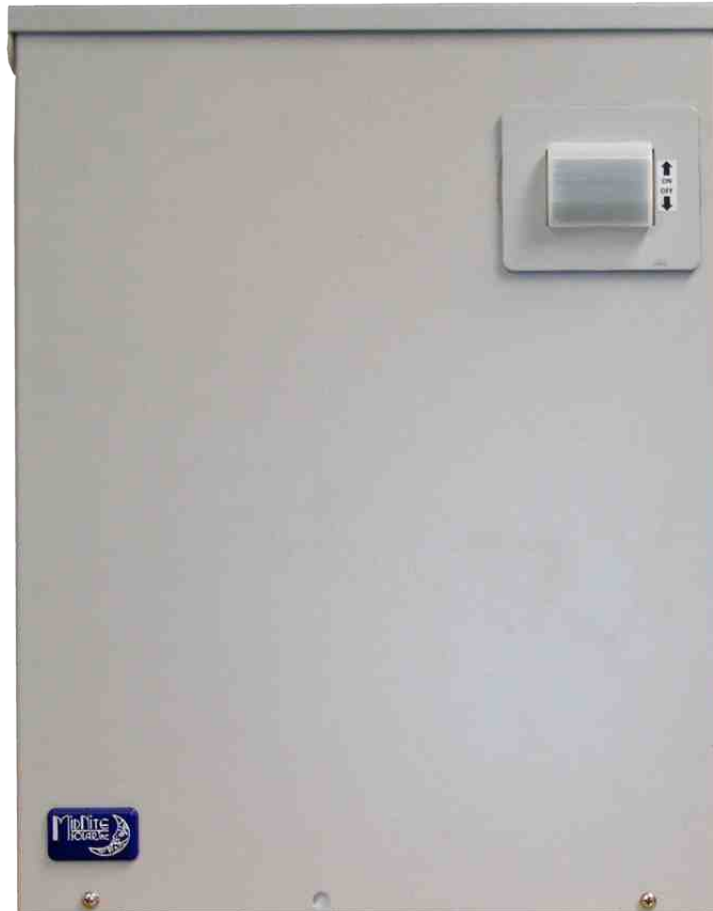




# MNLBC \ MNLBC-W250 Instruction Manual



## MidNite Solar Battery Combiner

- Combines up to 14 battery strings (MNLBC). 10 strings (MNLBC-W250).
- Maximum 80 Volts.
- 250 Amp output breaker (MNLBC-W250).
- 3/4" knockouts.
- 2 Output Studs 5/16" each.
- Type 3R rainproof enclosure.
- 5 year warranty.

MidNite Solar  
17722 - 67th Ave NE  
Arlington, Wa 98223  
[www.midnitesolar.com](http://www.midnitesolar.com)



# MNLBC /MNLBC-W250 Instructions

## IMPORTANT SAFETY INSTRUCTIONS

**SAVE THESE INSTRUCTIONS** - THESE INSTRUCTIONS CONTAIN IMPORTANT SAFETY AND OPERATING INSTRUCTIONS FOR THE MNLBC and MNLBC-W250 Battery Combiners.

If you do not fully understand any of the concepts, terminology, or hazards outlined in these instructions, please refer installation to a qualified dealer, electrician or installer. These instructions are not meant to be a complete explanation of a renewable energy system. All installations must comply with national and local electrical codes. Professional installation is recommended.

### GENERAL PRECAUTIONS:

WORKING WITH OR IN THE VICINITY OF A LEAD ACID BATTERY, SEALED OR VENTED IS DANGEROUS. VENTED BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. FOR THIS REASON, IT IS VERY IMPORTANT THAT BEFORE SERVICING EQUIPMENT IN THE VICINITY OF LEAD-ACID BATTERIES YOU REVIEW AND FOLLOW THESE INSTRUCTIONS CAREFULLY.

