

RaVolt Installation Guidelines

Generation 2

Version 2.3 Dated 08/01/2023



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All information contained within this document shall be used as a guide and not intended as complete instructions.
All installation activities shall be carried out by a qualified and properly trained electrician and all personnel must wear appropriate PPE.
All installation means and methods shall be per Scope of Work (SOW), stamped Design Documents, and <u>manufacturer installation guides</u>.



For further support please contact the RaVolt team.
Service Line: 1 (844) RAVSERV / 1 (844) 728-7378
Email: service@ravolt.com

1. Recommended Tools & Materials

The following list of tools and materials are recommended, but not required. Installations may require additional materials based on design.

Tools:

1. Hand Tools
 - a. Phillips head screwdriver
 - b. Flat head screwdriver
 - c. Small precision screwdriver
 - d. 5/16" nut driver
 - e. Wire strippers
 - f. Cable cutters
 - g. Linesman pliers
 - h. Crimpers
 - i. Shovel
 - j. Tamper
 - k. Level
 - l. Hammer
 - m. 6-foot ladder
 - n. Meter
 - o. Ground rod attachment
2. Power Tools
 - a. Knockout set or hole-saw set
 - b. Cordless hammer drill
 - c. Bandsaw or Sawzall
 - d. Impact gun
3. Rigging
 - a. 6' rigging straps
 - b. Shackle
 - c. Refer to *Ravolt Lifting Diagram*
 - d. Anchoring
 - e. Refer to *RaVolt Anchoring Diagram*

Materials:

1. Conduit
 - a. PV Input to DC Disconnects (1 list per string)
 - b. (1) 1" Weatherhead
 - c. (1) 1" sch. 40 cut to length (roughly 12-18")
 - d. (1) 1" TA/MA
 - e. (1) 1" bushing
 - f. (1) 1" locknut
2. Generator Circuit
 - a. (1) 2" non-metallic flexible conduit cut to length (roughly 6')
 - b. (1) 2" sch. 40 cut to length (roughly 4')

- c. (1) 2" sch. 40 to be placed in trench
 - d. (2) 2" 90° sch. 40 fittings
 - e. (2) 2" flexible straight fittings
 - f. (2) 2" flexible 90° fittings
 - g. (2) 2" locknuts
 - h. (2) 2" bushings
3. AC Output Circuit
- a. (1) 2" MA/TA
 - b. (1) 2" expansion joint
 - c. (1) 2" locknut
 - d. (1) 2" bushing
 - e. (1) 2" 90° sch. 40 fitting
 - f. 2" sch. 40 to be placed in the trench to AC disconnect according to design
4. Miscellaneous Materials
- a. Unistrut hardware
 - b. Unistrut straps
 - c. Colored electrical tape
 - d. All weather code-compliant conduit glue

2. Installation Overview

The RaVolt installation follows a standard process consisting of the following steps:

1. Unloading Equipment-Trucks will arrive with a palletted enclosure, a palletted generator, concrete pads, and batteries. It is recommended to level and set pads first, and then set the enclosure and generators directly off the truck.
2. Placing the Enclosure & Generator Pads-Choosing a desired location for both pads, typically on the northern side of the array, about 6 feet apart (Minimum gap for generator exhaust is 4'6"). This step also consists of leveling and compacting the designated pad locations.
3. Placing the Enclosure & Generator- Using slings and shackles on a capable machine (skid steer, mini excavator, or tractor), rig and place the equipment on their dedicated concrete pads.
4. Trenching & Conduit- There will be 2 main trenches, the AC Out trench and the generator circuit. The AC Out trench will be from the load center on the side of the unit to the AC disconnect on the side of the home. The generator circuit will be from the generator to the enclosure.
5. Terminations- The RaVolt unit arrives with pre-installed and pre-configured equipment. There are roughly 10 additional terminations to make on a standard project.
6. QA/QC, Commissioning, Photos- Installers will inspect the work using the QA/QC guidelines. There is a short commissioning process to ensure process functionality, followed by some photos for product warranties.

These 6 steps are broken down in greater detail throughout this installation guide.

3. Unloading Equipment

Recommended Tools & Materials: Weight-rated slings, weight-rated shackles, and weight-rated ratchet straps.

- Determine a safe, flat location for the truck to park for unloading.
- The delivery truck will arrive with the RaVolt enclosure banded to a pallet.
- Additional batteries will be in crates.

Operators must ensure sufficient lifting capacity of the machine to be used.

