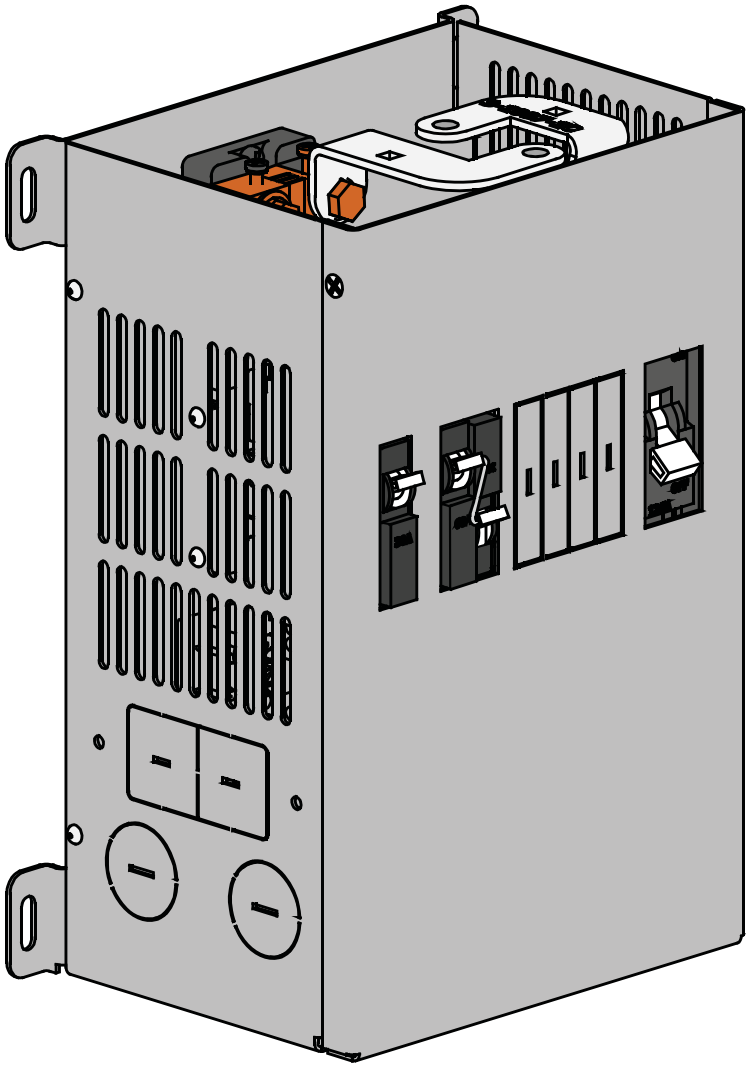

MNE125LR-120S

Little Rosie Breaker Box

Owner's Manual

MidNite Solar, Inc

Disclaimer of Liability

The use of this manual and the conditions or methods of installation, operation, use, and maintenance of the MNE125LR-120S fall beyond the control of MidNite Solar. Consequently, the company assumes no responsibility and expressly disclaims any liability for loss, damage, or expense—whether direct, indirect, consequential, or incidental—that may arise from or be connected with such installation, operation, use, or maintenance.

Restrictions on Use

The MNE125LR-120S is intended for use in life support devices or systems only with the express written approval of MidNite Solar. If this inverter fails, it could reasonably lead to the failure of the life support device or system, potentially affecting the safety and effectiveness of that equipment. In such cases, the health of the user or other individuals may be endangered.

Copyright Notice

Document Information

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Part Number and Revision – 10-611-1, Rev A

Contact Information

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Continuous Improvements and Product Updates

Please note that due to ongoing improvements and product updates, the images depicted in this manual may not precisely match the unit you have purchased.

Color Diagrams

This manual is printed in black and white, but a downloadable version in color is available on our website at: www.MidNiteSolar.com

Safety Information

For safety and to reduce the risk of electrical shock, fire, or other hazards, this manual uses specific symbols. The following symbols provide visual cues to highlight critical safety instructions, potential dangers, and additional information as needed:

WARNING: This symbol indicates a critical alert. Failure to take the recommended action could result in physical harm. Be sure to heed any accompanying warnings.

CAUTION: This symbol indicates a risk of equipment damage. Follow the recommended actions to avoid breakage.

Info: This symbol offers additional information that can help you understand important points better. While it's not a warning, this information is valuable for a full understanding.

IMPORTANT PRODUCT SAFETY INSTRUCTIONS

This manual contains important safety instructions for installing and operating the Little Rosie. Before installation or use, read all instructions and safety information in this manual. Familiarize yourself with the following information to ensure safe operation:

- Electrical Work Compliance: All electrical work must adhere to local, state, and federal electrical codes. Follow these regulations to minimize risks associated with electrical shock or fire.
- Indoor Installation Only: This product is designed for indoor or compartmentalized installation. Avoid exposure to rain, snow, moisture, or any liquids that could compromise safety.
- Insulated Tools: When performing maintenance or installation, use insulated tools. This precaution reduces the risk of electrical shock or accidental short circuits.
- Remove Jewelry: Prior to working on the inverter, remove all jewelry (such as rings, watches, bracelets). This prevents accidental contact with live components.
- Disconnect Energy Source: Always disconnect batteries or the energy source before installing or maintaining the inverter. Remember that live power may exist at multiple points due to the inverter's dual use of batteries and AC. Even if the inverter is turned off, AC power can still flow through it.
- Verify Wiring: The conductor insulation must be approved for the specific voltage, operation, temperature, and location of use. Ensure wire connections are secure to prevent hazards.

Remember to follow these safety instructions diligently to maintain a secure environment and prevent accidents. Safety first!

IMPORTANT BATTERY SAFETY INSTRUCTIONS

- Eye Protection: When working with batteries, wear safety glasses to protect your eyes.
- Remove Jewelry: Prior to battery installation or maintenance, remove all jewelry (such as rings, watches, bracelets). This minimizes the risk of accidental contact with live components.
- Lifting Techniques: Use proper lifting techniques when dealing with batteries. Proper lifting reduces strain and prevents injuries.
- Battery Selection: Avoid old or untested batteries. Check each battery's label for information on age, type, and date code. Ensure all batteries are identical.
- Temperature Sensitivity: Some batteries are sensitive to temperature changes. Install batteries in a stable environment to maintain their performance.
- Ventilation: For safety, install batteries in a well-ventilated area. Some batteries can produce explosive gases. In compartment or enclosure installations, always vent batteries to the outside.
- Air Space: Provide at least one inch (2.5 cm) of air space between batteries. Optimum cooling helps prevent overheating.
- Verify Polarity and Voltage: Always verify proper polarity and voltage before connecting batteries.
- Avoid Short-Circuits: Do not short-circuit the batteries. Short circuits can lead to fire or explosion.
- Accidental Exposure: In case of battery acid exposure, wash thoroughly with soap and water. For eye exposure, flood eyes with running water for at least 15 minutes and seek immediate medical attention.

SAVE ALL INSTRUCTIONS

Safety Information

Informations de sécurité

Pour des raisons de sécurité et afin de réduire les risques de choc électrique, d'incendie ou d'autres dangers, ce manuel utilise des symboles spécifiques. Les symboles suivants servent de repères visuels pour mettre en évidence les instructions de sécurité essentielles, les dangers potentiels et les informations supplémentaires, le cas échéant:

AVERTISSEMENT: Ce symbole constitue une alerte critique. Ignorer l'action spécifiée pourrait entraîner des blessures physiques. Soyez attentif à toutes les mises en garde associées à ce symbole.

ATTENTION: Lorsque vous rencontrez ce symbole, faites preuve de prudence. Ne pas suivre l'action spécifiée peut entraîner des dommages à l'équipement. Prenez les précautions nécessaires pour éviter les conséquences indésirables.

Info: Ce symbole fournit des informations supplémentaires qui complètent ou mettent en évidence des points importants. Bien qu'il ne signale pas un danger immédiat, il est essentiel d'assimiler ces informations pour une compréhension globale.

INSTRUCTIONS IMPORTANTES DE SÉCURITÉ DU PRODUIT

Ce manuel contient des instructions de sécurité essentielles pour l'installation et l'utilisation du Little Rosie. Avant l'installation ou l'utilisation, lisez attentivement toutes les instructions et informations de sécurité contenues dans ce manuel. Familiarisez-vous avec les éléments suivants pour garantir un fonctionnement sûr:

- Conformité aux travaux électriques: Tous les travaux électriques doivent respecter les codes électriques locaux, étatiques et fédéraux. Suivez ces réglementations pour minimiser les risques liés aux chocs électriques ou aux incendies.
- Installation en intérieur uniquement: Ce produit est conçu pour une installation en intérieur ou dans un compartiment. Évitez toute exposition à la pluie, à la neige, à l'humidité ou à tout liquide pouvant compromettre la sécurité.
- Outils isolés: Lors de la maintenance ou de l'installation, utilisez des outils isolés. Cette précaution réduit le risque de choc électrique ou de courts-circuits accidentels.
- Retrait des bijoux: Avant de travailler sur l'onduleur, retirez tous les bijoux (comme les bagues, montres, bracelets). Cela évite tout contact accidentel avec les composants sous tension.
- Déconnexion de la source d'énergie: Déconnectez toujours les batteries ou la source d'énergie avant d'installer ou de maintenir l'onduleur. Rappelez-vous que le courant peut être présent à plusieurs points en raison de l'utilisation double de l'onduleur (batteries et courant alternatif). Même si l'onduleur est éteint, le courant alternatif peut toujours circuler.
- Vérification du câblage: L'isolation des conducteurs doit être approuvée pour la tension spécifique, le fonctionnement, la température et l'emplacement d'utilisation. Assurez-vous que les connexions sont sécurisées pour éviter les risques.

N'oubliez pas de suivre ces instructions de sécurité avec diligence pour maintenir un environnement sécurisé et prévenir les accidents. La sécurité avant tout!

INSTRUCTIONS IMPORTANTES DE SÉCURITÉ DES BATTERIES

- Protection des Yeux: Lorsque vous travaillez avec des batteries, portez des lunettes de sécurité pour protéger vos yeux.
- Retirez les Bijoux: Avant l'installation ou la maintenance de la batterie, retirez tous les bijoux (comme les bagues, montres, bracelets). Cela réduit le risque de contact accidentel avec des composants sous tension.
- Techniques de Levage: Utilisez des techniques de levage appropriées lors de la manipulation des batteries. Un levage correct réduit la tension et prévient les blessures.
- Sélection des Batteries: Évitez les batteries anciennes ou non testées. Vérifiez l'étiquette de chaque batterie pour connaître son âge, son type et son code de date. Assurez-vous que toutes les batteries sont identiques.
- Sensibilité à la Température: Certaines batteries sont sensibles aux variations de température. Installez les batteries dans un environnement stable pour maintenir leurs performances.
- Ventilation: Pour des raisons de sécurité, installez les batteries dans un endroit bien ventilé. Certaines batteries peuvent produire des gaz explosifs. Dans les installations en compartiment ou enceinte, ventilez toujours les batteries vers l'extérieur.
- Espace d'Air: Laissez au moins un pouce (2,5 cm) d'espace d'air entre les batteries. Un refroidissement optimal aide à prévenir la surchauffe.
- Vérifiez la polarité et la tension : Toujours vérifier la polarité et la tension appropriées avant de connecter les batteries.
- Évitez les Courts-Circuits: Ne court-circuitez pas les batteries. Les courts-circuits peuvent entraîner un incendie ou une explosion.
- Exposition Accidentelle: En cas d'exposition à l'acide de la batterie, lavez abondamment à l'eau et au savon. En cas d'exposition aux yeux, rincez les yeux avec de l'eau courante pendant au moins 15 minutes et consultez immédiatement un médecin.

CONSERVEZ TOUTES LES INSTRUCTIONS

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1.0 Introduction

The MNE125LR-120S Breaker Box, or "LR-BB," offers the perfect blend of affordability, convenience, and simplicity. This pre-wired, factory-integrated system is designed for easy, single-person field installation, making the setup process hassle-free. With MidNite Solar's Little Rosie Series Inverters/Chargers, installation has never been more streamlined. Simply mount the LR-BB, position the Little Rosie inverter on top, connect the battery bank, and, if needed, integrate AC power from either a generator or utility source. Efficiency meets flexibility in one neat package.

The LR-BB consolidates all essential AC and DC disconnects and wire connection points into one compact, self-contained enclosure. This design offers a significant advantage by reducing both installation time and costs compared to traditional setups that rely on multiple interconnected components.

Engineered to simplify renewable energy or inverter system installations, the LR-BB features integrated battery disconnects, AC input and output overcurrent protection, grounding connections, a DC Shunt, and a full-system inverter bypass switch, ensuring effortless inverter isolation during battery maintenance.

Beyond its efficiency, the LR-BB prioritizes safety and reliability with a UL and CSA-certified, code-compliant design, delivering peace of mind and lasting performance.

1.1 Regulatory Compliance

The MNE125LR-120S is officially classified as Interconnection System Equipment (ISE) and has been rigorously tested by a Nationally Recognized Testing Laboratory (NRTL) to meet the following product safety standards and ratings:

- UL1741 Standard for Safety of Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources (Edition 2), for use in the US;
- CSA C22.2 No. 107.1, General Use Power Supplies – R2006 (Edition 3), for use in Canada.

Info: Nationally Recognized Testing Laboratories (NRTLs) are accredited organizations that comply with Occupational Safety and Health Administration (OSHA) regulations, allowing them to conduct independent safety testing and certify products.