If service or repair should become necessary, contact MidNite Solar Inc. Improper servicing may result in a risk of shock, fire or explosion. To reduce these risks, disconnect all wiring before attempting any maintenance or cleaning. Turning off the inverter will not reduce these risks. Solar modules produce power when exposed to light. When it is not possible to disconnect the power coming from the Photovoltaics by an external means such as a combiner, cover the modules with an opaque material before servicing any connected equipment.

Do Not expose to rain or snow. NEVER attempt to charge a frozen battery. Do not smoke around batteries.

When it is necessary to remove a battery, make sure that the battery bank disconnect breaker is in the off position and that the PV breakers, grid breakers and any other sources of power to the inverter are in the off position. Then **remove the negative terminal from the battery first**.

To reduce risk of battery explosion follow these instructions and those published by the battery manufacturer as well as the manufacturer of any additional equipment used in the vicinity of the batteries.

Avoid producing sparks in the vicinity of the batteries when using vented batteries. Provide ventilation to clear the area of explosive gases. Sealed AGM and Gel batteries do not under normal conditions create explosive gases. Refer to the battery manufacturer's documentation. Be especially cautious when using metal tools. Dropping a metal tool onto batteries can short circuit them. The resulting spark can lead to personal injury or damage to the equipment. Provide ventilation to outdoors from the battery compartment when installing vented batteries such as golf cart T-105 batteries. The addition of a spill tray is also a good idea.

Clean all battery terminals. Very high currents are drawn from the batteries; even a small amount of electrical resistance can result in overheating, poor performance, premature failure or even fire.

Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. Wear complete eye and clothing protection. Always avoid touching eyes while working near batteries. If battery acid or battery terminal corrosion contacts skin or clothing, wash immediately with soap and water. If acid enters the eyes, immediately flood with cool running water for at least 15 minutes and get medical attention immediately. Baking soda neutralizes battery acid electrolyte. Keep a supply near the batteries

Do not work alone. Someone should be in the range of your voice or close enough to come to your aid when you work with or near electrical equipment. Remove rings, bracelets, necklaces, watches etc. when working with batteries, photovoltaic modules or other electrical equipment. Power from an illuminated photovoltaic array makes a very effective arc welder with dire consequences if one of the welded pieces is on your person.

To reduce the risk of injury, connect only deep cycle lead acid type rechargeable batteries. Other types of batteries may leak or burst, causing personal injury or damage.

Wiring methods used shall be in accordance with the Canadian Electrical Code, Part I.

Wiring must be done in accordance with the National Electrical Code Article 690 ANSI/NFPA 70. Select the wire gauge used based on the protection provided by the circuit breakers/fuses. Overcurrent protection must be installed as part of the system installation. Refer to the wiring diagrams provided in this manual for breaker/fuse/GFDI sizes and model numbers.

It is the installer's responsibility to ensure compliance with NEC and all applicable code requirements.

Use of attachments or accessories not approved by MidNite Solar could result in damage or injury.

Before making any connections verify that the circuit breakers are in the off position including the inverter breaker. Double check all wiring before applying power.



# INSTRUCTIONS DE SÉCURITÉ IMPORTANTES

**CONSERVER CES INSTRUCTIONS** - CES INSTRUCTIONS CONTIENNENT DES INFORMATIONS IMPORTANTES POUR UTILISER LE MIDNITE SOLAR MNLBC ET MNLBC-W250 COMBINEURS LES ACCUS. EN TOUTE SÉCURITÉ.

Avant l'utilisez cet appareil lis et comprends toutes les instructions et avertissements.

Si vous ne comprenez pas l'une des concepts ou des instructions contenu dans cette manuel consulter un agent spécialisé.

Si des réparations sont nécessaires contactez MidNite Solar pour plus des informations. Danger de choc électrique et de risque de brulure. Rien à dépanner à l'intérieure du cette appareil. Ne pas ouvrir le couver. Pour toute réparation ou service d'entretien, consulter un agent spécialisé. Il y'a peut-être plusieurs sources d'alimentation dans cette system. Débrancher toutes les interrupteurs avant toute d'entretien où nettoyage.

