

Before Landing On-Site

A successful solar system installation requires a comprehensive grasp of all the components and steps involved in the process. As an installer, your expertise is crucial in ensuring that each element functions harmoniously to harness the sun's energy effectively, providing sustainable power solutions for your customers. This guide aims to equip you with the essential knowledge needed before embarking on a solar system installation project.

Whether you're a seasoned professional or new to the field, this guide will assist you to approach each installation with confidence. As you read through the following checklist, consider it a toolkit for success.

1. Site Information:

- Address and GPS coordinates of the installation site.
- Site accessibility, including parking and entry points.
- Site owner or customer contact information.
- Any site-specific restrictions or regulations.

2. Project Scope and Components:

- A detailed list of components to be installed, including solar panels, inverters, batteries, generator, and any additional equipment.
- Specifications and technical data for each component.

3. Design and Layout:

- Design plans, drawings, and schematics showing the layout of panels, inverters, batteries, and other equipment.
- Placement and orientation of solar panels for optimal energy production.
- Location of main electrical panel and connection points.

4. Tools and Equipment:

- List of required tools and equipment for installation (drills, wrenches, meters, etc.).
- Any specialized tools needed for specific components.

5. Safety Precautions:

- Required personal protective equipment (PPE) such as gloves, helmets, safety glasses, and appropriate footwear.
- Safety protocols, including how to work with electricity safely.

6. Electrical and Wiring Knowledge:

- Knowledge of AC and DC electrical systems, including wire sizing, voltage, and grounding requirements.
- Understanding of color coding for different types of wires (red for positive, black for negative, green for ground, etc.).

7. Equipment Specifications:

- Detailed technical specifications for each component, including voltage, current, power ratings, and compatibility requirements.

8. Installation Instructions:

- Manufacturer's installation instructions for solar panels, inverters, batteries, and any other equipment.
- Proper mounting techniques and hardware for securing equipment.

9. System Configuration:

- Understanding of series and parallel connections for batteries and solar panels.
- Configuration settings for inverters, including grid-tie or off-grid mode.

10. Cable Management:

- Strategies for organizing and routing cables to prevent tangling, damage, and interference.
- Proper cable management techniques to ensure a neat and organized installation.

11. Site Preparation:

- Knowledge of any required site preparation tasks, such as clearing debris or leveling the ground for mounting structures.

12. Local Regulations and Codes:

- Familiarity with local building codes, zoning regulations, and permit requirements.
- Compliance with utility interconnection and grid connection standards.

13. Troubleshooting Skills:

- Basic troubleshooting techniques for diagnosing common issues during installation.
- Knowing when to seek technical support from manufacturers or experts.

14. Communication and Customer Interaction:

- Effective communication skills for interacting with the customer, addressing questions, and explaining the installation process.

15. Environmental Considerations:

- Awareness of environmental factors that may affect the installation process, such as weather conditions and potential shading.

16. Documentation:

- Record-keeping practices for documenting installation steps, serial numbers, measurements, and configurations.

Arriving On-Site

As you step onto the installation site, your role as an installer takes on a critical significance. Before you commence any activities, we emphasize the importance of adhering to rigorous safety protocols and a comprehensive understanding of all system components.

Your expertise in system components, configurations, and interconnections is vital not only for the system's functionality but also for the safety of yourself, your team, and the property. It's imperative that you have familiarized yourself with the operation and maintenance manuals for each component, as this knowledge will guide your actions on-site.

Each step of the installation demands careful attention, adherence to best practices, and proactive problem-solving. Our commitment to quality and safety extends beyond completion; it's woven into every stage of the installation process.

As you proceed with the installation, prioritize safety above all else. Be vigilant in following safety guidelines, utilizing personal protective equipment, and employing safe work practices. If any uncertainty arises during the process, take the time to consult manuals, double-check configurations, and communicate with your team.

1. Site Assessment and Planning:

- Evaluate the site's sun exposure throughout the day and year, considering shading from nearby structures or vegetation.
- Determine the optimal placement of solar panels on rooftops, ground-mounted racks, or other suitable surfaces.
- Calculate the tilt angle and orientation of the panels for maximum energy production based on the site's latitude.