Ratings

- Maximum battery input: 160VDC
- Maximum PV input voltage (DC): 600VDC
- Maximum DC input short circuit current (DC): 10,000 AIC
- Operating voltage range (AC): 120VAC nominal

1.2 Standard Features

- Constructed from durable aluminum with a powder-coated finish for longevity.
- Includes inverter AC input overcurrent protection breakers for added safety.
- Pre-wired AC bypass switch with full system current capacity, along with a DC disconnect breaker for safe and efficient inverter or battery bank servicing.
- Accommodates up to four ½" (12.7mm) wide DIN rail-mounted breakers, suitable for AC or DC load breakers, or for installing PV disconnects or PV-Ground Fault Protection (PV-GFP).
- Front-mounted AC and DC breakers for straightforward operation.
- Features busbars with screw-type compression terminals—no lugs required.
- Equipped with a full-system 200-amp DC shunt for seamless integration with a state-of-charge battery monitor.
- Simplifies field wiring with front-mounted AC and DC input/output terminals.
- UL/CSA certified enclosure and components, designated for indoor use.
- Includes Neutral and Hot Busbars, making it easy to connect breakers for AC or DC loads.
- Fully compatible with MidNite's Little Rosie Inverter/Charger Series (MNLR3648M and MNLR4548RE).
- Designed with knockouts for battery cables, AC and PV input/output, DC breakers, and a GFCI for ease of installation.
- A versatile and reliable design engineered to streamline your Little Rosie inverter system installation!

1.3 Physical Features

- LR-BB dimensions (H x W x D): 12" x 9" x 6.25" (30.5 cm x 22.9 cm x 15.9 cm)
- LR-BB weight: 5.5 lbs. (2.5 kg)
- Shipping dimensions (H x W x D): 15" x 11" x 9.5" (38.1 cm x 27.9 cm x 24.1 cm)
- Shipping weight: 7.0 lbs. (3.2 kg)

1.4 External Features

As shown in Figure 1-1 and Figure 1-2, the main features found on the outside of the LR-BB enclosure are:

1. **Mounting Feet (x4)** – Four holes for mounting the enclosure. See Figure 2-2 for size information on these holes.

2. **Ventilation Openings (Left Side)** – Opening to allow cool air to enter.

3. **GFCI Knockout** – Knockout to allow a GFCI outlet to be installed.

4. **Conduit Knockouts** – Knockouts to allow metal and PVC conduits. For dimensions and sizes see Section 2.3.

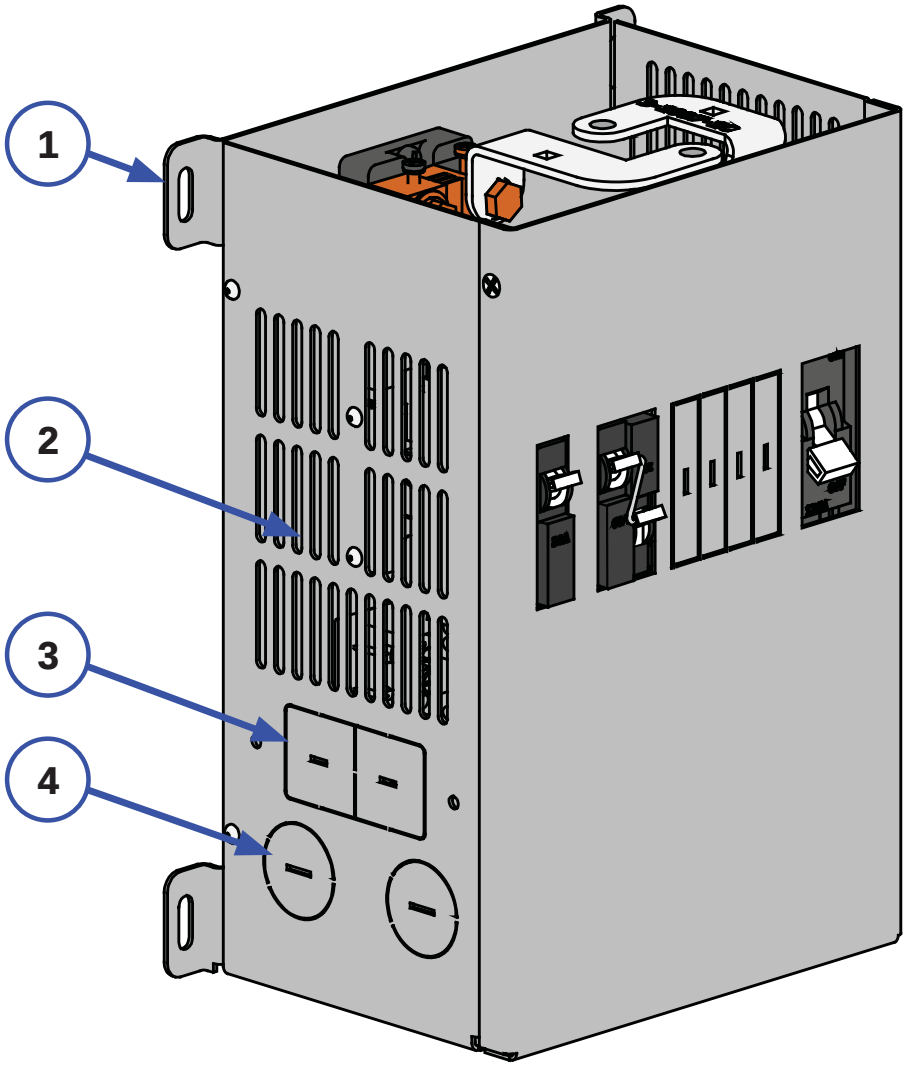

Figure 1-1, LR-BB's Outside Features - Left Side

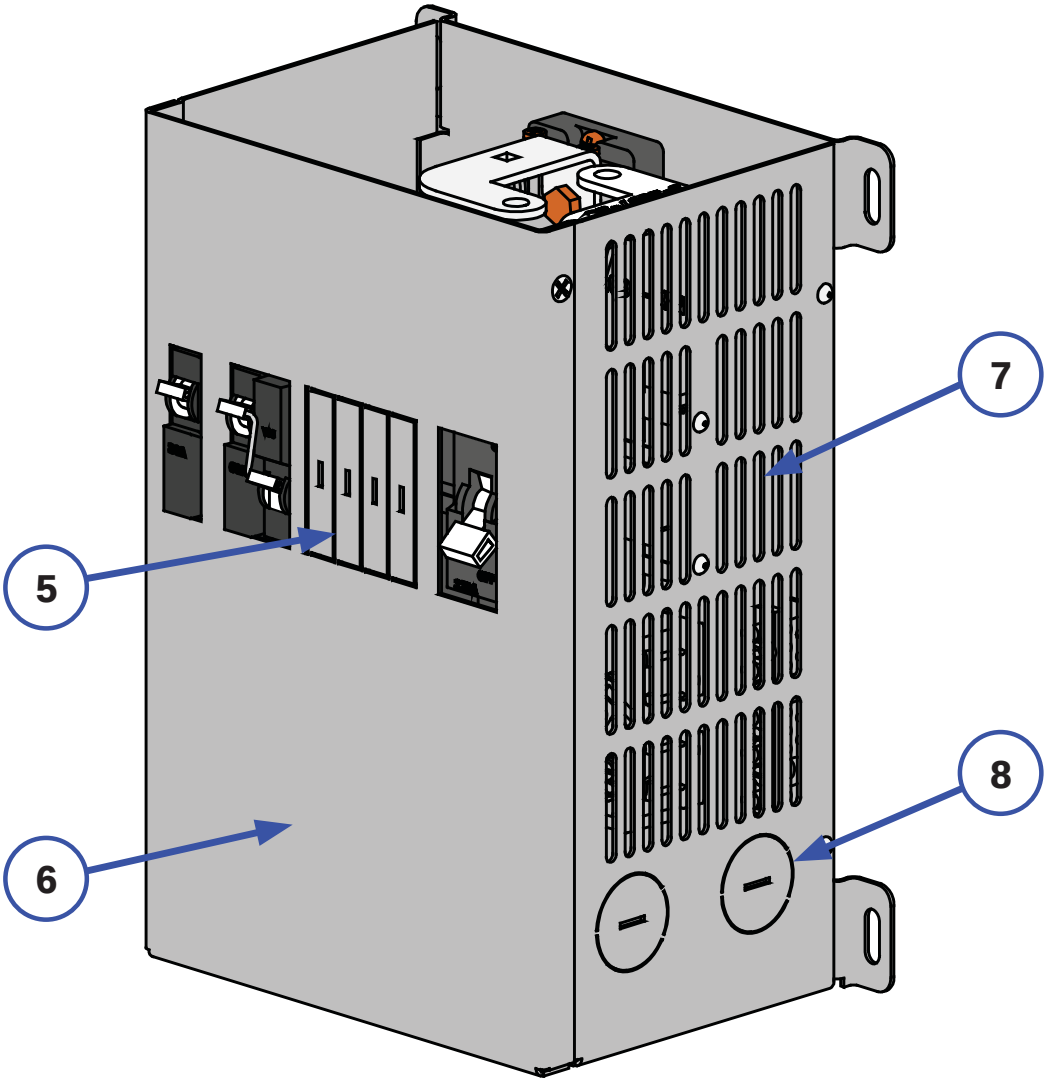

Figure 1-2, LR-BB's Outside Features - Front & Right Side

5 **Breaker Knockouts** – Knockouts to allow up to four DIN-rail mount breakers to be installed. For information see Section A.2.

6 **Front Cover** – The front cover is removed to allow access to the internal components. Three #8-32, flat-head Phillips screws are used to hold the front cover to the enclosure.

7 **Ventilation Openings (Right Side)** – Opening to allow cool air to enter.

8 **Conduit Knockouts** – Knockouts to allow metal and PVC conduits. For dimensions and sizes see Section 2.3.

Note: Additional knockouts are located on the bottom, see Figure 2-2.

1.5 Internal Features

The following features are located inside the LR-BB (refer to Figure 1-3):

1. **DC Shunt** – This shunt is pre-installed so that a State Of Charge battery monitor (such as MidNite's WhizBang Jr.) can be installed. For more information see Section A.1 in Appendix A.
2. **Battery Negative Input Connection** – For connecting the negative side of the battery source. For more information see Section 2.7.
3. **AC Input Breaker** – This AC breaker provides a way to disconnect and provide overcurrent protection to the AC input to the inverter. For more information see Section 2.8.
4. **AC Hot Input Terminal** – For connecting the incoming AC source (utility/generator). For more information see Section 2.8.
5. **Inverter Out/Bypass Breaker Assembly** – The AC breaker assembly includes an inverter output disconnect and bypass switch, providing overcurrent protection and allowing inverter bypass when necessary. See Section 3.0 for operation details.
6. **Neutral Busbar** – Used to connect the AC input and output neutrals. For more information see Section 2.8.
7. **AC Output Busbar** – Used to connect inverter loads (i.e. electrical panel). For more information see Section 2.8.
8. **DIN Rail Mounting Track** – For installing up to four 1/2" (12.7mm) wide, DIN rail-mounted breakers. See Section A.2.
9. **Inverter's DC Negative Connection** – Inverter's DC negative terminal connects to the top of this busbar. See Figure 2-5.
10. **Inverter's DC Positive Connection** – Inverter's DC positive terminal connects to the top of this busbar. See Figure 2-5.
11. **Battery Breaker** – This disconnect isolates the inverter from the battery, ensuring NEC/CEC-compliant DC overcurrent protection when installed per manual instructions. The bottom terminal connects to the battery bank's positive terminal. See Section 2-7.
12. **Battery Positive Input Connection** – For connecting the Positive side of the battery source. Refer to Section 2-7.
13. **Ground Busbar** – This busbar is connected to the chassis and is used to tie AC and DC equipment grounds to a common point.
14. **Neutral to Ground Connection** – Ensures a direct path for fault currents to return to the source, facilitating the rapid tripping of the circuit breaker during a fault condition. Refer to Section 2.9 to determine whether this connection needs to be removed.

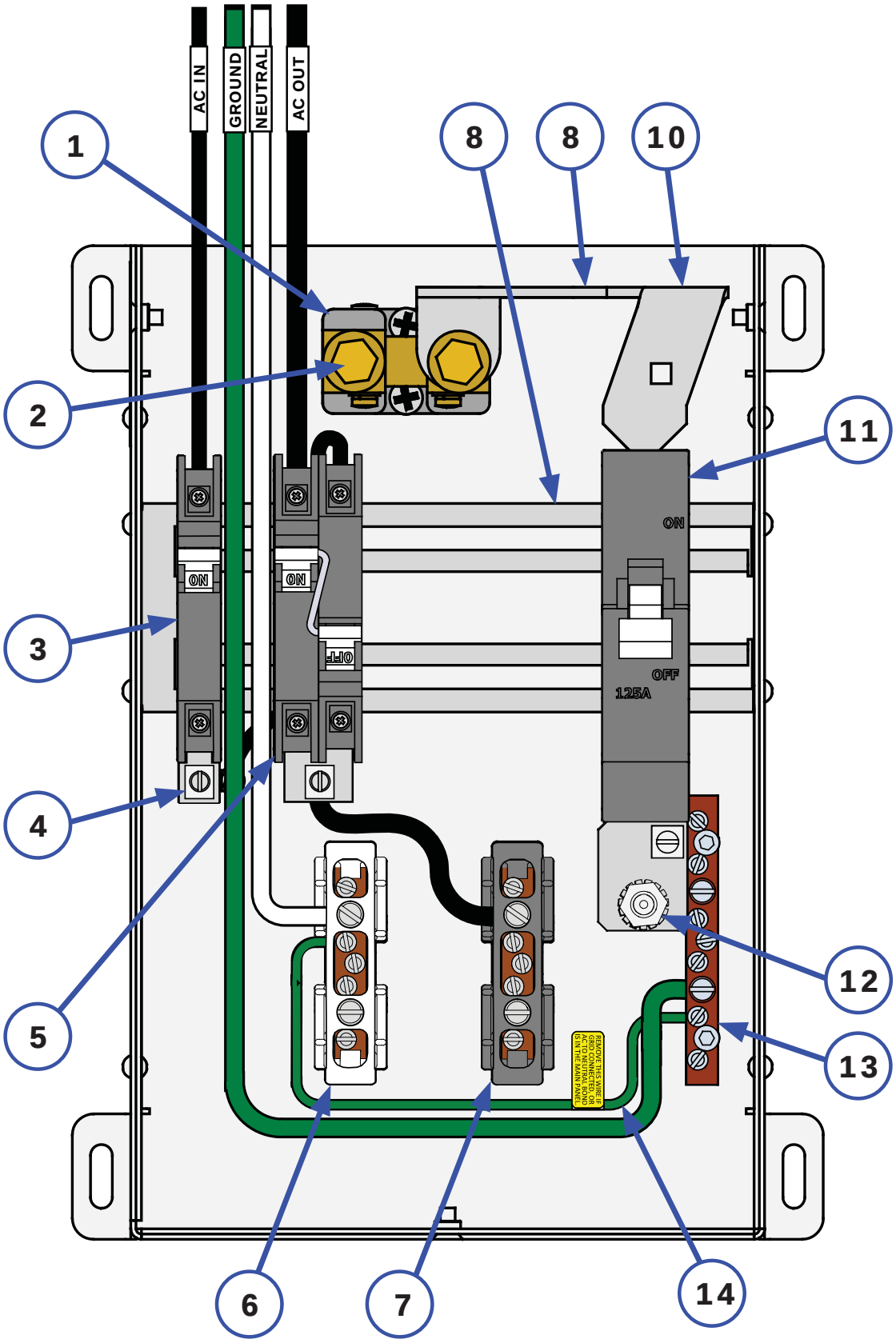

Figure 1-3, LR-BB Internal Components

2.0 Installation

WARNING: Installations should be performed by qualified personnel, such as a licensed or certified electrician. It is the installer's responsibility to determine which safety codes apply and to ensure that all applicable installation requirements are followed. Applicable installation codes vary depending on the specific location and application of the installation.