Ne travaillez pas seul. Quelqu'un devrait toujours être à proximité pour aider en cas d'une situation d'urgence.

Retirer bagues, bracelets, colliers, montres, et quelles choses comme ça. Il y'a risque des blessures graves s'il y'a un court-circuit. Cela pourrait ruiner votre journée entière.

Le câblage doit être fait en conformité avec le National Electrical Code Article 690 ANSI / NFPA 70. Utiliser des méthodes de câblage de catégorie 1 pour les connexions de câblage sur .des terminaux d'un circuit de classe 2. Utilisez uniquement des fils de AWM de calibre 14-1/0. Sélectionnez le type de câble utilisé sur la base de la protection prévue par les disjoncteurs / fusibles. Il incombe à l'installateur de se conformer à NEC et à toutes les exigences du code en vigueur.



## Table of Contents

|                          |    |
|--------------------------|----|
| Warnings.....            | 2  |
| Revision History.....    | 4  |
| Product Description..... | 4  |
| Installation.....        | 5  |
| Inputs and Outputs.....  | 5  |
| Wiring MNLBC-W250.....   | 7  |
| Wiring MNLBC.....        | 8  |
| MNLBC Dimensions.....    | 9  |
| Warranty.....            | 10 |

### Product Description

The MNLBC Battery Combiner is designed to be a safe, tidy, convenient, and rainproof means of tying together up to 14 battery strings.

Positive and negative wires from each string enter the combiner and a single larger combined negative and combined positive exit the combiner going to the loads.

An external overcurrent / disconnect means must be provided for each battery string.  
Overcurrent protection is required on the output (provided on the MNLBC-W250).

For conduit hubs, use only UL Listed raintight, or wet location hubs for entry into the enclosure.

### Symbols used in this manual



Ground Symbol  
Indicates an earth ground connection.



# MNLBC /MNLBC-W250 Instructions

## Installation

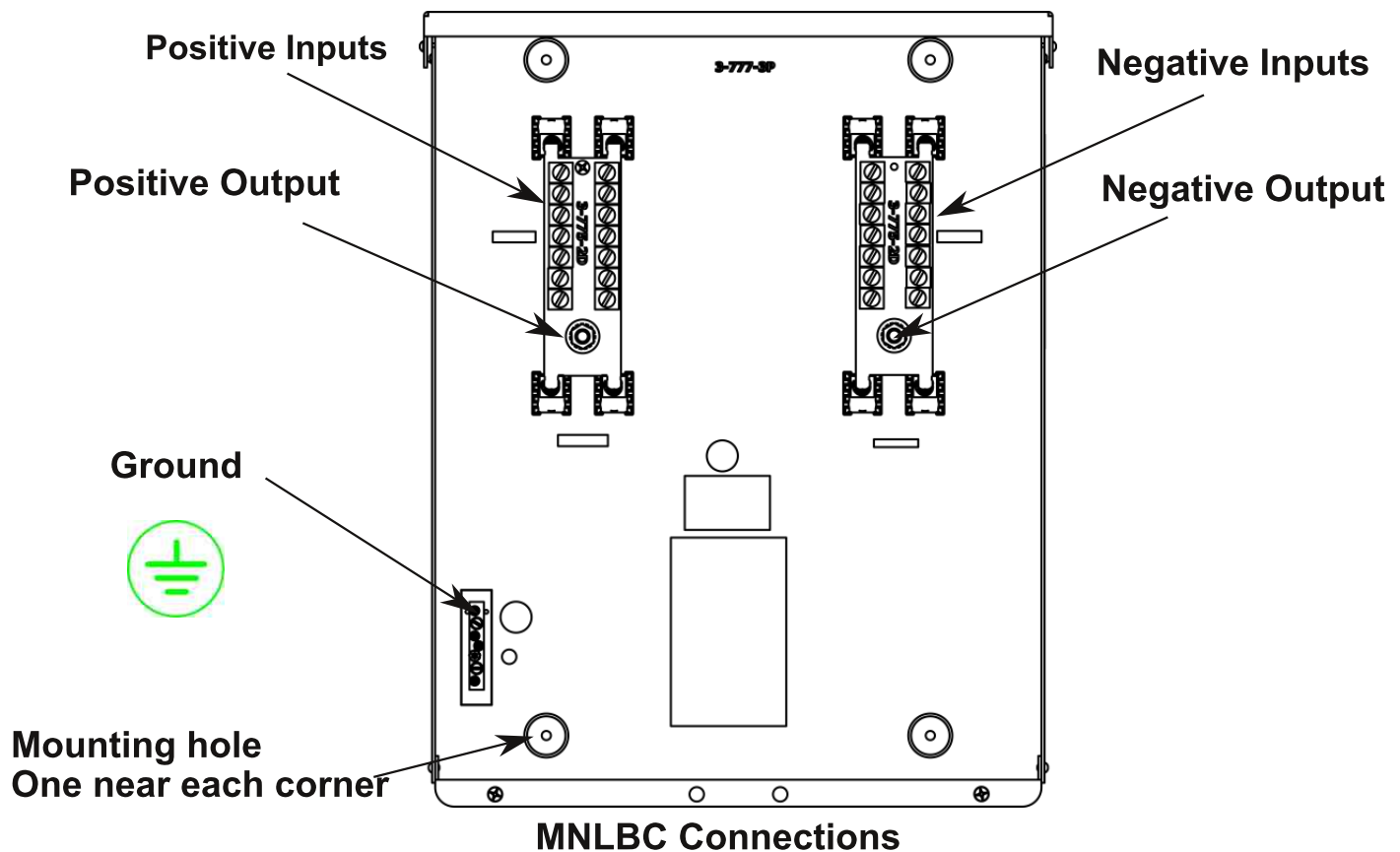
First, select a location near the battery strings to be combined. It is important to keep battery cables as short as possible. Mount the MNLBC at least three feet above the floor.