Estimated equipment weights are below:

- Estimated weight without batteries- 600 lbs
- Estimated weight with batteries - 1100 lbs
- Single Cabinet Weight – approx. 1100 lbs
- Paralleled Cabinet Weight – approx. 2300 lbs



Figure 1 - Cabinet installation using excavator

- If using a mini excavator for unloading the equipment, utilize properly weight-rated slings and properly weight-rated shackles. The unit will arrive with 4 lifting points present on the top of the enclosure. The operator must use **extreme caution** to not bend or break these lifting points, which may interfere with the enclosure's NEMA 3R rating. Straps with too severe of an angle will lead to bends on the lifting points. Ensure lifting force is as vertical as possible at all times. If using a forklift or skid steer for unloading the equipment, utilize properly rated 4-foot forks for lifting pallets.
- If using a forklift or skid steer for unloading the equipment, utilize a ratchet strap to secure the equipment to the mast of the unloading machine when transporting.
- Place equipment in a flat, secure, and safe location until the installation team is ready to progress.

4. Placement of Enclosure Pad

RaVolt Enclosure Pad Dimensions:

Single Enclosure 4' L x 3' W

Dual Enclosure 4' L x 6' W

Recommended Tools & Materials: Shovel, rake, hand tamper, crushed gravel, 4-foot level.

When choosing the location for the RaVolt enclosure, consider the following steps to ensure a successful installation:

1. **Review Project Design Documents:** Before determining the precise location, refer to the project-specific design documents. These documents will give you a general idea of where the enclosure should be placed.
2. **Ideal Location Criteria:** Look for a flat area that offers protection from erosion and other weather elements. This will safeguard the RaVolt unit and ensure its longevity and efficiency.
3. **Preparing the Pad:** Once you've identified the ideal location, prepare the concrete pad by leveling and compacting the area. To create a sturdy base, we recommend using gravel or crushed stone for compaction. (Check the provided photos for reference.)
4. **Using Precast Pad:** If a precast pad is provided, use a two-man lift to carefully place it on the level and compacted location. Make sure it is securely positioned for the enclosure installation.
5. **Pouring the Pad:** If you need to pour the pad, refer to the provided diagram for guidance. Follow the diagram's specifications to create a suitable foundation for the RaVolt enclosure.



Figure 2 - Locating and placement of RaVolt enclosure pad

Notes:

When installing RaVolt units, it's important to consider the following guidelines to ensure optimal performance and compliance with local and national codes:

1. **Orientation Flexibility:** RaVolt pads can be placed in any orientation preferred by the homeowner. For ground mount applications, units are typically installed on the north side of the solar array. For rooftop applications, placement near the meter is common.
2. **Code Compliance:** As the installer, you must ensure that the enclosure placement adheres to all relevant local and national codes. Consider factors such as gas line setbacks, utility easements, and other applicable regulations.
3. **Serviceable Radius:** Make sure that there is a 3-foot serviceable radius in front of and on the sides of the RaVolt enclosure. This ensures adequate access for maintenance and servicing tasks.
4. **Generator Considerations:** If a generator will be present near the RaVolt enclosure, ensure a distance of 4 feet 6 inches between the enclosure and the generator exhaust. On the non-exhaust side of the generator, a 4-foot gap is acceptable.

5. Placement and lifting of Enclosure



Figure 3 - Gen 1 Unit Installation

Recommended Tools & Materials: Slings, shackles, straps, snips

Once the designated pad has been positioned, the installation technician will proceed to rig and elevate the enclosure for its final placement. To ensure a smooth process, it is advised to use the pallet to transport the unit to the designated spot before removing the lifting bands.

For lifting instructions, please consult the provided lifting diagram.

In the case of a Single Cabinet Installation, use all four lifting eyes on the RaVolt unit, along with the suitable rigging equipment, to safely lift the RaVolt enclosure from the shipping pallet and position it onto the prepared pad.

For a Paralleled Cabinet Installation, Strapping must run through all 8 lifting eyes, 4 in front and 4 in back.