CAUTION: Review the "Important Safety Instructions" on pages ii-v before any installation.

The simplified system diagram shown in Figure 2-1 should be reviewed to assist you in planning and designing your installation. This drawing is not intended to override or restrict any national or local electrical codes, nor should it be the determining factor as to whether the installation is compliant – that is the responsibility of the electrician and the on-site inspector.

2.1 Preparation

Before proceeding, read the entire Installation section to determine how you are going to install your LR-BB enclosure. Save time and avoid common, costly mistakes by thoroughly planning before you start.

2.1.1 Unpacking and Inspection

Carefully remove the LR-BB enclosure from its shipping container and inspect all contents. Verify that the following items are included:

- LR-BB Enclosure
- Owner's Manual
- User Label Set

If items appear to be missing or damaged, contact your authorized MidNite Solar dealer or MidNite Solar.

Save your proof-of-purchase as a record of your ownership; it will also be needed if the unit should require in-warranty service.

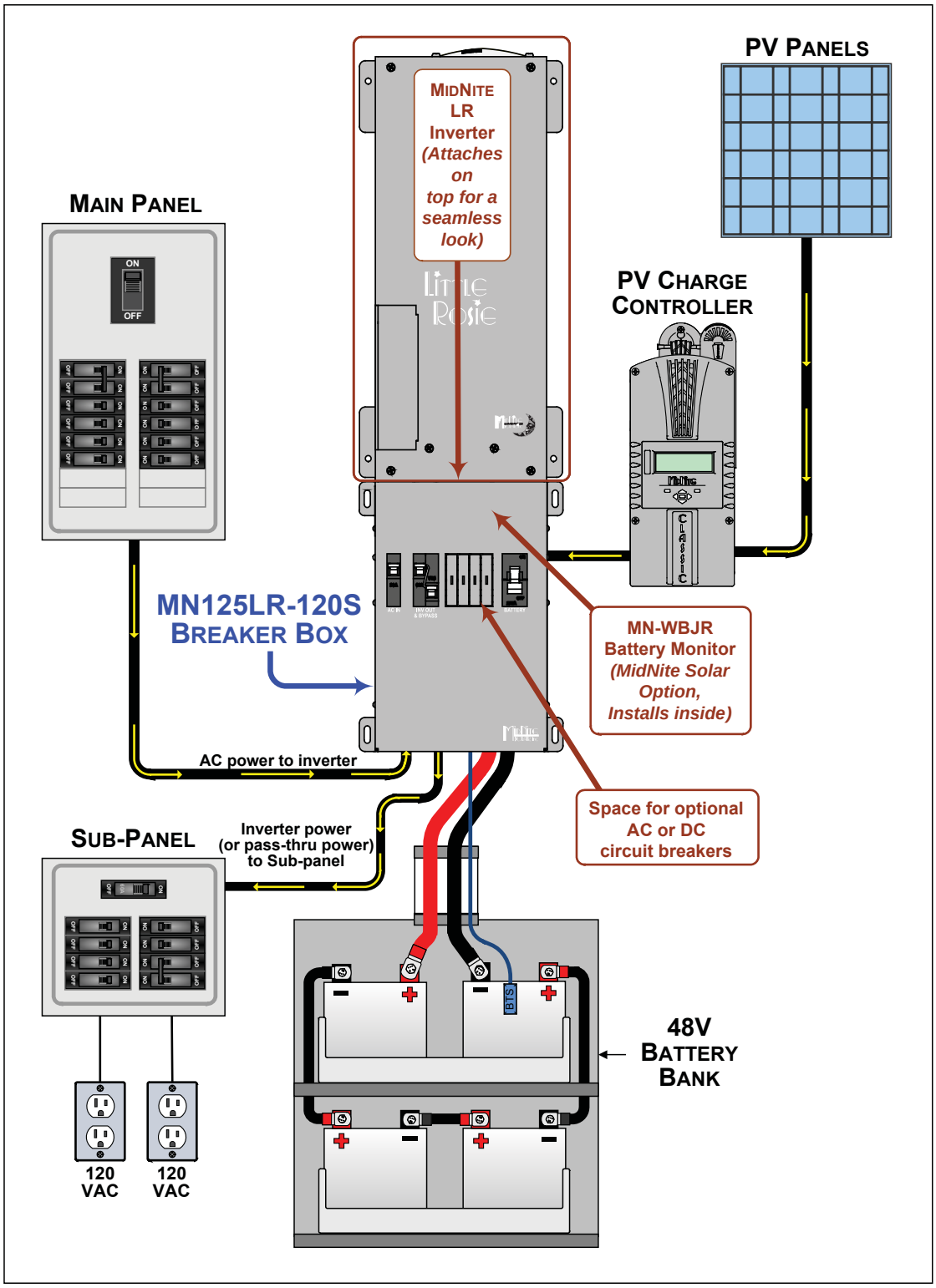

Figure 2-1, LR-BB Simplified Installation Diagram

2.2 Locating and Mounting the Inverter

Refer to the dimensional drawing in Figure 2-2 to determine an appropriate area to install the LR Breaker Box/MNLR4548RE inverter system. Install it only in a location that meets the following requirements:

Clean and Dry –

- The LR Breaker Box is rated for indoor use only.
- Avoid installing it in areas where dust, fumes, insects, or rodents can enter or block the ventilation openings.
- Ensure it is free from the risk of condensation, water, or any other liquid that can enter or fall inside the enclosure.

Ventilated – In order for the inverter to provide full output power and avoid over-temperature fault conditions:

- Do not cover or block the LR-BB ventilation openings,
- Provide at least 3 inches (7.5 cm) of airspace clearance on the left and right sides of the LR-BB enclosure to provide adequate ventilation.
- If installed in an compartment/enclosure, consider adding a fresh air intake opening to allow cool air to flow in and heated air to exit away from the inverter and enclosure.

Close to the Battery Bank – To ensure optimal performance, the LR-BB/inverter system should be situated as close to the batteries as possible. This minimizes the battery cable length, preventing efficiency loss and maintaining the inverter's overall performance due to long DC wires.

CAUTION: If using Lead-Acid vented batteries, do not install the LR-BB/Inverter system in the same compartment/room as the batteries, or in a location where it will be exposed to gases produced by the batteries. These gases are corrosive and can damage the equipment, Additionally, if these gases are not ventilated and allowed to collect, they could ignite and cause an explosion. Consult your battery supplier for proper installation requirements.

Safe – Keep any flammable or combustible material (e.g., paper, cloth, plastic) that could be ignited by heat, sparks or flames at least twelve feet away from the LR-BB/inverter system. Do not install the LR-BB/inverter system in areas containing extremely flammable liquids like gasoline or propane, or in locations requiring ignition-protected devices. Sparks from relays, circuit breakers, etc., could ignite any fumes or spills.

Accessible – Ensure that access to the front of the LR-BB enclosure remains unobstructed. Maintain a clear space of at least 36 inches (91 cm) in front to access the AC and DC wiring terminals and connections inside the LR-BB, as they will need to be periodically checked and tightened.

2.3 Conduit Knockouts

The LR-BB includes knockouts for 1/2", 3/4", 1", and 1¼" conduits (see Figure 2-2). Remove the knockout that is close to the terminal that the wire will connect to. They can be removed by tapping the edge with a straight bladed screwdriver and a hammer, then twist out with pliers.

Info: Before removing any knockouts, plan ahead by deciding whether to use cable clamps or conduit, and determine all wire routes (refer to Section 2.4.1).

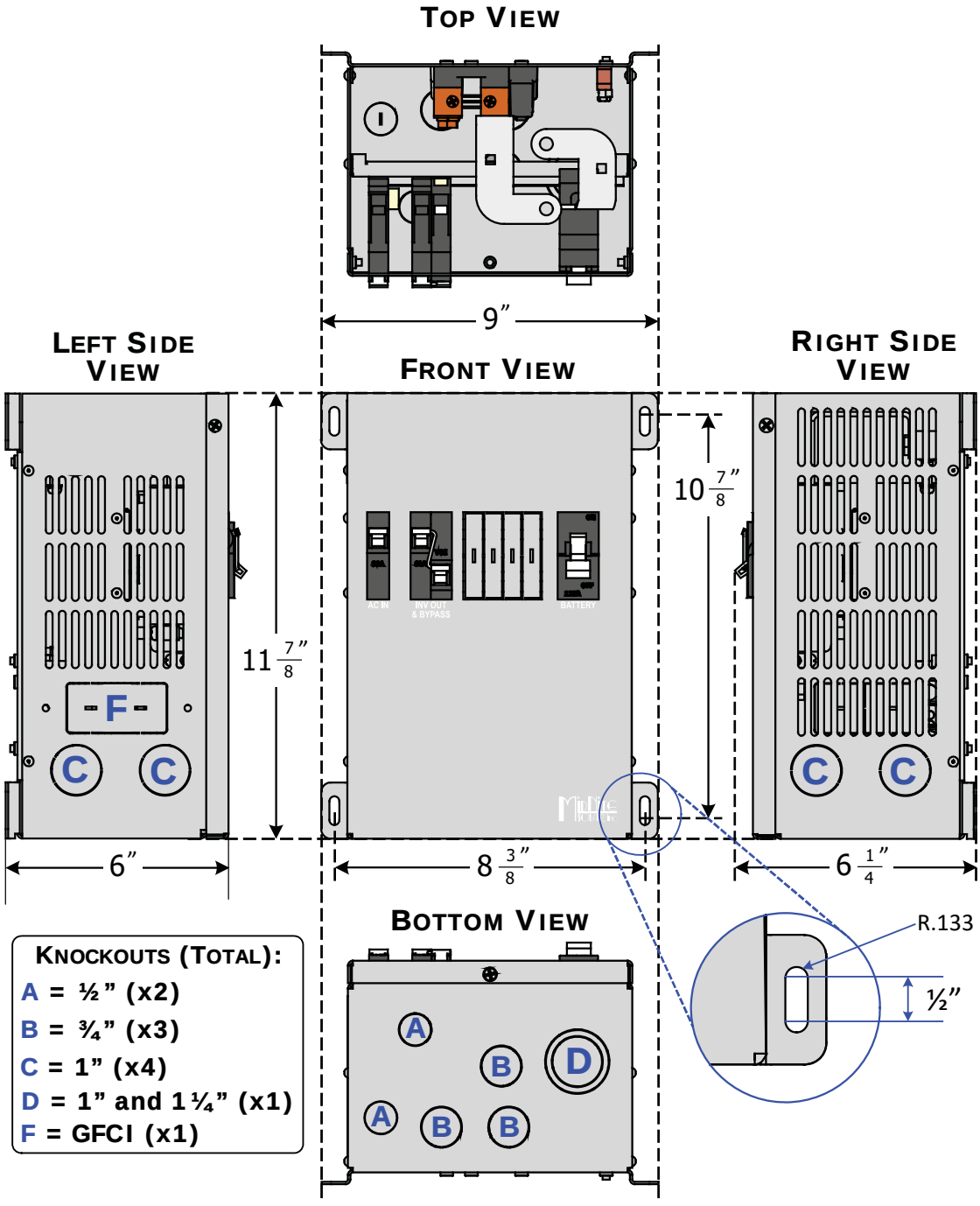

Figure 2-2, LR-BB Dimensions and Conduit Knockouts

2.4 General Wiring Requirements for the LR-BB

This section outlines the necessary requirements and recommended practices for wiring the LR-BB enclosure. Before beginning any wiring, carefully read all instructions. Ensure that all wiring complies with local codes and standards, and is completed by qualified professionals, such as licensed electricians.

For safe wiring practices in residential and commercial installations, refer to the NEC (National Electric Code, ANSI/NFPA 70) in the United States, and the CEC (Canadian Electrical Code) in Canada.

WARNING: The AC neutral is bonded to ground within this enclosure. The AC neutral must be connected to safety ground (also called a "bond") in only one location at a time, as having multiple neutral-to-ground bonds can result in "ground loop" currents, which may trip GFCIs, create electrical shock hazards, and cause other undesirable effects. If this inverter system is not your main power source and the AC circuits in your system are already bonded to ground elsewhere, you must remove the neutral to ground bond inside this enclosure. Refer to Appendix B for more information

2.4.1 Wire Routing

Determine all wire routes to and from the LR-BB enclosure and inverter.

Typical wire routing scenarios include:

AC Wiring:

- AC input from the main AC panel or a generator to the LR-BB enclosure.
- AC input and output between the LR-BB enclosure and the inverter.
- AC output from the LR-BB enclosure to the AC sub-panel or dedicated circuits.

DC Wiring:

- DC connections from the batteries to the LR-BB enclosure.
- DC connections from the inverter to the LR-BB enclosure.

