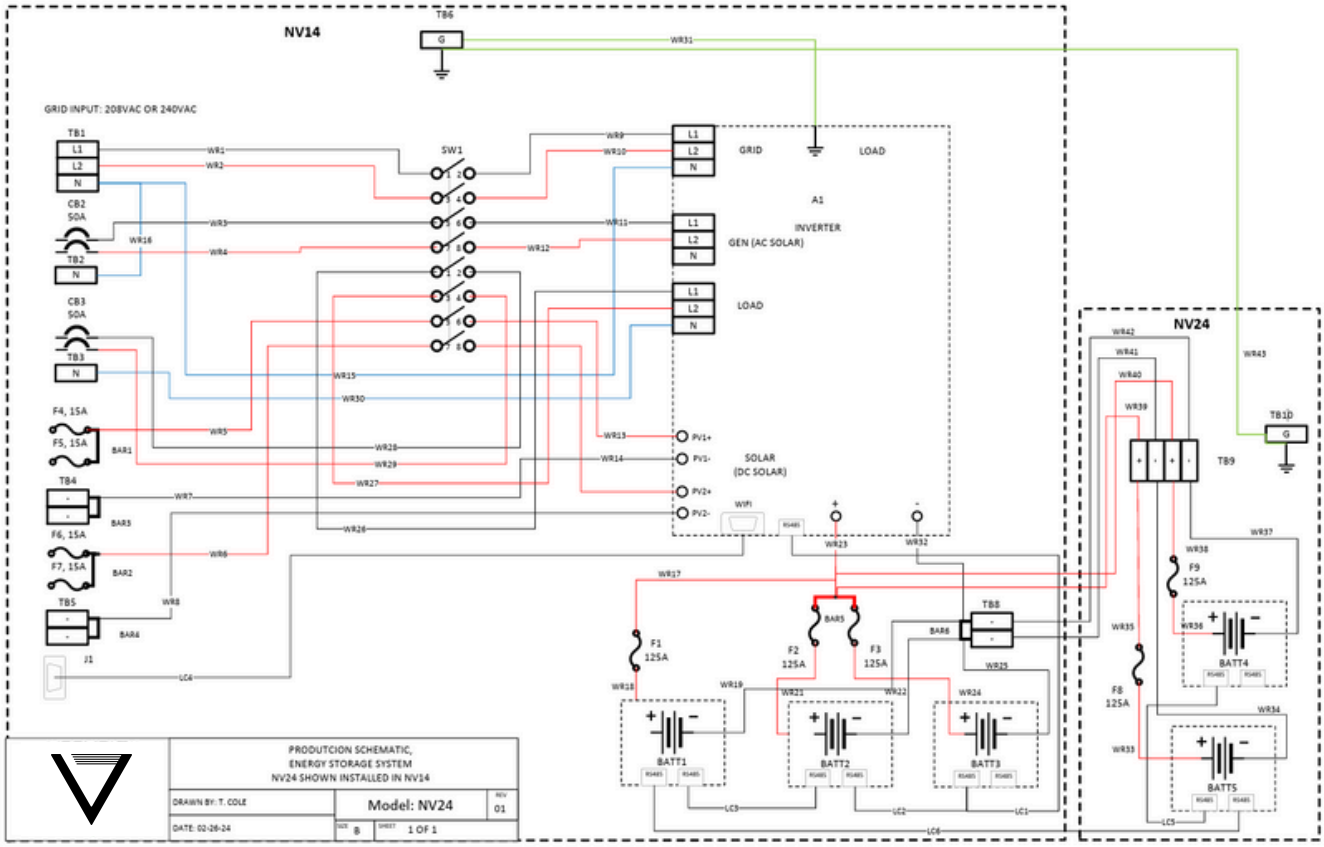
Phone: 800.364.5464

www.neovolta.com/support

14 Appendix

14.1 Schematic




NV14
NV24
GRID INPUT: 208VAC OR 240VAC
TB6
G
WR31
TB1
L1
L2
N
CB2
50A
CB3
50A
TB2
TB3
SW1
WR1
WR2
WR3
WR4
WR5
WR6
WR7
WR8
WR9
WR10
WR11
WR12
WR13
WR14
WR15
WR16
WR17
WR18
WR19
WR20
WR21
WR22
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WR27
WR28
WR29
WR30
WR32
WR33
WR34
WR35
WR36
WR37
WR38
WR39
WR40
WR41
WR42
WR43
GRID
LOAD
A1
INVERTER
GEN (AC SOLAR)
LOAD
PV1+
PV1-
PV2+
PV2-
SOLAR
(DC SOLAR)
WIFI
F4, 15A
F5, 15A
F6, 15A
F7, 15A
BAR1
BAR2
BAR3
BAR4
BAR5
BAR6
TB4
TB5
J1
LC4
F1
125A
F2
125A
F3
125A
TB8
BATT1
BATT2
BATT3
LC3
LC2
LC1
LC6
TB10
TB9
F9
125A
F8
125A
BATT4
BATT5
LC5
PRODUTCION SCHEMATIC,
ENERGY STORAGE SYSTEM
NV24 SHOWN INSTALLED IN NV14
DRAWN BY: T. COLE
Model: NV24
REV
01
DATE: 02-26-24
SIZE
B
SHEET
1 OF 1

14.2 Fault Messages

Fault Code	Failure Mode	Fault Code	Failure Mode
F01	DC_Inversed_Failure	F33	AC_OverCurr_Fault
F02	DC_Insulation_Failure	F34	AC_Overload_Fault
F03	GFDI_Failure	F35	AC_NoUtility_Fault
F04	GFDI_Ground_Failure	F36	AC_GridPhaseSeque_Fault
F05	EEPROM_Read_Failure	F37	AC_Volt_Unbalance_Fault
F06	EEPROM_Write_Failure	F38	AC_Curr_Unbalance_Fault
F07	GFDI_Fuse_Failure	F39	INT_AC_OverCurr_Fault
F08	GFDI_Relay_Failure	F40	INT_DC_OverCurr_Fault
F09	IGBT_Failure	F41	AC_WU_OverVolt_Fault
F10	AuxPowerBoard_Failure	F42	AC_WU_UnderVolt_Fault
F11	AC_MainContactor_Failure	F43	AC_VW_OverVolt_Fault
F12	AC_SlaveContactor_Failure	F44	AC_VW_UnderVolt_Fault
F13	Working_Mode_change	F45	AC_UV_OverVolt_Fault
F14	DC_OverCurr_Failure	F46	AC_UV_UnderVolt_Fault
F15	AC_OverCurr_Failure	F47	AC_OverFreq_Fault
F16	GFCI_Failure	F48	AC_UnderFreq_Fault
F17	Tz_COM_OC_Fault	F49	AC_U_GridCurr_DcHigh_Fault
F18	Tz_Ac_OverCurr_Fault	F50	AC_V_GridCurr_DcHigh_Fault