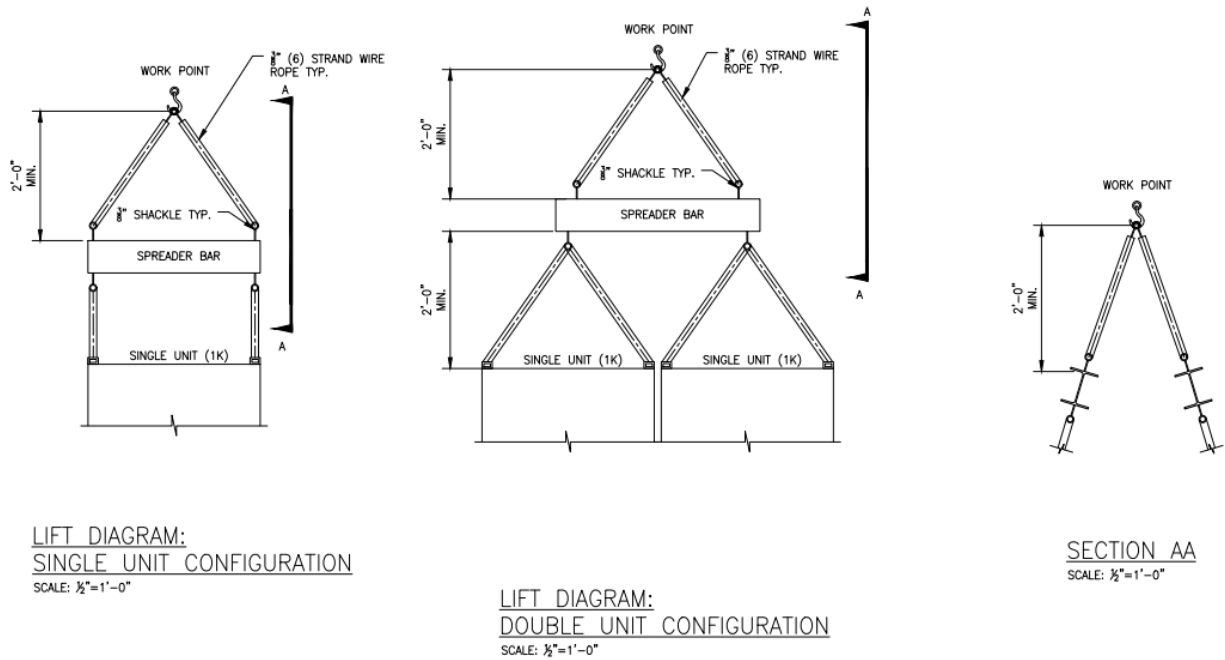


Figure 4 - Anchoring Points

To secure the unit effectively, utilize the provided anchoring hardware to fasten it securely to the pad.

After setting up the enclosure, proceed to install the supplied drip edge to maintain the NEMA 3R rating. The drip edge should be placed in the three holes located on the top of the enclosure, both on the front and back sides.

For this task, you will find T30 bolts already installed on the enclosure. Simply remove these bolts, align the drip edge holes with those on the enclosure, and then replace the bolts to complete the installation.

6. Trenching & Conduit

It is a requirement to contact the diggers hotline prior to any excavations and confirm the location of any unmarked utility or privately owned utilities.

1. Before excavations, contact the diggers hotline to confirm the location of any unmarked utility or privately-owned utilities.
2. Use a trencher or mini excavator to create three main trenches in the following locations: a) From the RaVolt Enclosure to the Generator or Service Disconnect for the Generator/Grid Input. b) From the RaVolt Enclosure to the AC Disconnect at the home for the AC Output. c) From the RaVolt Enclosure to the Solar Array (if necessary) for the PV Input.
3. Within each trench, install 2" sch. 40 conduit. Use a 90° fitting to extend the conduit upwards at the specified locations before backfilling. Make sure to use all-weather code-compliant conduit glue for making connections.
4. The RaVolt Enclosure will typically receive the following fittings in these locations:
 - a. a) Generator/Grid Input: Conduit stub -> Female adapter -> Straight flex fitting -> Flexible conduit -> 90° flex fitting -> Bushing & locknut into the disconnect on RaVolt Enclosure.
 - b. b) AC Output: Conduit stub -> Female adapter -> Straight flex fitting -> Flexible conduit -> Straight flex fitting -> Bushing & locknut into the load center on RaVolt Enclosure.
 - c. c) PV Input (Underground): Conduit stub -> Coupler -> Sch. 40 conduit cut to length -> LB fitting -> Sch. 40 conduit cut to length -> Male adapter -> Bushing & locknut into the DC disconnects on the RaVolt Enclosure.
 - d. d) PV Input (Weatherhead): 1" Weatherhead -> 1" Conduit cut to length -> 1" Male adapter -> Bushing & locknut into the DC Disconnect.



Figure 5 - Trench Example

Notes:

1. You have the ability to use either flexible conduit or sch. 40 for all incoming conduit connections; the material lists may differ slightly based on your choice.
2. Trenches should be dug to a depth of 18"-24", as per code requirements.
3. Before backfilling, ensure that warning tape is placed above the conduit or direct burial cable for added safety.
4. When backfilling trenches, use clean fill that is free of large rocks or sharp objects.
5. Conduit must be secured according to the NEC (National Electrical Code) guidelines to maintain proper installation standards.

7. Terminations

1. Install ground rod(s) at the enclosure. Properly ground and bond according to NEC code at the disconnect.
2. Once all trenching and conduit work is finished, pull wire to all specified locations as per the design. Make sure the wire sizing adheres to NEC code guidelines based on the system sizing.
3. **IMPORTANT:** Ensure that the power output from the RaVolt enclosure to the load is protected either at the home service entrance or before connecting to any load using a circuit breaker with a maximum rating of 200AMPS. Failure to comply with this safety measure could result in serious consequences such as fire, damage, injury, or even death.