Cables and Signal Wiring:

- Battery Temperature Sensor cable from the inverter to the batteries.
- Remote control cable routed through the LR-BB enclosure to the inverter.

Ground Wiring:

- Ground wires running to and from the LR-BB enclosure.

Additional Wiring:

- External DC sources (e.g., PV panels, wind turbines, or hydro systems) to the LR-BB enclosure.
- Small signal wires for battery sensors, battery monitoring, and auto generator starting.
- Wiring for attaching lightning arrestors.
- PV charge controller connections.

WARNING: Ensure all sources of DC power (i.e., batteries, solar, wind, or hydro) and AC power (utility power or AC generator) are de-energized (i.e., breakers opened, fuses removed) before proceeding—to prevent accidental shock.

2.4.2 Disconnect Switch and Overcurrent Protection

The NEC/CEC mandates a disconnect switch and overcurrent protection for all ungrounded conductors on both the AC and DC sides in residential and commercial electrical systems. The LR-BB enclosure is equipped with AC and DC circuit breakers that function as disconnect switches. These circuit breakers also serve as overcurrent protection devices, provided the ampacity, along with its insulation material, voltage, and temperature rating of the wire you use to connect to the LR-BB, is correctly matched to the DC circuit breakers. For guidance on determining the minimum recommended wire size, consult the relevant installation sections (AC Wiring or DC Wiring).

2.4.3 Wiring Requirements

- Protect AC and DC wires entering and exiting the LR-BB enclosure as required by code. This can be done by using jacketed wires or by feeding the wires through conduit.
- Secure cables/conduits to the enclosure using proper clamps or other approved methods.
- Do not mix AC and DC wiring in the same conduit. The LR-BB enclosure is specifically approved/designed for both AC and DC wiring. However, where DC wiring must cross AC (or vice-versa), ensure the wires cross at a 90° angle.
- Use only copper wires with a minimum rating of 150V, 75°C and based on an ambient temperature of 30°C.
- Ensure all conductor insulation is of a type that is approved for the voltage, operation, temperature, and location of use.
- Follow these guidelines for wire colors in systems where one conductor is grounded:

  DC negative/AC neutral (grounded conductor): Insulation must be white, gray, or any color except green. Note: If using 6 AWG or larger conductors, it can be marked with white at each termination.

  Equipment grounding conductors: Must be bare (no insulation) or have green or green-and-yellow-striped insulation or identification.

  DC positive/AC hot (hot ungrounded conductor): Typically red or black.
- Ensure connectors or terminals used for flexible, fine-stranded conductors are specifically marked or labeled for this purpose.

2.5 Torque Requirements

Adhere to the torque guidelines provided below to ensure your fasteners are properly tightened. Utilize a reliable, high-quality torque wrench to verify accurate connections. For optimal performance, it is recommended to recheck and re-torque all fasteners after five days, followed by routine checks every six months.

CAUTION: Improper torque on AC/DC connections may lead to looseness and fire hazards or fastener breakage.

Table 2-1, Torque Values for Busbars (Maximum)

Torque Values for the Ground, Neutral, and AC Output busbars
(they have different torque values for the small and large screws).

Wire Size	Busbar Screw Size Torque Values	
	10-32 (Small Screws)	5/16-24 (Large Screws)
#14 to #10 AWG	15 in. lbs. (1.7 N-m)	35 in. lbs. (4.0 N-m)
#8 AWG	20 in. lbs. (2.3 N-m)	40 in. lbs. (4.5 N-m)
#6 AWG	25 in. lbs. (2.8 N-m)	45 in. lbs. (5.1 N-m)
#4 AWG	NA	45 in. lbs. (5.1 N-m)
#3 to #1/0 AWG	NA	50 in. lbs. (5.6 N-m)

Table 2-2, Torque Value for the Shunt
(Battery Negative)

5/16-18 Bolt (use 1/2" socket)
107 in. lbs. (12.1 N-m) maximum

Table 2-3, Torque Value for the Battery Breaker Busbar
(Battery Positive)

5/16-18 Nut (use 1/2" socket)
50* - 137 in. lbs. (13.6 to 16.3 N-m) maximum

* For torque exceeding 50 in. lbs, we recommend using a crescent wrench to stabilize the busbar while tightening the nut.

Table 2-4, Torque Value for the AC Input Terminal

Wire Size	Slotted #1/4-28 Screw Torque Values
#14 to #4 AWG	57.0 in. lbs. maximum (6.4 N-m maximum)

2.6 Electrical System Wiring Diagram

Figure 2-3 depicts the AC/DC wiring for the LR-BB enclosure, serving as a general guideline. It does not override local or national electrical codes. Compliance is the responsibility of the electrician and inspector.

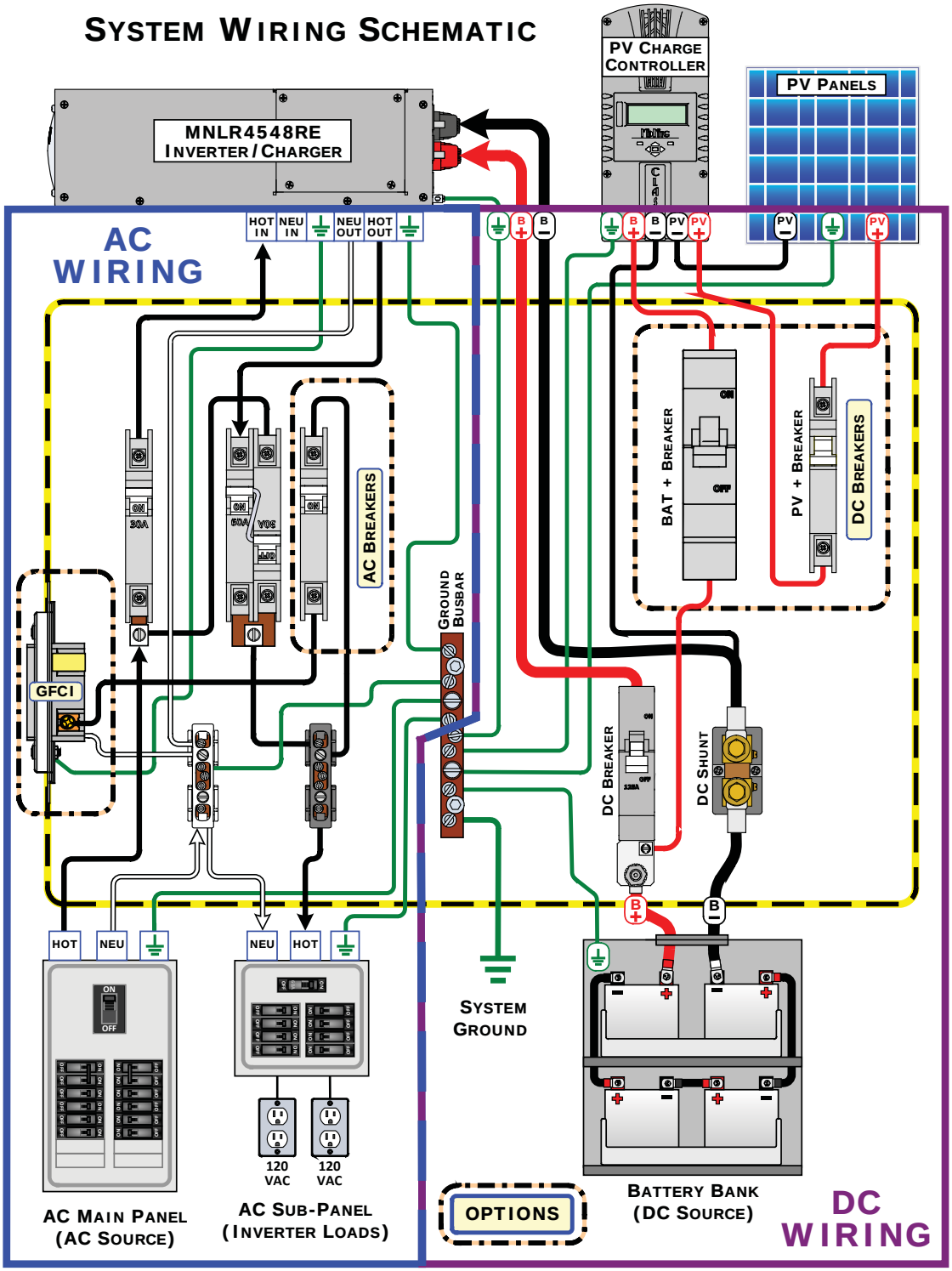

Figure 2-3, LR-BB System Wiring Diagram

2.7 DC Wiring

This section provides an overview of the DC wiring connections linking the LR-BB enclosure, the inverter, and the battery bank. For detailed connection points, refer to Figure 2-4, which illustrates the battery bank and inverter wiring (DC side) within the LR-BB enclosure. Use this diagram as a reference when configuring the DC circuits.

2.7.1 DC Wiring Guidelines

WARNING: Terminals, busbars, and electrical components inside the LR-BB enclosure may remain energized during normal operation. **DO NOT TOUCH**. Ensure all power sources are disconnected before removing the cover.

WARNING: Although DC voltage is classified as "low voltage," it poses significant hazards, especially from short circuits in the battery system.

CAUTION: Prior to wiring the DC cables, thoroughly review the safety guidelines provided at the beginning of this manual, along with the following instructions, to promote a safe and durable system.

CAUTION: Avoid connecting the battery cables to the inverter until all wiring is finalized and the correct DC voltage and polarity have been confirmed.

- Secure the DC positive and negative cables from the battery bank together every six inches using wire ties or electrical tape. This enhances surge handling, reduces inductance, improves the inverter's waveform, and minimizes wear on its filter capacitors.
- Use crimped and sealed copper compression lugs with a 5/16" hole to attach the battery cables to the DC disconnect breaker and DC shunt within the LR-BB enclosure.
- Ensure that the battery bank voltage matches the inverter's DC voltage requirements (e.g., a 48-volt battery bank for a 48-volt inverter). Failure to do so could result in damage to the inverter.
- For optimal inverter performance, limit connections between the battery bank and the inverter via the LR-BB enclosure to only the DC circuit breaker on the positive line and the DC shunt on the negative line. Additional connections could cause voltage drops and may loosen over time.
- Inspect all wiring to the inverter and battery terminals on a monthly basis to confirm proper tightness, adhering to the torque specifications outlined in Tables 2-1 to 2-4.
- Verify that the color codes for DC cables/wires are accurate: RED for positive (+), WHITE for negative (–), and GREEN, GREEN/YELLOW, or bare for DC equipment grounds.

2.7.2 DC Wiring Connection Points

Figure 2-4 shows the connection points for the DC wiring inside the LR-BB enclosure.

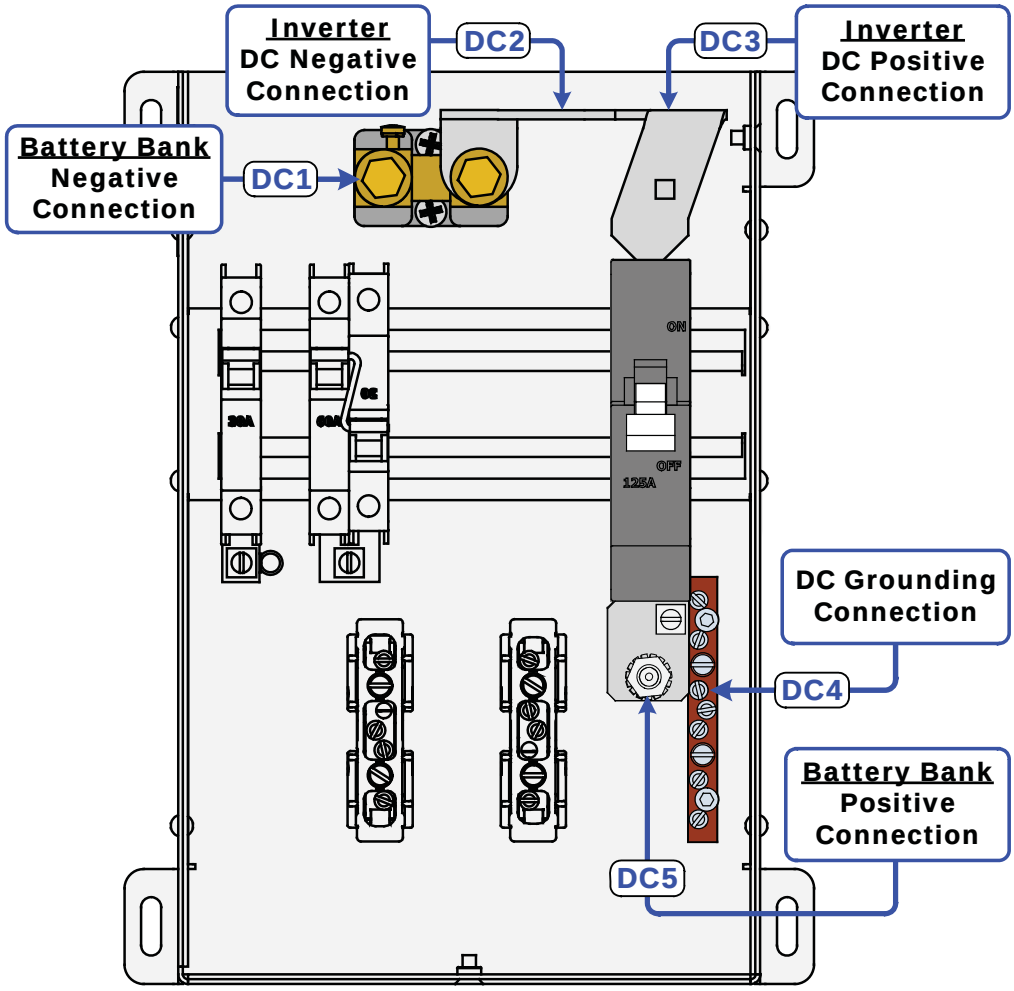

Figure 2-4, DC Wiring Connection Points

DC1	**Battery Bank Negative Connection** – Open side of DC shunt connects to the battery bank's negative terminal. Use Table 2-2 for torque requirements.
DC2	**Inverter DC Negative Connection** – Top of DC negative busbar connects to the Little Rosie inverter DC negative terminal.
DC3	**Inverter DC Positive Connection** – Top of DC positive busbar connects to the Little Rosie's DC positive terminal.
DC4	**Grounding Connection** – The equipment ground point for all equipment used in the LR-BB/inverter system. This busbar has two #14 to #1/0 AWG and seven #14 to #6 AWG screw type compression terminals. Use Table 2-1 for torque requirements.
DC5	**Battery Bank Positive Connection** – Bottom of the Battery breaker connects to the battery bank's positive terminal. Requires a lug with a 5/16" hole. Use Table 2-3 for torque requirements.