The MNLBC / MNLBC-W250 Combiners have a type 3R enclosure. Rainproof but not water-tight.

When using flooded batteries it is important to provide good ventilation. Build up of hydrogen produced by the batteries may create an explosion hazard. Opening and closing of circuit breakers may produce a spark. This must be considered when designing the system.

To mount the combiner to the wall, first remove the cover. Inside you will find four mounting holes near the corners.

Use #10 screws long enough to properly support the combiner. The use of wall anchors may be required.



### To remove the cover:

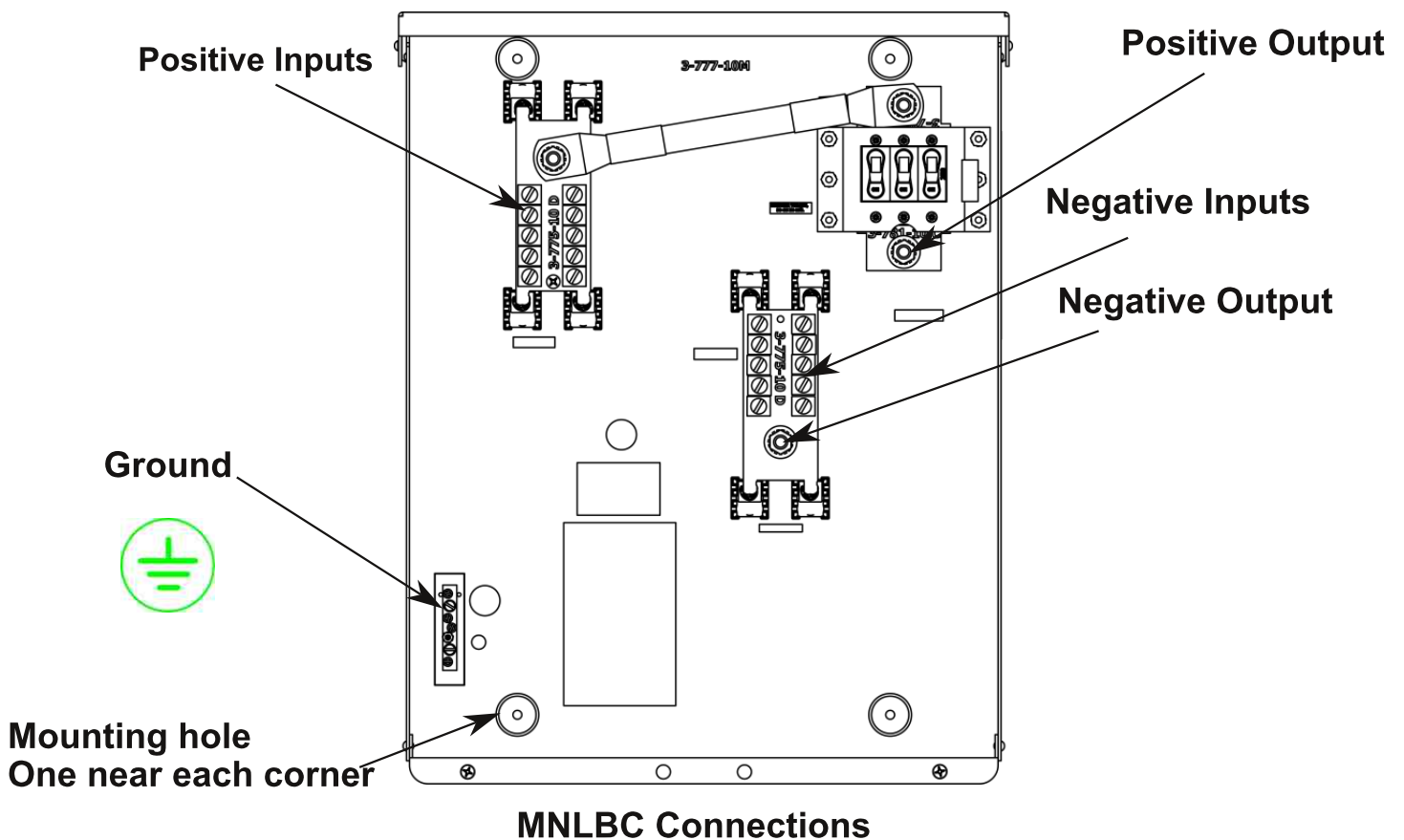
Pry off the lid as shown using something like a screwdriver as a lever.



# MNLBC /MNLBC-W250 Instructions

## Installation continued:

The MNLBC and MNLBC-W250 mount in the same fashion.  
Below are the connections for the MNLBC-W250



### To remove the cover:

Pry off the lid as shown using something like a screwdriver as a lever.



# MNLBC /MNLBC-W250 Instructions

## Wiring

Wiring the MNLBC-W250 is very straightforward. Connect negatives from the battery strings to be combined to the negative input busbar and the positives to the positive input busbar. A chassis ground busbar is provided for grounding the unit.

The negative output is available at the bottom of the negative output busbar.  
The positive output is available at the busbar at bottom of the circuit breaker.

**Important!** Only combine battery strings of the same type and voltage.  
Overcurrent protection and disconnects must be provided for all battery strings and the combined output.

All cables should be the same length. A system with 10 strings would have 20 cables all the same length.