2. Safety Precautions:

- Prioritize safety by wearing appropriate personal protective equipment (PPE) such as gloves, helmets, and safety glasses.
- Make sure to disconnect the main electrical panel before starting any work on the solar system to prevent electrical hazards.

3. Solar Panel Installation:

- Securely mount solar panels on racks or frames using appropriate hardware to withstand wind and weather conditions.
- Ensure proper spacing between panels to allow for ventilation and minimize shading.
- Follow the manufacturer's guidelines for panel orientation and tilt angle to optimize solar energy capture.
- Attach junction boxes and wiring conduits to panels, keeping all wiring protected from environmental factors.

4. Battery Installation:

- Carefully unpack the provided batteries and ensure they are in optimal condition.
- Place the batteries inside the designated racks within the RaVolt unit cabinet, ensuring they are secure and level.
- Connect the double-lugged positive terminal of each battery bank to the designated top left terminal.
- Utilize the interconnecting wires provided to establish connections between two battery banks. Connect the positive and negative terminals accordingly.
- Employ the provided bus bars to create connections between all battery terminals for a cohesive battery bank arrangement.
- Attach the touch-safe covers to the battery terminals to ensure safety and prevent accidental contact.

5. Inverter Installation:

- Gently position the inverter within the designated space inside the RaVolt unit cabinet.
- Carefully route the required cabling for power input, output, and communication, keeping them organized and free from obstructions.
- Attach the necessary conduit and cable clamps to secure and protect the cables within the cabinet.

6. Final Arrangement:

- Verify that all cables are correctly connected and organized within the RaVolt unit cabinet.
- Confirm that all components are securely fastened and positioned according to the provided layout and guidelines.
- Inspect the overall arrangement to ensure cables are free from pinching or any potential sources of damage.
- Double-check that the inverter and battery connections are secure and snug.
- Refer to the installation manual and the provided layout drawings to ensure the final setup adheres to specifications.

7. Generator Integration:

- If the system includes a generator, ensure it's installed in a well-ventilated area with proper clearance for exhaust.
- Connect the generator to the transfer switch or load center following manufacturer instructions.
- Verify that the generator is properly synchronized with the solar system and ready for automatic backup.

8. Cable Layout and Management:

- Plan cable routes to avoid interference with other electrical systems and to minimize voltage drop.
- Use conduits, cable trays, and clips to secure and protect cables from physical damage and weather exposure.
- Separate and label different cable types (DC, AC, communication) to simplify future maintenance and troubleshooting.

9. Connection and Wiring:

- Terminate and secure all cable connections using appropriate connectors, lugs, and terminal blocks.
- Ensure that the correct torque is applied to terminal connections to prevent loose connections over time.
- Follow color coding standards for positive (red), negative (black), and ground (green or bare) conductors.

10. Confirm Fan and Heater System:

- Check that the fan within the RaVolt cabinet is functioning properly. Ensure it's providing adequate ventilation to keep the components cool.
- Verify that the thermostats controlling the fan and heater are set to the appropriate temperatures according to manufacturer recommendations. This ensures efficient cooling and heating as needed for optimal system performance.

11. Testing and Commissioning:

- Conduct a thorough system test by turning on the solar system and monitoring its performance.
- Verify that solar panels are generating power, the inverter is converting DC to AC power, and batteries are charging as expected.
- Test the generator backup by simulating power outage scenarios and ensuring a seamless transition.

12. Monitoring and Maintenance:

- Set up monitoring equipment to track the system's energy production, battery status, and overall performance.
- Provide the system owner with guidance on routine maintenance tasks, including cleaning panels and inspecting connections.
- Train the owner on interpreting monitoring data and recognizing any potential issues.

13. Documentation and Compliance:

- Create a comprehensive installation report detailing the system's configuration, wiring diagrams, and manufacturer specifications.
- Ensure compliance with local regulations, obtain necessary permits, and maintain records for future reference.

14. Troubleshooting and Support:

- Prepare to troubleshoot and diagnose any issues that may arise after installation, providing prompt assistance to the customer.
- Familiarize yourself with the operation and maintenance manuals for all components, ensuring accurate support.

Always refer to the specific manuals and guidelines provided by manufacturers for each component to ensure proper installation, operation, and maintenance of the solar system.