2.7.3 DC Overcurrent Protection and Disconnect

In a battery-based inverter system, the NEC/CEC assumes that each ungrounded conductor is connected to a source capable of supplying currents that exceed the conductor's ampacity rating, creating a risk of damage under fault conditions. To mitigate this risk, the NEC/CEC requires all ungrounded conductors in the inverter's DC system to be protected by an overcurrent protection device, such as a circuit breaker or fuse. These devices are not designed to safeguard equipment but to prevent conductor overheating, which could lead to a fire. Overcurrent devices achieve this by interrupting the circuit before the conductor reaches its maximum current-carrying capacity.

CAUTION: Circuit breakers or fuses on the DC side must be UL listed and specifically rated for DC applications.

The NEC also mandates a DC disconnect switch within the inverter system to enable service personnel to isolate the inverter from the battery. This disconnect may be either a DC-rated circuit breaker or switch. For example, the LR-BB system includes a 125-amp UL-listed, high-interruption-capacity, DC-rated circuit breaker. These breakers are designed to handle the significant current a battery can deliver during a short circuit and feature a time delay to prevent tripping during the high-current demands associated with powering heavy loads. When installed with the MNLR4548RE inverter's recommended minimum DC wire size (2 AWG), these breakers function as both the DC overcurrent protection device and the safety disconnect switch.

Proper wire sizing is equally important in a low voltage, high amperage system to optimize efficiency and reduce fire risks from overheating. To minimize voltage drop, avoid low voltage shutdowns, and prevent nuisance tripping of the DC breaker due to increased current draw, wire runs should be kept as short as possible. The DC cable size must be selected based on the inverter's DC current requirements, the DC breaker size, and the voltage drop to the battery bank.

If the DC circuit breaker in the LR-BB system serves as the MNLR4548RE inverter's overcurrent protection device, a minimum wire size of 2 AWG is required to ensure safe and efficient operation.

WARNING: If you use a battery cable smaller than 2 AWG, you must install a fuse/circuit breaker compatible with this smaller cable to protect against a potential fire.

2.7.4 DC Hardware Connections

Avoid placing any material or component between the DC cable lug and DC terminals (e.g., on the DC circuit breaker, DC shunt, batteries, and inverter/busbars). Ensure proper stacking of the hardware securing these connections. Incorrect installation can create a high resistance connection, potentially causing poor inverter performance or overheating that may result in melted cables and terminal connections. As an example, refer to Figure 2-5 for guidance on correctly stacking the hardware when connecting the LR-BB to the inverter.

Info: After securing the battery connections and confirming they are properly torqued, you can apply petroleum jelly or antioxidant grease/spray to the exterior of the connection. Avoid placing jelly or anti-corrosion grease between the terminal and the battery cable.

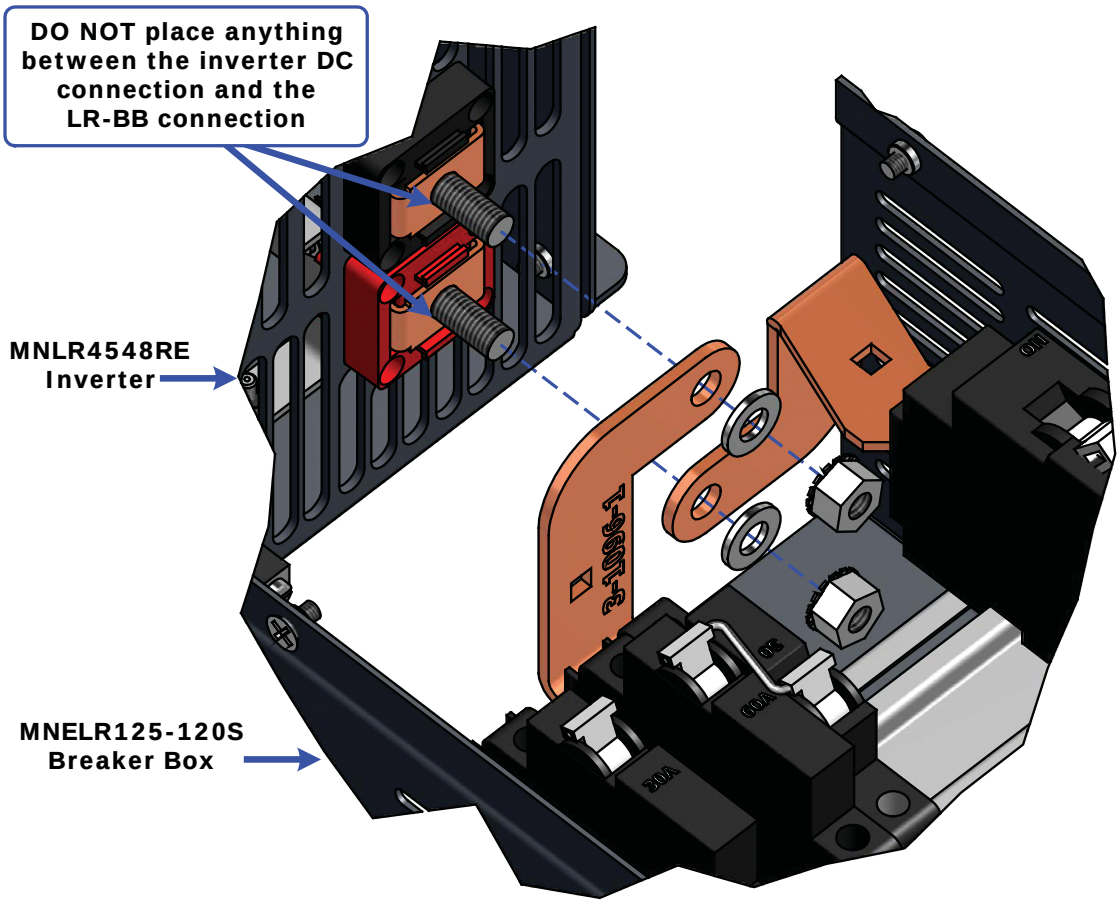

Figure 2-5, Hardware Connection to Inverter

2.7.5 Wiring the LR-BB to the Battery Bank / Inverter

WARNING: Before connecting or disconnecting battery cables, ensure that all AC and DC breakers are switched OFF and that all power sources—both AC and DC—are disconnected from the inverter.

WARNING: Lethal currents may occur if the positive and negative cables attached to the battery bank come into contact. To prevent accidental short circuits during installation or wiring, make sure all cable ends are insulated or covered.

CAUTION: Do NOT connect DC wires to the battery bank until: 1. All DC, AC, and accessory wiring is complete. 2. The correct DC and AC overcurrent protection devices have been installed. 3. The DC voltage and polarity have been thoroughly verified.

CAUTION: The MNLR4548RE inverter does NOT have reverse polarity protection. Connecting the positive (+) terminal of the battery to the negative (–) terminal of the inverter—or vice versa—will cause severe damage. Such damage is not covered under warranty. Before completing the final DC connection between the battery bank and the inverter, verify the battery voltage and polarity with a voltmeter. To minimize the risk of error, color-code the cables for clarity.

This section outlines the procedure for making DC connections between the MNLR4548RE inverter and the LR-BB enclosure, as well as from the LR-BB enclosure to the batteries (using the installer-provided battery cables).

1. Place the inverter on top of the LR-BB enclosure, ensuring the inverter's DC terminals align with the holes in the DC positive and negative busbars inside the LR-BB enclosure.
2. Route the DC cables from the battery bank (without connecting them to the battery) to the LR-BB enclosure. Connect the negative (–) cable to the left side of the DC shunt and the positive (+) cable to the bottom side of the DC breaker, maintaining proper polarity.
3. Ensure all DC wire connections (batteries, inverter, DC circuit breaker, and DC shunt) are flush with the surfaces of the DC terminals. Properly stack the hardware securing these connections (see Figure 2-5) and tighten them securely. Only close the DC circuit breaker to supply power to the inverter after completing the entire installation and verifying all connections.
4. Route an appropriately sized DC grounding wire (green or bare) from the inverter's DC equipment ground terminal and the battery bank enclosure to the ground busbar in the LR-BB enclosure. Refer to Section 2.9 for grounding information and sizing the DC ground wires.

2.8 AC Wiring

This section outlines details regarding the AC wiring within the LR-BB enclosure, including connections to and from the inverter, the incoming AC power source, and the outgoing AC distribution panel (commonly referred to as the inverter sub-panel).

2.8.1 AC Wiring Guidelines

WARNING: To minimize the risk of fire, avoid connecting a 120 VAC-only inverter to both busbars in an AC load center (circuit breaker panel) with multi-wire branch circuits. Each circuit connected to a 120 VAC panel must have its own neutral wire. Shared neutrals may lead to additive currents, potentially overloading the neutral conductor.

CAUTION: Prior to installing AC wiring, carefully review the safety information provided at the beginning of this manual and below to ensure a safe and reliable system:

- Thoroughly read all instructions and cautionary notes in the introduction and the Installation section before proceeding
- Use AC wiring that is at least #10 AWG (5.3 mm²) copper and approved for residential use.
- DO NOT connect the inverter's output to an AC power source, as this may cause severe damage to the inverter, which is not covered under warranty.

CAUTION: A neutral to ground connection is provided inside this enclosure. If this neutral-ground connection is provided elsewhere in the AC system, it must be disconnected. See Section 2.9 and Appendix B for information to disconnect this connection.

2.8.2 AC Connections

Figure 2-6 illustrates the connection points for the AC wiring inside the LR-BB enclosure. As depicted, the top section of the LR-BB enclosure contains the wiring necessary to establish connections to the inverter's AC input and output.

The bottom section of the LR-BB enclosure features the AC Hot Input connector, Neutral, and AC Hot Output busbars. These connection points support wiring from an AC source, such as a generator or utility distribution panel (e.g., main panel), to the inverter's input. If needed, a dedicated inverter panel (sub-panel) can be added to optimize the connection between the inverter's output wiring and the AC loads.

2.8.3 AC Wiring Connection Points

Figure 2-6 shows the connection points for the AC wiring inside the LR-BB enclosure.

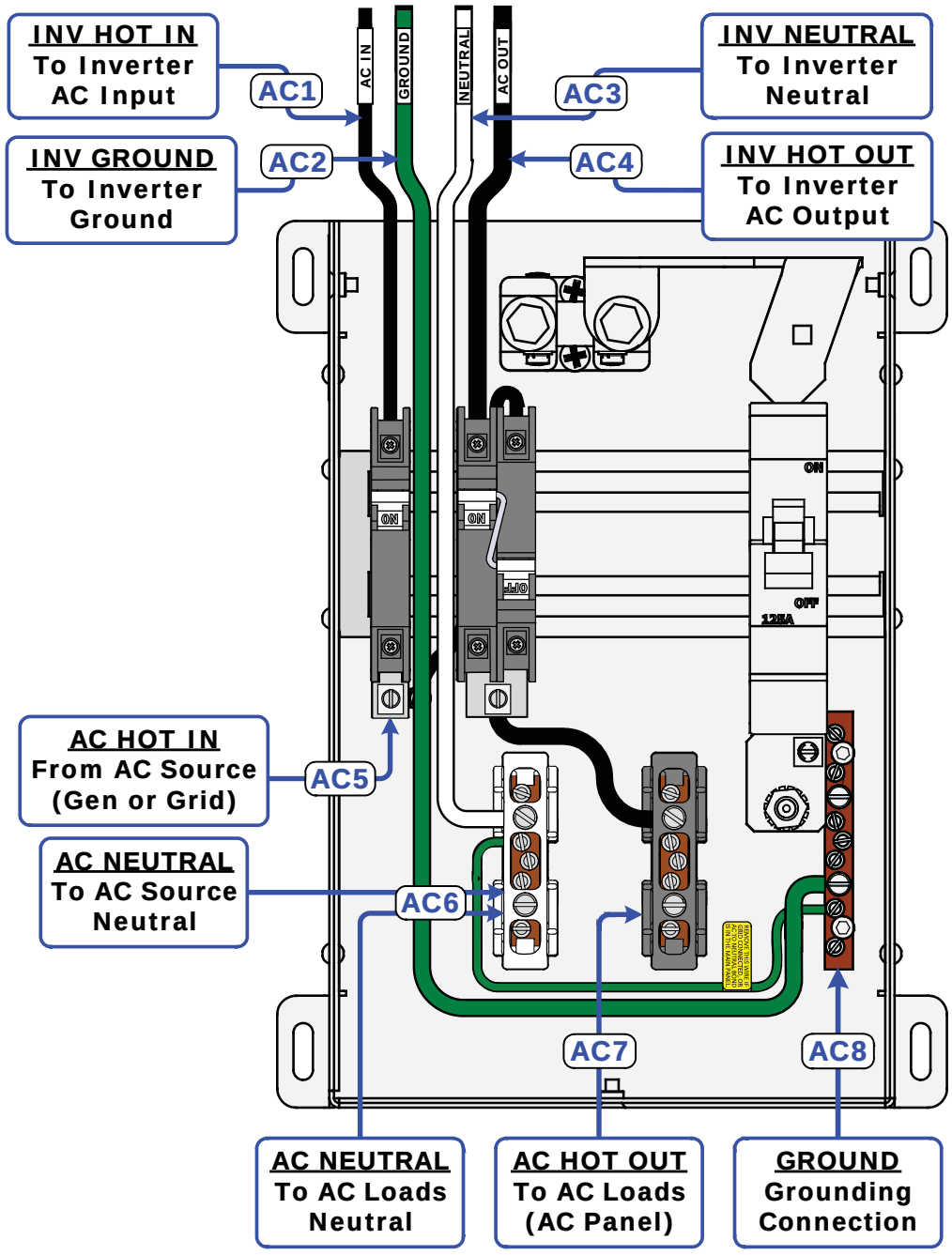

Figure 2-6, AC Wiring Connection Points

AC1	**INV HOT IN** – Connects to the AC Hot In terminal on the Little Rosie inverter.
AC2	**INV GROUND** – Connects to the AC Ground terminal on the Little Rosie inverter.
AC3	**INV NEUTRAL** – Connects to the neutral terminal on the Little Rosie inverter.