Generator/Grid Input

1. Before proceeding, ensure there is no power on the grid/generator cables using a voltmeter.
2. Remove the screws and front plate from the disconnect.
3. All external AC power sources, whether from the grid, a generator, or a combination of both, will be terminated within the disconnect located on the side of the RaVolt enclosure.
4. After pulling the cable from the service disconnect or the generator to the RaVolt enclosure's side disconnect, begin making terminations according to NEC code guidelines. Refer to the one-line document for detailed termination directions.
5. Label the incoming cable and ensure the two hot legs are correctly terminated in the designated lugs. Make sure to torque the lugs to the manufacturer's specifications.
6. **NOTE:** If you are installing a paralleled inverter RaVolt system, a set of Polaris lugs will be pre-installed on the GRID input of the Sol-Ark inverters. Your incoming utility (or generator) line will land on the Polaris lugs to enable a parallel input into the Sol-Ark units.
7. Properly terminate both the neutral and ground in their designated locations and torque them to the manufacturer's specifications.
8. If both a grid and generator input are present, connect the grid input to the line side of the disconnect. The generator input should be terminated on the "GEN" breaker on the Sol-Ark.
9. The RaVolt enclosure comes pre-wired and pre-configured to allow the load side of this disconnect to flow through the inverter, into the load center, and into the home. Once you've landed the grid and/or generator inputs, this disconnect is complete.

AC Output

1. Before proceeding, ensure there is no power to the load center using a voltmeter.
2. Remove the screws and front plate from the load center.
3. After pulling the cable from the load center on the RaVolt enclosure to the AC disconnect on the side of the home or dwelling, proceed to make terminations in the appropriate locations within the load center, utilizing the 200A feed-thru lugs.
4. Label the cables and terminate them on the load side of the 200A breaker, following the manufacturer's specifications and adhering to NEC code guidelines.
5. Ensure both the neutral and ground are correctly terminated in their designated locations within the load center.
6. The RaVolt enclosure arrives pre-wired and pre-configured to connect the load center to the inverter. Once you have terminated this AC out cable, the load center is complete and ready to function.

PV Input

1. Ensure that there is no power on the incoming PV cable. **DO NOT MAKE MC4 HOME RUN CONNECTIONS UNTIL AFTER TERMINATING THIS DC DISCONNECT.**
2. Label the cables correctly, clearly indicating different strings, positive, and negative.
3. Run the PV cables from the array into a drip loop and then into the weather head, which will lead directly into the DC disconnect on the side of the enclosure.
4. Place the switch in the "off" position, and then remove the screws from the DC disconnect cover to access the interior.
5. Proceed to make terminations within the DC disconnect following the manufacturer's specifications. For detailed termination instructions, refer to the one-line document.
6. After making and verifying the terminations, replace the screws and DC disconnect cover.
7. The RaVolt enclosure comes pre-wired and pre-configured to connect the DC disconnects to the MPPT's on the Sol-Ark inverter. Once the incoming wires are properly terminated, these disconnects are complete.

Two Wire Start

1. Typically, a two-wire start circuit is required for the generator, consisting of 2 #10 AWG THHN/THWN wires.
2. Run these two wires from the generator, through the disconnect, and into the RaVolt enclosure.
3. Before proceeding, ensure there is no power to the Sol-Ark inverter.
4. Terminate these wires on the Sol-Ark inverter using pin terminals at terminal blocks 7 + 8. For more detailed instructions, refer to the Sol-Ark manual if necessary.
5. For the generator side of the two-wire start circuit, terminate it at the designated two-wire start terminals. Refer to the generator's manufacturer manual and specifications for specific instructions.

Trickle Charge Circuit

1. If a generator is present, it will likely need a trickle charge circuit to continuously charge the battery of the generator. This circuit will typically consist of 3 #10 AWG THHN/THWN wires.
2. Run these wires from the generator, through the disconnect, and into the RaVolt enclosure.
3. Ensure there is no power to the terminal blocks within the RaVolt enclosure.
4. Label these wires and terminate at the terminal blocks at the top right corner of the RaVolt enclosure. The hot wire will be terminated at block 1, neutral at block 2, ground at block 3. Terminate the generator side of the trickle charge circuit at the designated 120 VAC input location. Refer to the generator's manufacturer manual and specifications for specific instructions.

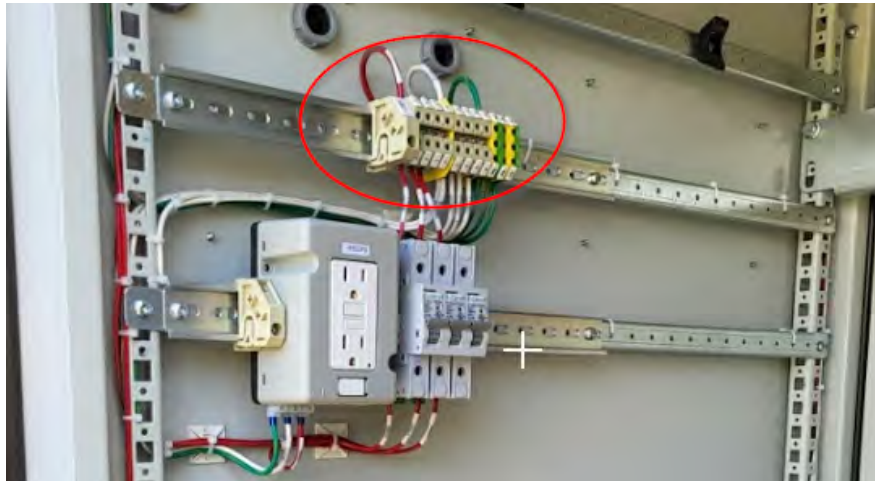


Figure 6 - Terminal Block Location

Dual Cabinet Terminations

NOTE: If (2) Paralleled cabinets are on site you will have received the cabinet and a second pallet with additional batteries. Only the bottom battery in each cabinet has been installed.