### RATINGS:

MAX CONTINUOUS CURRENT: 250 AMPS DC

MAX VOLTAGE 80 VDC

TEMPERATURE RANGE -40°C TO +40°C

### TERMINAL BLOCK TORQUE:

SMALL BUS SCREWS 14-10 AWG 20 IN-LBS

SMALL BUS SCREWS 8 AWG 25 IN-LBS

SMALL BUS SCREWS 6 AWG 35 IN-LBS

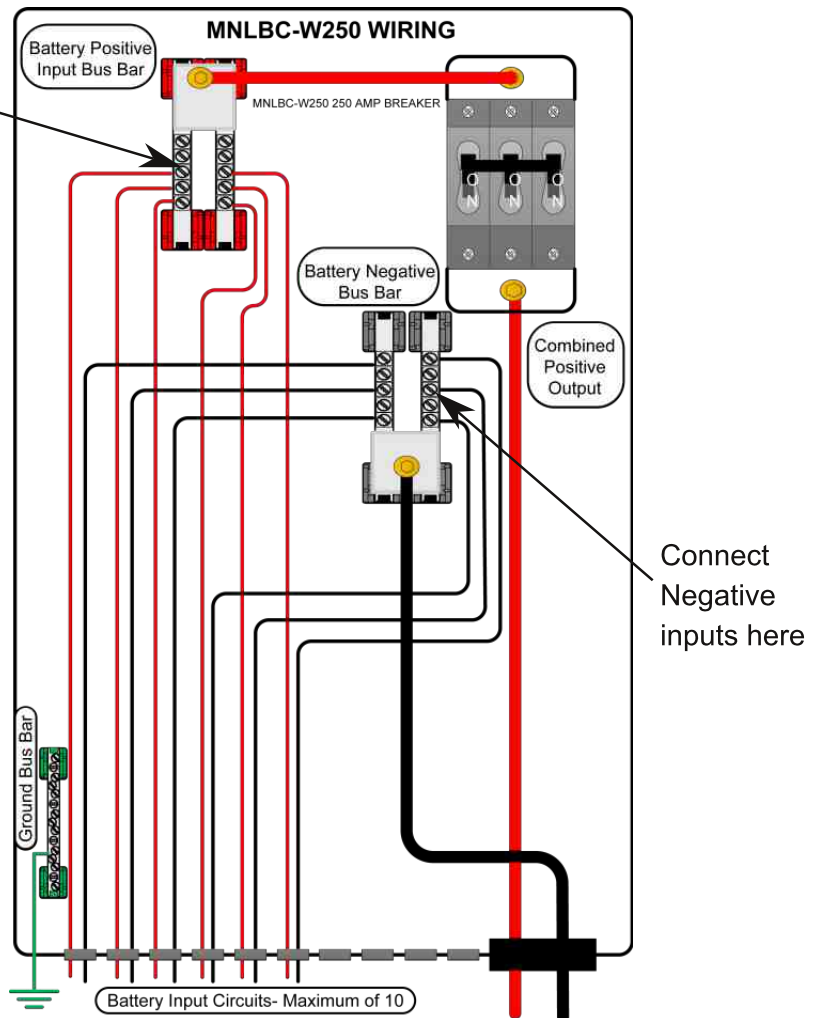
LARGE BUS SCREWS 14-10 AWG 35IN-LBS

LARGE BUS SCREWS 8 AWG 40 IN-LBS

LARGE BUS SCREWS 6-4 AWG 45 IN-LBS

LARGE BUS SCREWS 3-1/0 AWG 50IN-LBS

Connect  
POSITIVE  
inputs here



### OUTPUT LUGS:

4/0 220 IN-LBS (24.9nm)

Combined Output

Negative ground system.

Ungrounded connections require overcurrent protection.





# MNLBC /MNLBC-W250 Instructions

## Wiring

Wiring the MNLBC is very straightforward. Connect negatives from the battery strings to be combined to the negative input busbar and the positives to the positive input busbar. A chassis ground busbar is provided for grounding the unit.

The negative output is available at the bottom of the negative output busbar.

The positive output is available at the bottom of the Positive output busbar.

**Important!** Only combine battery strings of the same type and voltage.

Overcurrent protection and disconnects must be provided for all battery strings and the combined output.

All cables should be the same length. A system with 14 strings would have 28 cables all the same length.