Info: The neutral connections on the AC terminal block on the MNLR4548RE are interconnected. You can choose to connect to either the inverter's input neutral or output neutral terminal.

AC4	**INV HOT OUT** – Connects to AC Hot Output terminal on the Little Rosie inverter.
AC5	**AC HOT IN** – This is the AC HOT connection point from the AC Source. This could be from the utility grid or a generator.
AC6	**AC NEUTRAL Busbar** – This busbar provides the connection point for the neutral input from the AC Source, and the neutral output connection to the AC loads powered by the inverter.
AC7	**AC HOT OUT Busbar** – This busbar is the AC HOT output connection point to the inverter's AC loads.

Info: The AC NEUTRAL and AC HOT OUTPUT busbars have two #14 to #1/0 AWG (2.08 to 53.5 mm²).and four #14 to #6 AWG (2.08 to 13.3 mm²) screw type compression terminals. Use Table 2-1 for torque requirements.

AC8	**GROUND Busbar** – This busbar is the equipment ground point for all equipment used in the LR-BB/inverter system. Connects to AC source ground and to the electrical load panel powered by the inverter (AC loads).

Info: The AC GROUND busbar has two #14 to #1/0 AWG (2.08 to 53.5 mm²) and seven #14 to #6 AWG (2.08 to 13.3 mm²) screw type compression terminals. Use Table 2-1 for torque requirements.

2.8.4 AC Wire Size and Overcurrent Protection

AC input and output wiring must comply with local electrical safety code requirements to ensure they can safely handle the inverter's maximum load current. After determining the correct AC wire sizes, they must be protected against short circuits and overloads using an overcurrent protection device (e.g., fuse or circuit breaker) and must include a means for disconnecting the AC circuits.

CAUTION: If you opt to use AC circuit breakers or wire sizes different from those specified below, consult the relevant electrical codes to ensure proper sizing.

2.8.4.1 AC Input Wire Sizing

The LR-BB utilizes a 30-amp breaker to safeguard the 30-amp pass-through relay in the Little Rosie inverter. Additionally, the LR-BB employs a 30-amp breaker for the inverter's bypass. These continuous-duty, branch circuit-rated breakers require a minimum wire size of #10 AWG (5.3 mm²). They function as overcurrent protection devices and AC disconnects, provided the AC input wires are no smaller than #10 AWG (5.3 mm²).

2.8.4.2 AC Output Wire Sizing

When connected to an AC source for charging, the Little Rosie inverter activates its AC load support feature automatically. This enables the inverter's AC output current to exceed the input current supplied by the AC source. The inverter's output can deliver up to 55 amps AC. To accommodate this, the LR-BB uses a 60-amp continuous-duty rated breaker at the AC output, requiring a minimum wire size of #6 AWG (13.3 mm²).

2.8.5 AC Conductor Wiring

The following steps are basic guidelines for installing and connecting the AC wiring into and out of the inverter. Refer to Figure 2-6 to assist in determining where to connect you AC conductors.

WARNING: To prevent electrical shock, ensure the inverter is either turned off or disconnected from the battery. Additionally, verify that all AC power sources—including the inverter, generator, and utility—are completely turned off before making any connections inside the LR-BB enclosure.

Note: If not using conduit, ensure strain reliefs or grommets are used to protect the wiring from damage when it passes into and out of the LR-BB conduit openings.

Wiring to the External AC Source

1. Route an appropriate cable (with hot, neutral, and ground wires) from the AC electrical main panel (AC Source) through an opening on the LR-BB.

   Attach the following wires:

   a) hot wire (BLACK) to the AC HOT IN terminal (Item AC5),

   b) neutral wire (WHITE) to the AC NEUTRAL busbar (Item AC6),

   c) ground wire (GREEN) to the AC GROUND busbar (Item AC8).

Wiring to the AC Load Panel

2. Route an appropriate cable (with hot, neutral, and ground wires) to the AC electrical sub-panel through an opening on the LR-BB.

   Attach the following wires:

   a) hot wire (BLACK) from the AC HOT OUT terminal (Item AC5),

   b) neutral wire (WHITE) from the AC NEUTRAL busbar (Item AC7),

   c) ground wire (GREEN) from the AC GROUND busbar (Item AC8).

Wiring the Inverter AC Input/Output Wires

3. Attach the wires in the LR-BB (AC HOT IN, NEUTRAL, AC HOT OUT, and GROUND) to the Little Rosie's AC terminal block:

   a) AC HOT IN wire (BLACK) to the Inverter's AC HOT IN terminal,

   b) AC NEUTRAL wire (WHITE) to the inverter's NEUTRAL terminal,

   c) AC HOT OUT wire (BLACK) to the Inverter's AC HOT OUT terminal,

   d) GROUND wire (GREEN) to the Inverter's GROUND terminal.

AC Wiring Inspection

4. After ensuring that all AC connections are accurate, properly torqued (refer to Tables 2-1 to 2-4), and the inverter's AC terminal levers are securely clamped, reinstall the inverter's AC wiring access cover along with the covers on the electrical/distribution panels.

2.9 Neutral-Ground Connection

In off-grid configurations, where the LR-BB enclosure serves as the primary grounding point for both AC and DC systems, and no other connections exist between AC neutral or DC negative and ground, the ground-neutral wire in the LR-BB (Item 14, Figure 1-3) must remain intact. Any additional neutral-to-ground links in the AC system, such as those in sub-panels, or negative-to-ground connections in the DC system must be removed.

For utility-connected systems where neutral and ground are already bonded within the main utility circuit breaker box (AC distribution panel), or for systems and devices that independently bond DC negative to ground—such as separate DC electrical distribution panels or PV-GFP devices—the negative-ground wire must be disconnected.

Refer to Appendix B for removal instructions.

2.10 Equipment Grounding Conductor

Inverter power systems must always be connected to a grounded wiring system to reduce the risk of electric shock and minimize radio frequency interference. A properly grounded system ensures that fault currents are safely directed to the ground in the event of an electrical malfunction. All noncurrent-carrying exposed metal surfaces in the LR-BB/inverter system and throughout the entire electrical system that could be accidentally energized must also be grounded.

Inverter power systems are unique because they consist of both AC and DC electrical systems, both of which require proper grounding.

AC Side: When the AC circuit breaker within the LR-BB enclosure is used as the inverter's AC overcurrent protection device, the AC Equipment Grounding Conductor must correspond to the largest AC breaker size installed [#10 AWG (5.3 mm²) for 30-60 amp breakers].

DC Side: When the DC circuit breaker within the LR-BB enclosure is used as the inverter's DC overcurrent protection device, the DC Equipment Grounding Conductor is determined by the size of the DC breaker installed [#6 AWG (13.3 mm²) for a 125-amp breaker].

Table 2-5 below outlines the appropriate equipment-grounding conductor size based on the overcurrent device rating in compliance with the NEC (National Electrical Code):

Table 2-5, Equipment Grounding Conductor Sizing

Rating of Overcurrent Device	Minimum Size of Copper Ground Wire
15 amps	14 AWG (2.1 mm^2)
20 amps	12 AWG (3.3 mm^2)
30 to 60 amps	10 AWG (5.3 mm^2)
100 amps	8 AWG (8.4 mm^2)
200 amps	6 AWG (13.3 mm^2)
300 amps	4 AWG (21.1 mm^2)
400 amps	3 AWG (26.7 mm^2)

CAUTION: The grounding conductor wiring must remain continuous to allow fault currents to operate overcurrent devices effectively. If equipment removal interrupts the bonding connection between the grounding electrode conductor and exposed conductive surfaces, a bonding jumper must be installed during the equipment's absence.

2.11 Functional Test

Once all electrical connections from the LR-BB enclosure to the inverter, batteries, AC source, and sub-panel have been completed, follow these steps (refer to Figures 2-7 and 2-8) to test the LR-BB enclosure installation and verify the proper operation of the BYPASS switch breakers.

WARNING: During this functional test, the front cover is removed, exposing personnel to shock hazards inside the LR-BB. These hazards can cause severe damage, injury, or death. If you lack experience working with AC and DC voltage circuits, do not attempt this test—seek the assistance of a qualified electrical installer.

CAUTION: If any step cannot be verified or is incorrect during this functional test, stop immediately to recheck and correct the connections before proceeding further.

1. Turn **OFF** all breakers in the LR-BB enclosure (i.e., **AC IN**, **INV OUT**, and **BATTERY**).
2. Use a DC voltmeter and place the negative (-) probe on the side of the DC shunt; then place the positive (+) probe at the bottom of the **BATTERY** breaker (see Figure 2-7). Verify the battery voltage is positive and within the range of 45 to 55 VDC.
3. If both battery voltage and polarity are verified as correct, apply battery power to the inverter by turning the inverter **BATTERY** breaker to the ON (up) position.
4. Press and release the inverter's ON/OFF power switch—located on the front of the inverter—to turn the inverter on. Verify that the inverter's INV (green) LED status indicator comes ON.
5. Check the AC output voltage of the inverter by connecting an AC voltmeter to the top of the **INV OUT** breaker and the NEUTRAL busbar (see Figure 2-8). Verify the voltage is 120 VAC ±2.5 VAC.
6. If the AC voltage is correct, turn on the **INV OUT** breaker to power a load and verify it comes on. Continue to keep the load connected and turned on.
7. Apply 120VAC from an external AC source (utility or AC generator) to the **AC IN** breaker and the NEUTRAL busbar. Verify that the inverter's CHG (yellow) LED status indicator comes ON, and the AC load continues to be powered.
8. Turn OFF the **INV OUT** breaker (which turns ON the **BYPASS** breaker) and ensure the AC load continues to be powered.

If all steps are completed successfully, disconnect all AC and DC power, replace the front cover, and test each circuit breaker for proper alignment and operation.

If any step fails, review the Installation section to check wiring or consult the Troubleshooting section for your inverter.