1. Install the remaining batteries in the racks that were provided.
2. Connect the double-lugged positive terminal to the top-left terminal of each battery bank.
3. Use the provided interconnecting wires to connect the two battery banks together. Connect the positive terminals to each other and the negative terminals to each other.
4. Use the provided Bus bars to connect all the battery terminals together.
5. Install the battery terminal touch-safe covers as provided.
6. Connect an Ethernet cable from the Master inverter to the CANbus port of the Host Battery.

7. Connect a custom Ethernet cable from the host battery to submodule 1 (the cable should be labeled "host to sub").
8. Connect the remaining batteries using the standard Ethernet cables provided.
9. Once completed, the final setup should resemble the pictures provided as a reference.



Figure 7 - Left side is the Master Cabinet, Right side is the slave cabinet.

10. Set dial switches per the below table:

6-BIT TOGGLE SWITCH SETTINGS

HOST MODULE TOGGLE SWITCH SETTINGS

	#1	#2	#3	#4	#5	#6	Inverter
Host Option 1	OFF	OFF	OFF	OFF	OFF	ON	Sol-Ark, Pylon, Goodwe
Host Option 2	OFF	OFF	OFF	OFF	ON	ON	Victron, SMA

SUB-MODULE TOGGLE SWITCH SETTINGS (1-29 MODULES)

Module	#1	#2	#3	#4	#5	#6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF

Figure 8 - (PowerSync DIP Switch Settings)

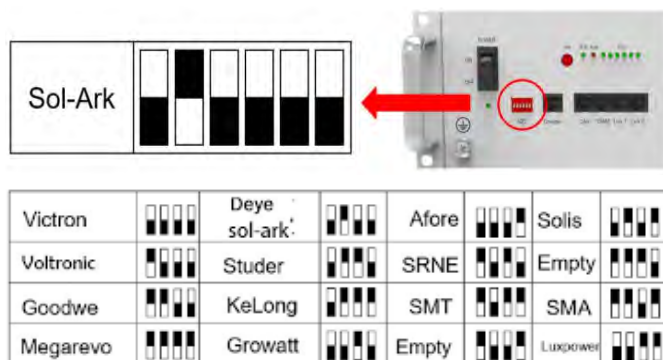


Figure 9 - (Pytes Dip Switch Settings)

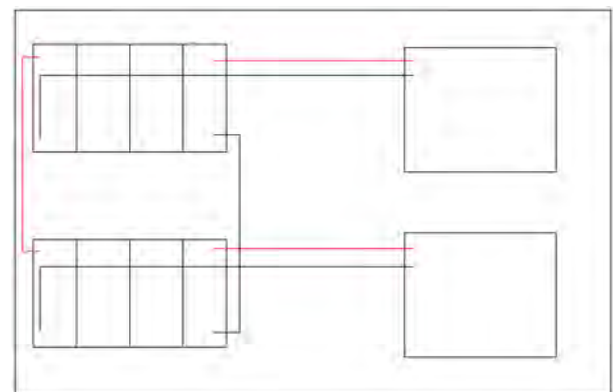


Figure 10 - MultiStack Wiring Detail

8. Enclosure Labeling

When you receive the RaVolt enclosure, it will come with a packet of labels that are essential for the proper functioning of the system. Your task is to ensure that these labels are present and in good condition.

Once you have the labels, carefully place each label at its appropriate location on the RaVolt enclosure. To help you with this, refer to the photo below, which provides references for the correct placement of the labels.

This is the minimal labeling required, please confirm with AHJ and local utility that all labeling requirements have been met. Please see the last page of the guidelines for additional labeling that may be required.