### RATINGS:

MAX CONTINUOUS CURRENT: 250 AMPS DC

MAX VOLTAGE 80 VDC

TEMPERATURE RANGE -40°C TO +40°C

### TERMINAL BLOCK TORQUE:

SMALL BUS SCREWS 14-10 AWG 20 IN-LBS

SMALL BUS SCREWS 8 AWG 25 IN-LBS

SMALL BUS SCREWS 6 AWG 35 IN-LBS

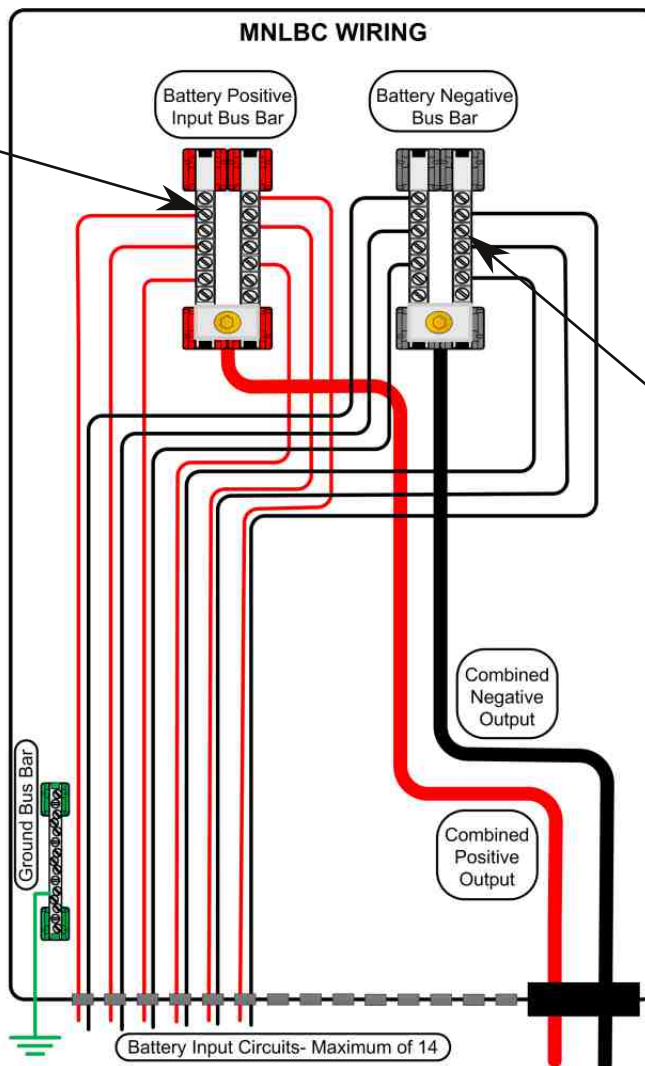
LARGE BUS SCREWS 14-10 AWG 35 IN-LBS

LARGE BUS SCREWS 8 AWG 40 IN-LBS

LARGE BUS SCREWS 6-4 AWG 45 IN-LBS

LARGE BUS SCREWS 3-1/0 AWG 50 IN-LBS

Connect  
POSITIVE  
inputs here



Connect  
NEGATIVE  
inputs here

Combined Output

Negative ground system.

Ungrounded connections require overcurrent protection.