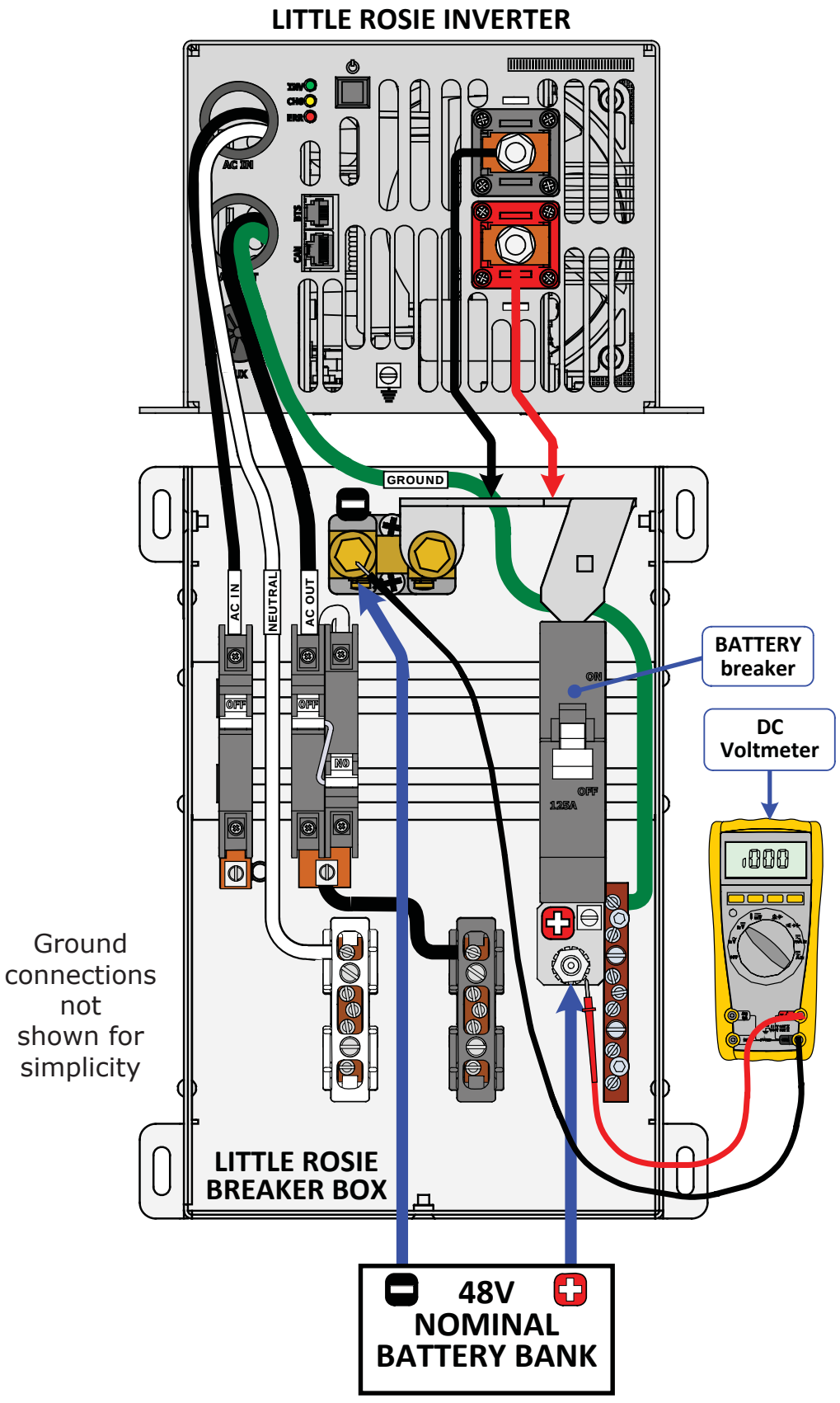

Figure 2-7, DC Voltage Check

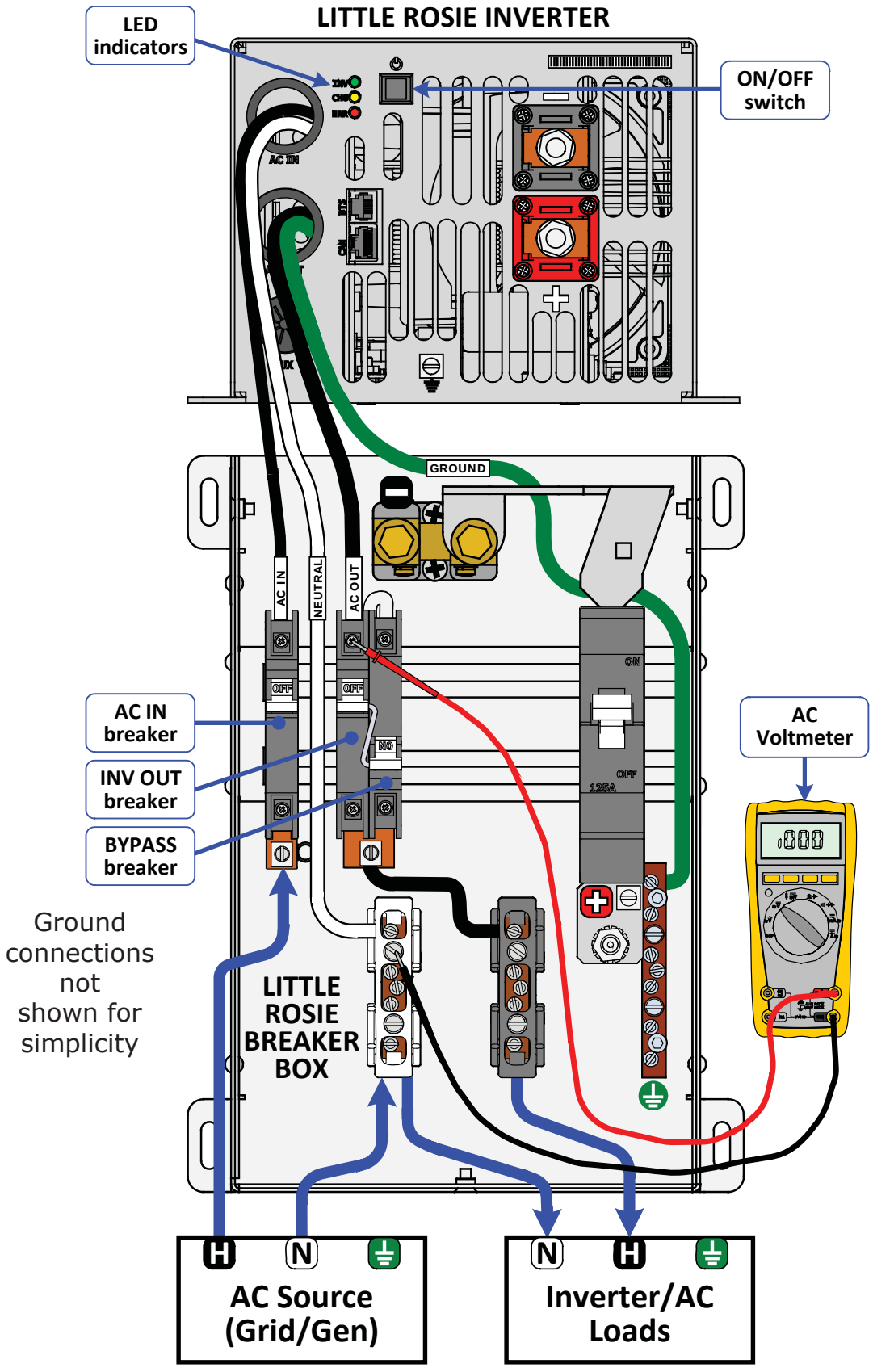

Figure 2-8, AC Voltage Check

3.0 Operation

The Little Rosie Breaker Box is equipped with circuit breakers for efficient operation and maintenance of your inverter/battery system. These breakers serve as the main power disconnection mechanism and provide overcurrent protection.

Info: For instructions on operating the inverter, refer to the owner's manual.

In the event of a short circuit or excessive load exceeding the breaker's capacity, the breaker will trip OFF (down). Before resetting, identify and address the cause of the overcurrent fault. To reset, turn the breaker fully OFF and then ON again. For longevity, cycle the breakers ON and OFF several times annually to prevent the contacts from sticking.

3.1 BATTERY Breaker

The 125-amp DC battery breaker disconnects the battery during battery maintenance. This breaker is also used to protect the inverter and—depending on your electrical code—can also be used to protect the battery cables from over-loads or short circuits.

WARNING: Do not use the battery breaker routinely to power the inverter on/off, it is there to provide safety and ease of maintenance. Use the inverter's on/off switch. However, in an emergency, the battery breaker can be used to shut off the inverter while it is operating.

3.2 AC IN Breaker

This single-pole 30-amp breaker connects the incoming AC source (utility or generator) to the inverter's AC input when turned ON. Turn it OFF to disconnect the external AC source.

3.3 INV OUT Breaker

The single-pole 60-amp INV OUT breaker connects the inverter's AC output to the AC loads when ON. When this breaker is turned OFF, it turns the Bypass breaker ON to connect the pass-thru power (from the utility or generator) around the inverter to the AC loads.

Note: The AC Load Support feature of the Little Rosie inverter enables it to supplement its AC output with additional current, surpassing the input current supplied by the AC source. As a result, the inverter's output can reach up to 55 amps AC. To support this functionality, the INV OUT breaker is sized at 60 amps.

3.4 BYPASS Breaker

The 30-amp single-pole BYPASS breaker is wired in the LR-BB between the incoming AC source and the inverter AC load panel (i.e., sub-panel). When turned ON, it bypasses the inverter, supplying AC loads directly from the external AC source.

Note: This BYPASS breaker uses a mechanical interlock with the INV OUT breaker to prevent both breakers from being ON at the same time.

Typically, the BYPASS breaker remains set to OFF (inverter not bypassed) but can be switched to ON (bypass inverter) as needed. This allows AC loads to remain powered during inverter or battery bank maintenance without requiring rewiring. Refer to Figure 3-1 to visualize current flow during BYPASS breaker operation.

Info: When the BYPASS breaker is ON, connected equipment is only powered by the external AC source (utility or generator). If the external AC source is disconnected or turned off, the connected equipment will lose power.

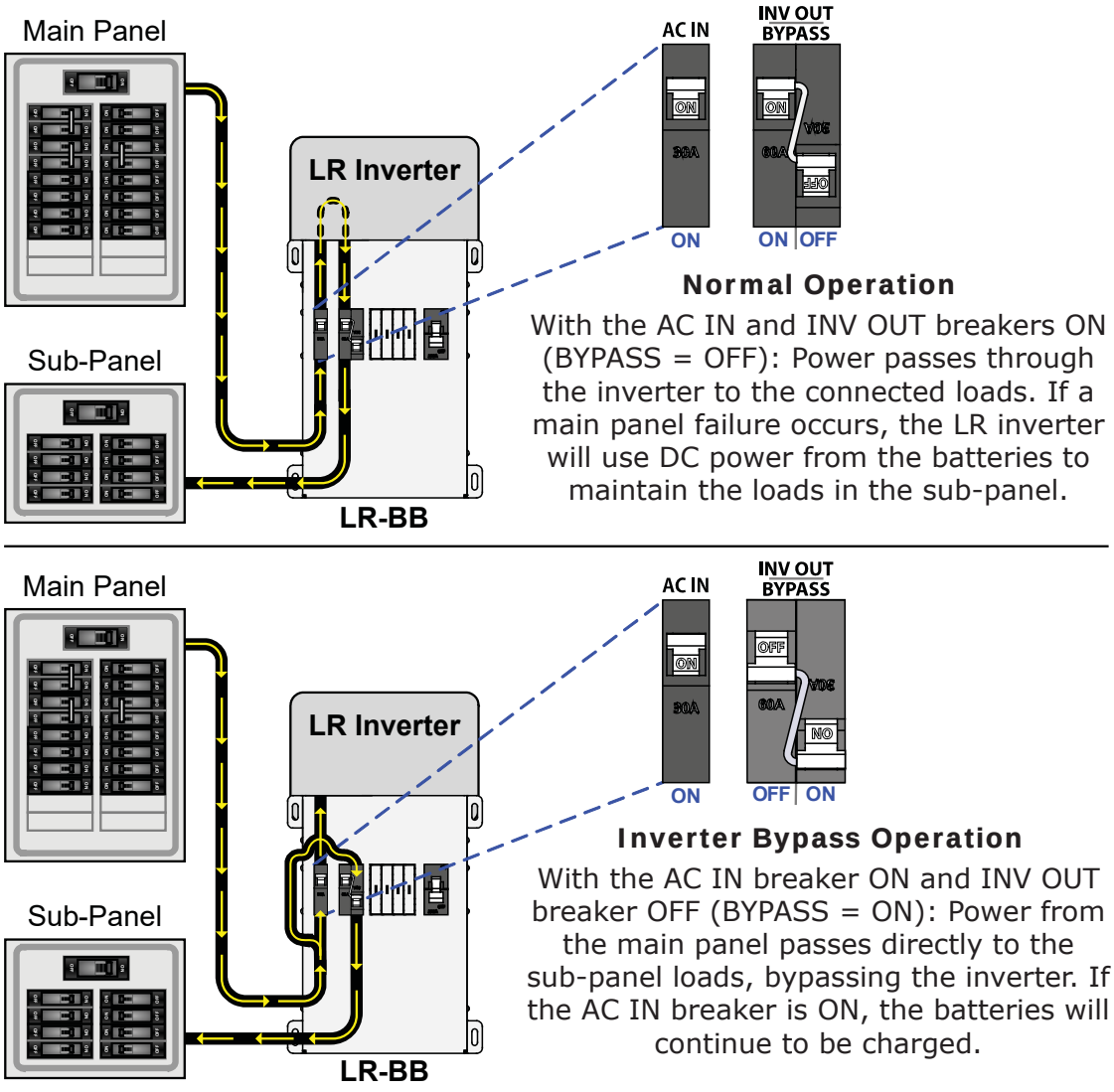

Figure 3-1, BYPASS Breaker Operation

Appendix A – Optional Equipment & Accessories

The following components are available for use with the Little Rosie System (inverter/charger and breaker box). Some of these items are required depending upon the intended use of the inverter.

MNWBJR (WhizBang Junior)

The Whiz Bang Jr is a current-sensing device designed to attach to the side of the 200A/20mV shunt within the LR-BB. By combining the shunt with the Whiz Bang Jr, you can monitor the flow of current entering or leaving the battery bank. This data enables precise calculation of the battery bank's State of Charge (SOC) percentage.

Info: To setup and program the Whizbang Jr with the Little Rosie Inverter, you need the MNGP2 remote control.

MNGP2 (Graphics and Programming Remote Control)

The MNGP2 graphics and programming remote allows communication, monitoring and programming of the Little Rosie. The rotary dial provides easy access to all menus and devices on the network as well as the selection of custom programming within the various sub-menus.

Surge Protection Devices

MidNite Solar's Surge Protector Devices (SPD) are Type 1 devices designed for both indoor and outdoor applications. There are four different models available, catering to both AC and DC systems and various voltage levels. These SPDs offer protection to service panels, load centers, or any location where direct connection to an electronic device requiring protection is necessary. Their primary function is to clamp surge voltage to a level that your system can sustain without causing damage to its components.

AC and DC Circuit Breakers

Midnite sells many different types of AC and DC circuit breakers, available in various voltages and amperages.

Most of the DC Breakers have the following features:

- High energy DC circuit breakers
- Ultra compact - single-pole is 1/2" (13 mm) wide, two-pole breaker width 1 in (26mm)
- Hydraulic-magnetic technology
- Can be switched on immediately after tripping
- ON and OFF indication
- Suitable for electrical isolation
- 100% rating capability, independent of ambient temperature
- Box type main terminals
- Listed for US & Canada

A.1 Installing a MNWBJR (WhizBang Junior)

Use Figure A-1 below to install the WhizBang Jr into the LR-BB:

Item List	
Item	**Description**
A1	Bolt, 5/16-18 X 5/8
A2	Lock Washer, 5-16
A3	Flat Washer, 5-16
A4	Shunt (200A/20MV)
A5	Washer Lock, No.8,
A6	Screw, 8-32 X 5-8
B	Battery Negative Busbar
C1	Spacer, AL .25 X .25 X .166
C2	WhizBang Jr
C3	Spacer, AL .25 X .125 X .171
A =	Part of Shunt Assembly (included in LR-BB)
B =	Part of LR-BB (Little Rosie Breaker Box)
C =	Part of WhizBang Jr. Assembly