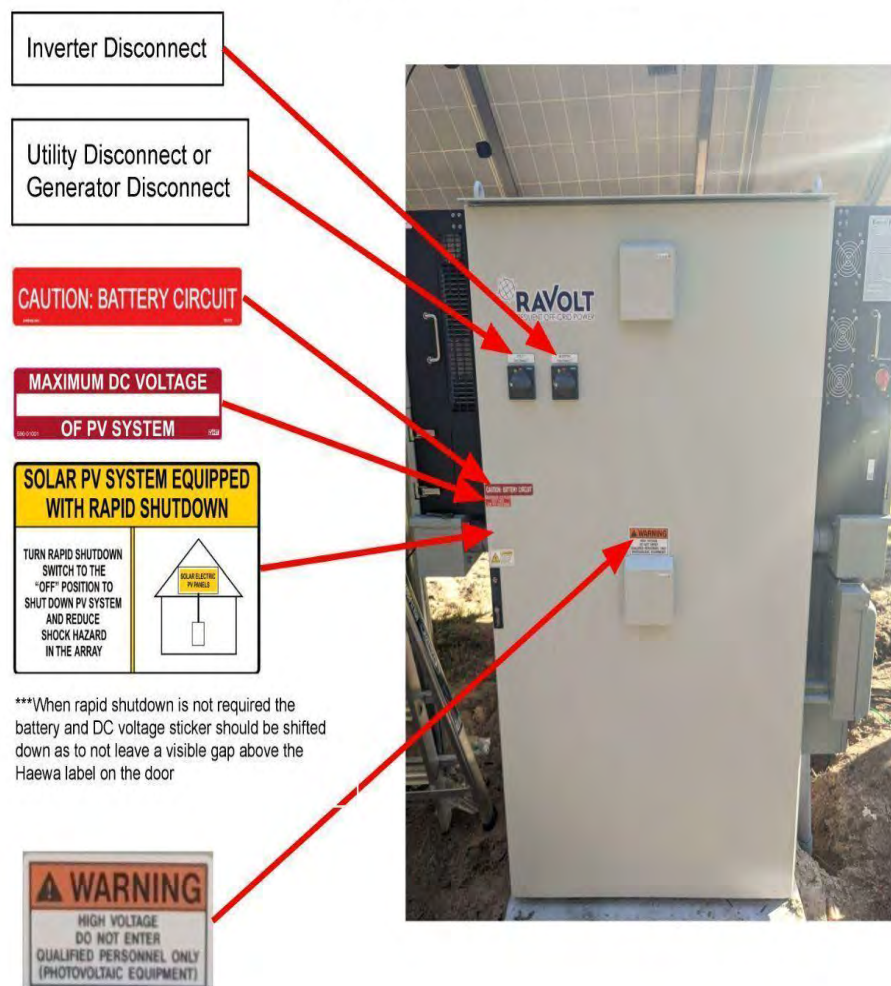


Figure 11 - Ravolt Unit Labels

RaVolt Unit Labeling (Field Crew)

AC Disconnect Labeling



DC Conduit Labeling



**⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM**

***Utility must always be consulted to confirm if there are any Utility Specific labeling requirements. These additional labels are generally placed on the meter unless otherwise specified

Meter Labeling (ONLY REQUIRED ON GRID TIED SYSTEMS)



**PHOTOVOLTAIC
DC DISCONNECT**

DC Disconnect Labeling (Rooftop Jobs Only)



SOLAR PV DC CIRCUIT

*** When multiple inverters are installed this sticker is required on every DC Conduit entering the inverters

Figure 12 - Field Crew Label Identification

9. QA/QC Walkthrough

1. Commence Inspection: Thoroughly inspect all aspects of the completed work using the "RaVolt QA/QC Inspection Sheet." This sheet highlights all critical components that require inspection.
2. Inspection Coverage: The inspection must encompass all important elements, including conduit installation, trenching, terminations, labeling, and any other relevant aspects. Pay close attention to the accuracy and completeness of each component.
3. Complete Inspection Sheet: Ensure that the "RaVolt QA/QC Inspection Sheet" is thoroughly filled out during the inspection. Every relevant detail should be documented on the sheet.
4. Signature for Warranty Registration: A representative of the installation team must sign off on the completed "RaVolt QA/QC Inspection Sheet." This signature is necessary for warranty registration and ensures that the inspection has been diligently conducted.
5. Addressing Issues: If any issues or discrepancies are identified during the inspection, they must be corrected promptly. Document all corrections made on the "RaVolt QA/QC Inspection Sheet" to maintain a comprehensive record of the improvements.

10. Commissioning & Photos

Take photos of the following items for documentation:

1. RaVolt Enclosure and Pad Placement: Take clear photos of the RaVolt enclosure's precise placement on the pad, showcasing its proper alignment and positioning.
2. Installed Anchoring Hardware: Capture images of the anchoring hardware, ensuring it is securely fastened to maintain stability.
3. Drip Edge Installation: Photograph the drip edge installed on top of the enclosure, ensuring proper installation to protect against water ingress.
4. Conduit Connections: Document all conduit connections, both at the entry and exit points, to verify correct installations.
5. Grounding & Neutral to Ground Bond: Take photos of the grounding and neutral-to-ground bond connections to ensure proper electrical grounding.
6. Load Center Terminations: Capture images of the AC output terminations, showing the connection of 2 hot wires, 1 neutral wire, and 1 ground wire.
7. Disconnect Terminations: Photograph the grid/gen input disconnect terminations, showing the connection of 2 or 4 hot wires, 1 or 2 neutral wires, and 1 or 2 ground wires.
8. DC Disconnect Terminations: Document each PV string's termination within the DC disconnect, verifying proper connections.
9. Two-Wire Start Termination: Capture the termination of the two-wire start at the Sol-Ark inverter to ensure proper setup.
10. Trickle Charge Termination: Photograph the trickle charge termination at the terminal blocks within the RaVolt enclosure, verifying the connection.
11. Battery Communication Cables: Document the battery communication cables, ensuring they are appropriately connected.
12. Heater and Fan Settings: Capture images of the heater and fan settings, confirming proper configurations.
13. Notable Issues or Blemishes: Take photos of any notable issues or blemishes on the equipment for reference and further assessment.
14. Placed Labels: Ensure all labels are photographed, providing a comprehensive record of their correct placement.
15. Communication Connections: Document all communication connections to verify proper setup.
16. Functioning Wi-Fi Dongle: Confirm that the Wi-Fi dongle is functional and properly connected.
17. Additional RaVolt Options: If applicable, capture images of any additional RaVolt options specific to the project.

Commissioning Steps

1. Once all terminations are completed, and a successful QA/QC walkthrough has been conducted, the RaVolt system is prepared for activation. Follow the steps below to ensure the equipment's safety and functionality.

2. Before powering up any aspect of the system, ensure that ALL breakers and disconnects are set to the OFF position. This precaution is essential for a safe and controlled start-up process.

Battery Commissioning

1. Ensure that all battery switches are in the "OFF" position. Also, check to confirm that all communication cables are correctly connected.
2. Turn on one battery and use a voltmeter to verify the voltage. Check if the Sol-Ark is reading a similar voltage. In case the batteries are showing 0V, restart the battery unit and retake the voltage measurement.
3. Once the Battery Voltage is confirmed to be reading correctly, you may proceed to turn on the rest of the batteries in the system. If battery voltages differ across battery units, don't worry, as the system will automatically balance all battery cells during its initial 1-2 days of operation.
4. Verify that the battery Dip Switch settings match the diagram provided in the Powersync installation manual (also available in the "Dual Cabinet Terminations" section of this document).
5. Confirm that the "LI-Batt Info" tab is visible under the system setup options. Click on the Li-Batt Info tab to ensure that real data is being read, and not just displaying all zeros (take a photograph of this screen for confirmation).

PV Commissioning

1. Make the MC4 home run connections on string one at the array to provide DC power to the DC disconnect.
2. Use a voltmeter to measure the voltage on string one.
3. Disconnect string one and repeat this process on all available PV strings coming to the DC disconnect.
4. Once all string voltages are verified and correct, replace the DC disconnect cover and make all MC4 home run connections at the array.
5. Turn the DC disconnect dial from the "OFF" position to "ON." This will send power to the Sol-Ark inverter.
6. Turn the PV disconnect switch on the Sol-Ark inverter (Located on the left side of the inverter, inside the RaVolt Enclosure) from the "OFF" position to "ON." (The disconnect switch is "ON" in the horizontal, depressed position. "OFF" is the vertical position.)
7. The inverter should recognize the incoming DC voltage and light up the screen. Verify that the voltage readings on the inverter match the voltages previously verified with the voltmeter. The PV voltages can be seen by pressing the battery icon on the Sol-Ark.

Disconnect Commissioning

1. Turn off all batteries and the Sol-Ark. Then, remove the cover from the disconnect.
2. With all disconnects, breakers, and equipment off, switch on the incoming power to the disconnect. If both grid and generator inputs are present, test them individually.
3. With the disconnect set to "OFF," use a voltmeter to check the incoming voltage on the line side of the disconnect. Verify both phase-to-ground and phase-to-phase voltages to ensure a balanced incoming voltage.
4. After verifying voltages from both the grid and generator inputs at the disconnect, turn off the power to the disconnect and replace the cover.
5. Turn the power on to the disconnect and, once it's on, throw the disconnect switch to allow power to flow to the Sol-Ark.
6. Flip the "Grid" and "Gen" disconnects on the Sol-Ark to the "ON" position. The Sol-Ark should recognize the power and turn it on.
7. Verify voltage readings on the Sol-Ark screen coming from both the grid and generator inputs.
8. With the battery disconnect off, turn on the batteries individually.
9. Turn the battery disconnect on and verify that the grid and/or generator input is charging the batteries.

SAFETY IS CRITICAL! Please pay close attention to this important safety measure: Ensure that the neutral and ground are bonded together at precisely ONE location in the entire electrical system. This bonding must occur in the Load Center on the side of the RaVolt enclosure. Bonding them in any other location can result in hazardous electrical conditions.