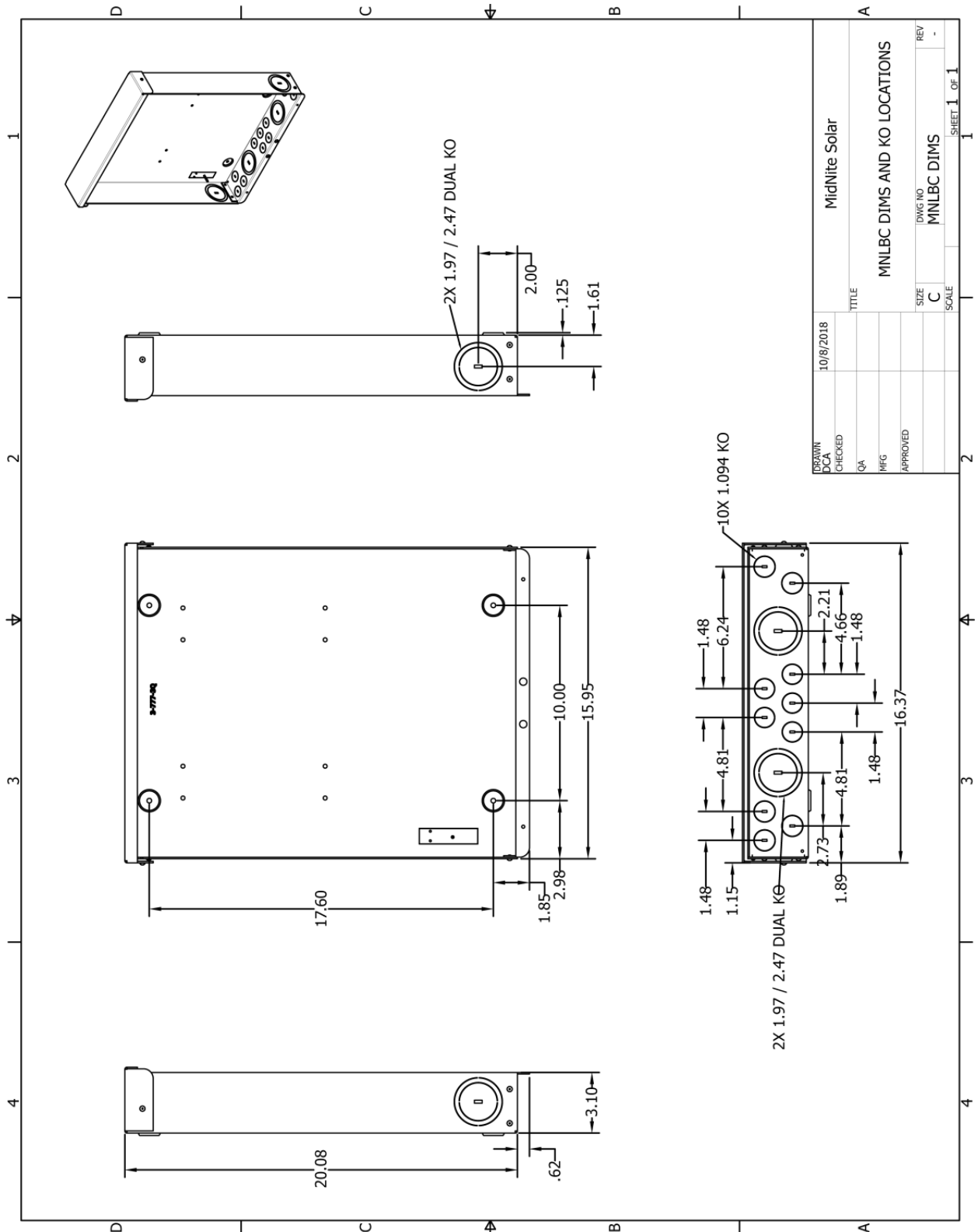
### OUTPUT LUGS

2/0, 3/0, & 4/0 220 IN-LBS (24.9nm)





# MNLBC /MNLBC-W250 Instructions





## MNLBC /MNLBC-W250 Instructions

### MIDNITE SOLAR INC. LIMITED WARRANTY

#### MidNite Solar Power electronics, sheet metal enclosures and accessories

##### MIDNITE SOLAR INC. LIMITED WARRANTY

MidNite Solar Power electronics, sheet metal enclosures and accessories

MidNite Solar Inc. warrants to the original customer that its products shall be free from defects in materials and workmanship. This warranty will be valid for a period of five (5) years for all products except the MNBRAAT Charge Controller along with the MNBIRDHOUSE1 batteries, these will be two (2) years. MidNite Solar will not warranty third party inverter components used in MidNites pre-wired 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 Authorization (RA) number issued by MidNite Solar. For an RMA number contact MidNite Solar Inc., 17722 67th Ave NE, Arlington, WA 98223 (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 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.

MIDNITE SOLAR INC. 17722 67TH AVE NE ARLINGTON, WA 98223

Email:

info@midnitesolar.com

PH: 360-403-7207 FAX: 360-691-6862