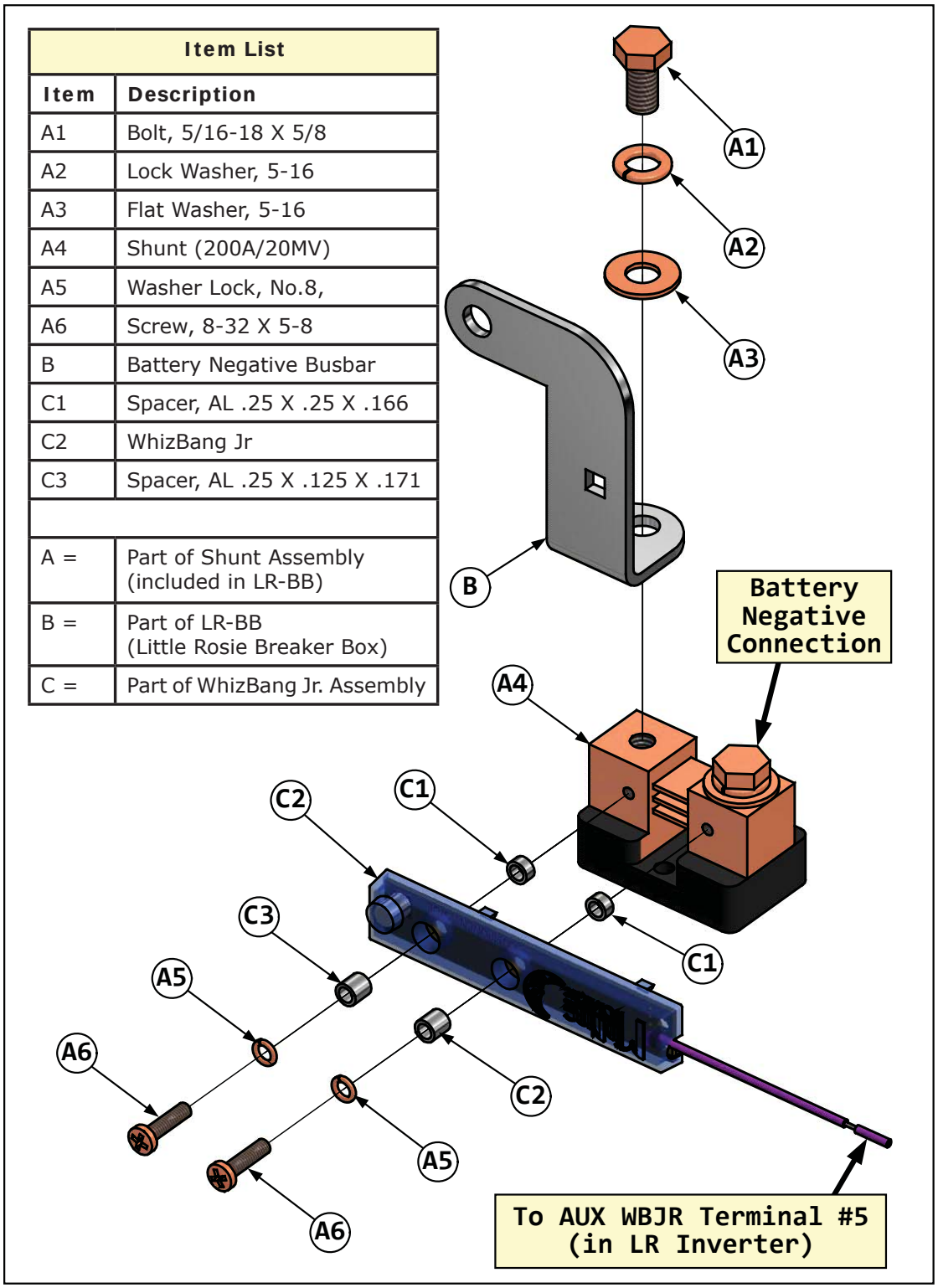

Figure A-1, Installing the WhizBang Jr.

A.2 Installing Optional Breakers

The LR-BB enclosure provides installation space for up to four ½" (12.7mm) wide DIN rail-mounted breakers, suitable for AC load breakers (e.g., refrigerators, lights, etc.), DC load breakers, or PV system components like disconnects and Ground Fault Protection.

Info: Even though each slot is 1/2" wide; multiple slots can be removed for breakers wider than 1/2" (up to 2" total).

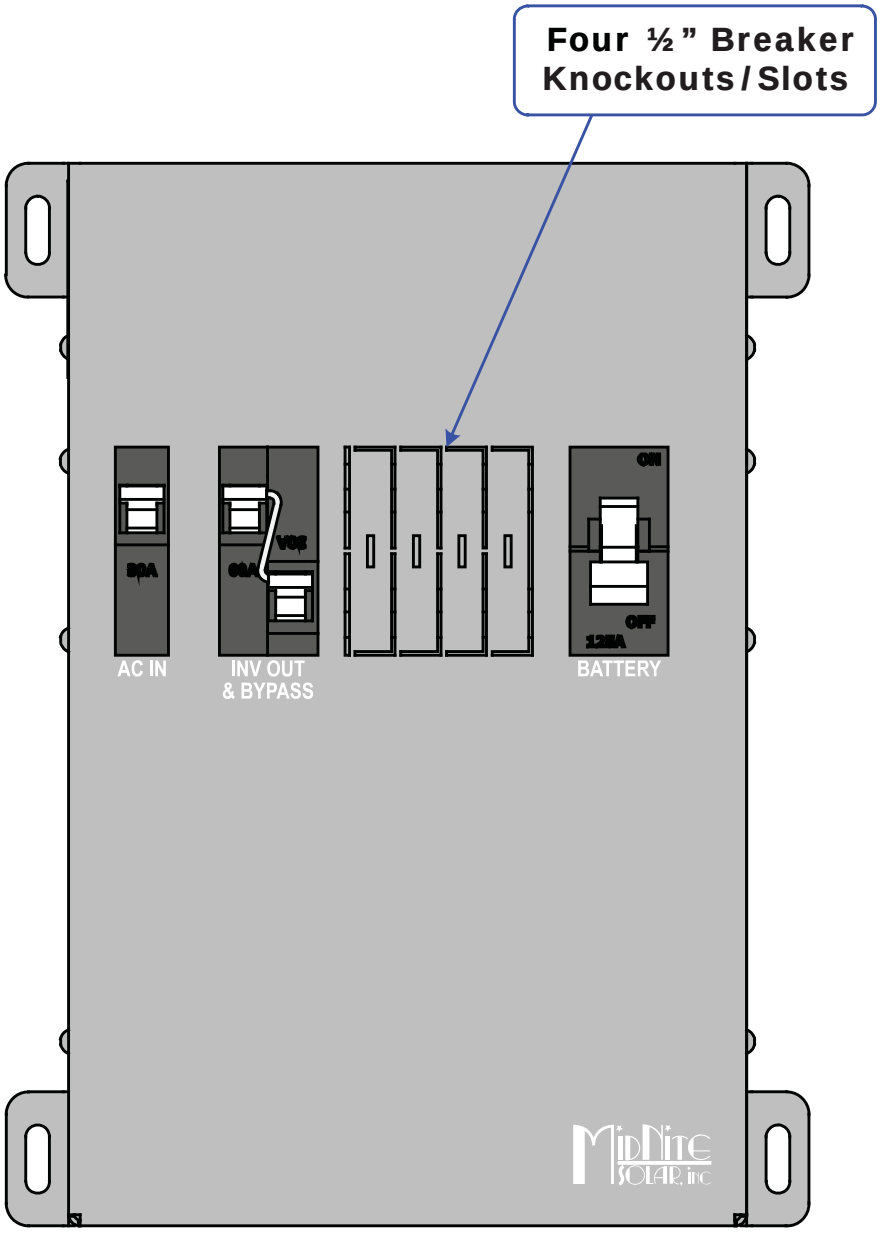

Figure A-2, Knockouts/Slots for Additional Breakers

Appendix B – Neutral to Ground Connection

B.1 Removing the Neutral to Ground Connection

In installations where the Little Rosie Inverter and LR-BB enclosure are powered from utility power or in a large permanently installed generator system, the AC neutral to ground connection is normally provided inside the main AC electrical distribution panel. In these systems, the factory installed neutral to ground connection in the LR-BB enclosure must be removed to prevent multiple neutral to ground bonds.

Removing the neutral to ground wire/connection:

Inside the LR-BB enclosure, locate the green wire with the yellow NEUTRAL-GROUND CONNECTION label as shown in Figure B-1. This green wire connects the neutral and ground inside the LR-BB enclosure.

Loosen the screw and remove this green wire from both the Neutral Busbar and the Ground Busbar.

***Note**: After this wire is removed, remember to tighten the loose screws back into the busbars to prevent it from being lost.*

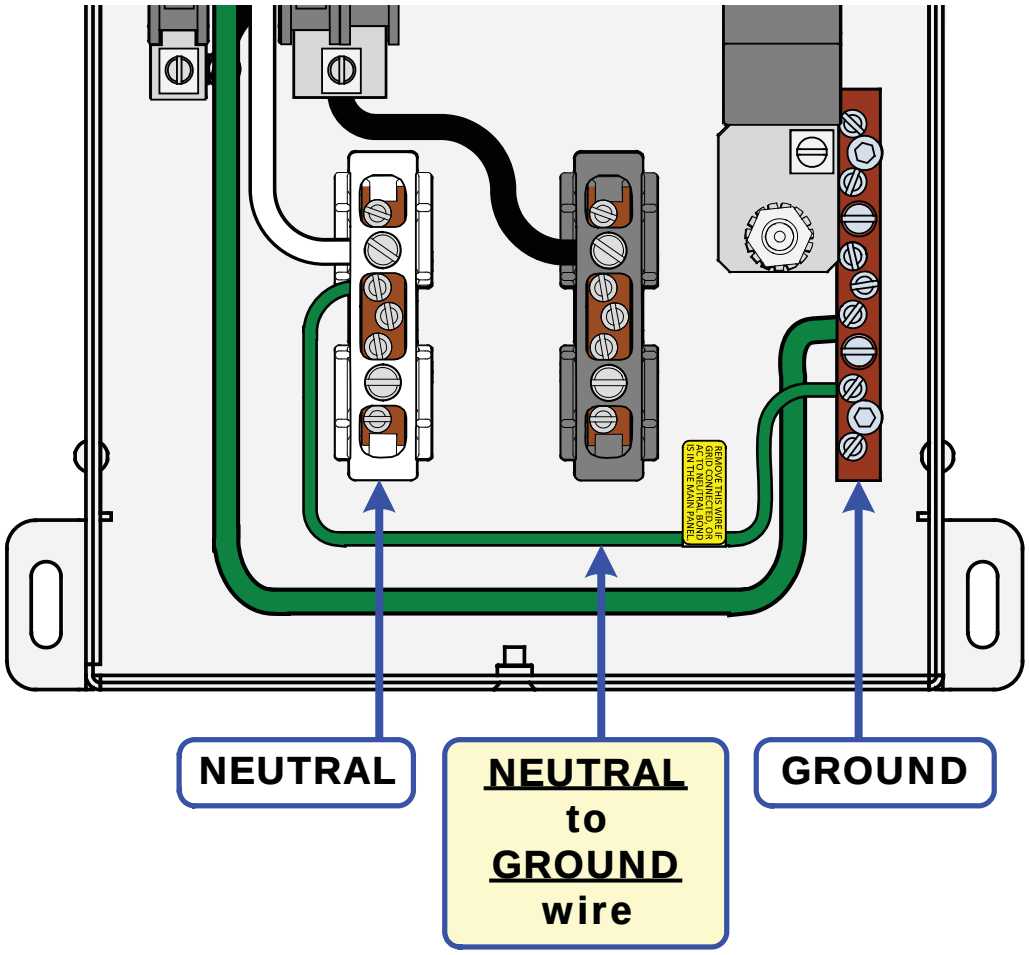

Figure B-1, Locating/Removing Neutral-Ground Connection

Appendix C – Warranty/Service Information

C.1 Warranty Information

MidNite Solar warrants to the original customer that the MNE125LR-120S Breaker Box shall be free from defects in materials and workmanship. This warranty will be valid for a period of five (5) years.

MidNite Solar will not warranty third party inverter components used in MidNite's systems. Those components are warranted by the original manufacturer.

At its option, MidNite Solar will repair or replace at no charge any MidNite product that proves to be defective within such warranty period. This warranty shall not apply if the MidNite Solar product has been damaged by unreasonable use, accident, negligence, service, or modification by anyone other than MidNite Solar, or by any other causes unrelated to materials and workmanship. The original consumer purchaser must retain original purchase receipt for proof of purchase as a condition precedent to warranty coverage. To receive in-warranty service, the defective product must be received no later than two (2) weeks after the end of the warranty period. The product must be accompanied by proof of purchase and Return Material Authorization (RMA) number issued by MidNite Solar. For an RMA number contact MidNite Solar Inc., (360) 403-7207. Purchasers must prepay all delivery costs or shipping charges to return any defective MidNite Solar product under this warranty policy. Except for the warranty that the products are made in accordance with, the specifications therefore supplied or agreed to by the customer:

MIDNITE SOLAR MAKES NO WARRANTY EXPRESSED OR IMPLIED, AND ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE FOREGOING WARRANTY IS HEREBY DISCLAIMED BY MIDNITE SOLAR AND EXCLUDED FROM ANY AGREEMENT MADE BY ACCEPTANCE OF ANY ORDER PURSUANT TO THIS QUOTATION. MIDNITE SOLAR WILL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES, LOSS OR EXPENSE ARISING IN CONNECTION WITH THE USE OF OR THE INABILITY TO USE ITS GOODS FOR ANY PURPOSE WHATSOEVER. MIDNITE SOLAR'S MAXIMUM LIABILITY SHALL NOT IN ANY CASE EXCEED THE CONTRACT PRICE FOR THE GOODS CLAIMED TO BE DEFECTIVE OR UNSUITABLE.

Products will be considered accepted by customer unless written notice to the contrary is given to MidNite Solar within ten (10) days of such delivery to customer. MidNite Solar is not responsible for loss or damage to products owned by customer and located on MidNite Solar's premises caused by fire or other casualties beyond MidNite Solar's control. This warranty is in lieu of all other warranties expressed or implied.

A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER IS REQUIRED BEFORE RETURNING ANY PRODUCT

C.2 How to Receive Repair Service

If your product requires warranty service or repair, contact MidNite Solar at:

Technical/General Support

- Phone: 360.403.7207 Ext. 232, or
- Email: support@midnitesolar.com

If returning your product directly to MidNite Solar for repair, you must:

1. Return the unit in the original, or equivalent, shipping container
2. Receive a Return Materials Authorization (RMA) number from the factory prior to the return of the product to MidNite for repair.
3. Place RMA numbers clearly on the shipping container or on the packing slip.

When sending your product for service, please ensure it is properly packaged. **Damage due to inadequate packaging is not covered under warranty.** We recommend sending the product by traceable and insured service.

MNE125LR-120S Owner's Manual

by:

MidNite Solar

Web: www.MidNiteSolar.com