Load Center Commissioning

1. Remove the cover of the load center to access its interior.
2. Using a voltmeter, measure the voltage of the load side. Check both phase-to-ground and phase-to-phase voltages to ensure they are balanced and within acceptable limits.
3. Operate the manual bypass switch of the load center and verify the voltages of the feed-thru lugs to confirm the load side voltage.
4. Take a moment to inspect the green screw, located in the bottom right of the Load Center. Ensure it is properly tightened down to create a Neutral-Ground Connection for the circuit. This connection is essential for safe electrical operation.
5. Once everything is checked and confirmed, replace the cover of the load center, securing it back in place.

Grid-Connected Generator Function

In a Grid-connected scenario, the generator serves as a backup solely for charging the batteries in situations when the grid becomes unavailable. During regular operation with the grid present, the grid acts as the primary power source for recharging the batteries as needed. The generator will only provide power to the RaVolt system/home when the

batteries are at a low charge during a grid outage scenario. It's important to note that, with this setup, the generator cannot directly power the house without passing through the inverters. This ensures that the RaVolt system operates efficiently and safely, relying on the grid and batteries as the main power sources while utilizing the generator as a reliable backup only for battery charging during grid outages.

Generator/Grid Battery Charging

1. Go to the Sol-Ark Battery settings' charge tab and set the Start % value to 90%.
2. If the batteries are already below 90% State of Charge (SOC), set the Start % value to a percentage 1%-3% below the current battery SOC.
3. Adjust the Sol-Ark settings for grid start and generator start values slightly below the current battery charge.
4. Go into the Grid setup/Limiter tab and deactivate the Time of Use function by unchecking the box.
5. Set the PV disconnects to "OFF."
6. Confirm that the system is running solely on battery power.
7. Run loads at the house or the enclosure until the state of charge drops to the grid/gen start values.
8. Once the grid/gen start value is reached, the generator should automatically turn on (if off-grid), or power should be supplied from the grid to charge the batteries (if grid-connected).
9. Once it is verified that the generator or grid has been called for, and the batteries are charging, the battery charging commissioning is complete.

IMPORTANT: After completing the commissioning process, make sure to reset the Start % to the value indicated in the original settings (likely 10% for off-grid installations). Also, remember to re-enable the Time of Use function by re-checking the box indicated in Step 4 above.

Wi-Fi Dongle Set-Up

NOTE: Home Wifi Network must have 2.4 GHz band available

1. Check Wi-Fi Compatibility: Before beginning the set-up process, ensure that your Home Wi-Fi Network has the 2.4 GHz band available. The Sol-Ark inverter requires this frequency band to establish a connection with the Wi-Fi dongle.
2. Refer to the Sol-Ark Manual: To gain a comprehensive understanding of the Wi-Fi dongle set-up, consult the Sol-Ark manual. The manual provides detailed step-by-step instructions, diagrams, and additional information to facilitate a smooth installation.
3. Verify Wi-Fi Dongle Power: Once the Wi-Fi dongle is connected to the inverter, verify its power status. A visible red light on the dongle indicates that it is receiving power from the inverter. This step ensures that the dongle is functioning correctly and ready for the set-up process.

4. **Connecting to EAP Wi-Fi Network:** Using your phone or computer, navigate to the Wi-Fi settings section. Locate the network named "EAP-#####" and connect to it. When connecting, you may encounter a pop-up message stating that the network has no internet access. Ignore this message, as it is normal during the set-up process.
5. **Password Entry:** During the connection process, you will be prompted to enter a password to connect to the EAP Wi-Fi network. Use the password "12345678" as provided in the set-up instructions. This password ensures the secure connection of the Wi-Fi dongle to your network.
6. **Accessing the Dongle's Setup Page:** Open a web browser on your device and type "10.10.10.1" into the address bar. This specific IP address leads you to the dongle's setup page, where you can proceed with further configurations.
7. **Scanning for Wi-Fi Networks:** Once on the setup page, scroll down to locate the Wi-Fi list and press "Scan." This action will search for available Wi-Fi networks in your vicinity.
8. **Connecting to Your Home Wi-Fi:** Identify your home Wi-Fi network (or cell modem network if applicable) from the list and click on it. You will be prompted to enter your home Wi-Fi network's password. Once entered correctly, you should see a "Set Success!" message on the setup page, indicating that the dongle is now online and connected to your Wi-Fi network.
9. **Verifying the Wi-Fi Connection:** To confirm a successful Wi-Fi connection, check for a solid green light next to the red power light on the dongle. The solid green light indicates that the Wi-Fi connection is stable and functional. However, if the green light is blinking repeatedly, it may indicate a VPN or firewall issue that requires further attention.

Settings

1. The RaVolt unit will arrive on-site with pre-configured settings.
2. Verify that all settings match the specific needs of the customer.
3. Refer to the RaVolt Standard Settings Document to confirm the accuracy of factory settings.
4. If any adjustments or clarifications are required, contact the RaVolt team for further assistance.
5. Thoroughly review and verify the settings to ensure the RaVolt unit is tailored to meet the customer's requirements and operates optimally for their unique setup.