



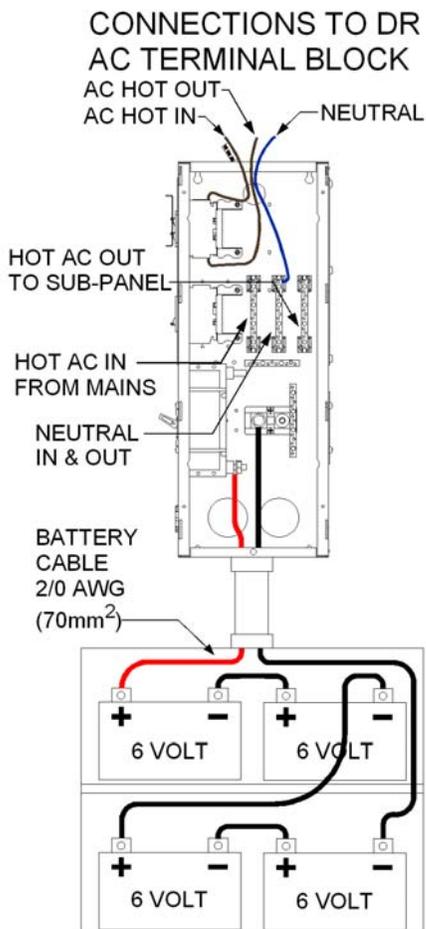
14000 Burn Rd  
Arlington, WA 98223  
USA  
Ph (425)374-9060  
www.midnitesolar.com

## DR/TR E-Panel Instructions



The MidNite DR/TR E-Panel assembled minus the inverter.

Note: The DR E-Panel for South Africa may not have all of the covers shown.



The MidNite Solar DR/TR E-Panel meets all wiring requirements of the United States National Electrical Code as well as Canadian standard CAN/CSA C22.2 No14-M95 and Underwriters Laboratories requirements in UL508A. Other standards may apply.

These installation instructions are suitable for installing a Xantrex or Trace Dr or TR inverter/charger. There may also be other inverter/chargers that utilize the same physical dimensions and hook up patterns.

Model numbers covered:  
MNE125DR/TR-L  
MNE175DR/TR-L  
MNE250DR/TR-L

The MidNite Solar MNBE-A battery enclosure is depicted for reference in these instructions.

A 24 volt battery bank configuration is depicted here although 12V and 48V are easily configured in the same enclosure.

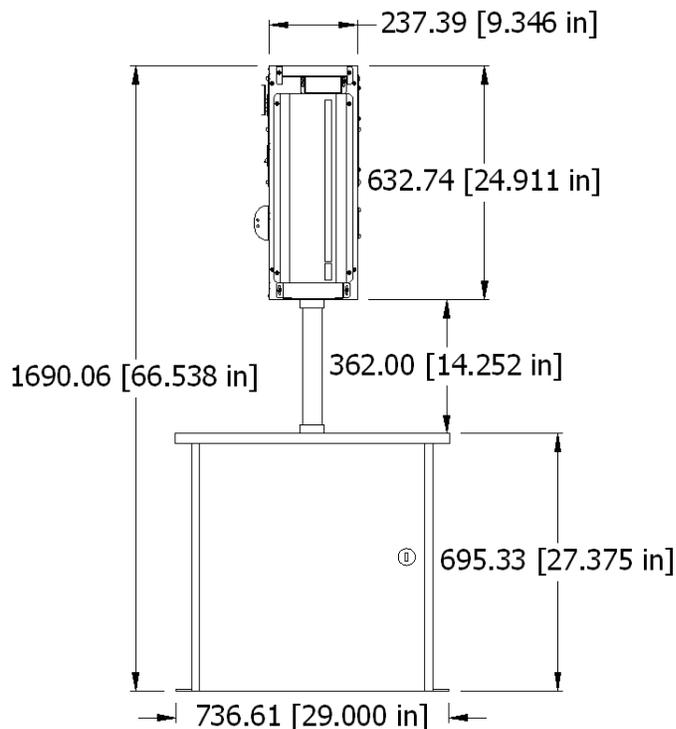
24 VDC BATTERY CONFIGURATION

## Manual Title Here (continued)

The MidNite Solar DR/TR E-Panel comes standard with the basic over-current protection and disconnects required to install your renewable energy system. It can also expand to grow as your needs arise.

List of features:

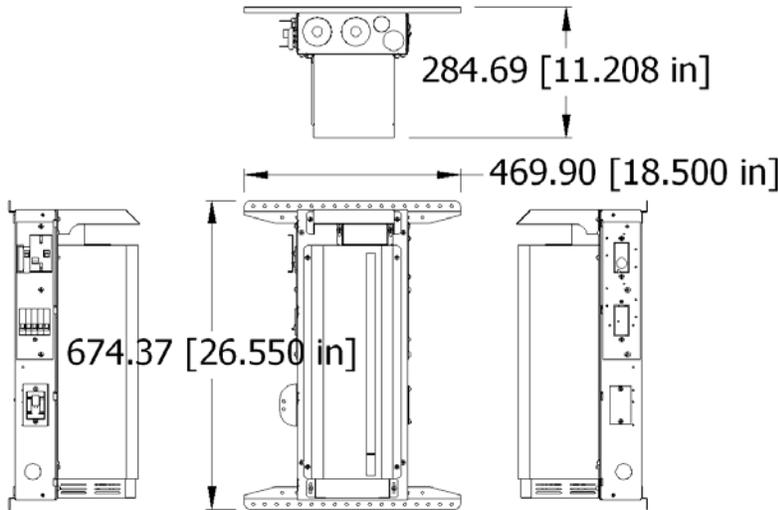
- Steel chassis with all the required openings and knock outs to aid in a NEC compliant system installation.
- Inverter mounts on a unique hinged door to keep the foot print of the system small as possible
- Mounting brackets are included to aid in one person installations
- Inverter battery breaker, inverters cables and snap in grommets included
- 500 amp / 50mv shunt included for battery monitoring systems
- Bus bars are included for additional battery plus and minus circuits
- Heavy duty 175 amp AC power distribution blocks included
- 50 amp (30 amp on 230VAC units) AC input disconnect for generator or utility included, pre-wired
- 50 amp (30 amp on 230VAC units) AC bypass switch bypassing the inverter for maintenance
- Mounting bracket to aid in mounting an OutBack MX60 or MidNite Classic to the side of the E-Panel (not included on South Africa power back up systems).
- Battery cable cover to enclose cables external to the chassis. (not included on South Africa power back up systems)
- Inverter and charge controller mounting hardware
- One rectangular cut out for mounting a North American GFCI style AC outlet
- Knock outs for mounting up to six additional 13mm wide din rail mount breakers for additional circuits such as PV, wind, hydro or AC distribution
- Three side knock outs for ¾" wide panel mount "C" frame breakers
- ETL listed to UL and CSA standards



The drawing to the left shows dimensions (mm & inches) of the MidNite DR/TR system. The US National Electrical Code requires 30" horizontal space within to fit the E-Panel on the wall. There can be no other objects within the 30 inches. The NEC also requires a minimum of 36 inches free and clear directly in front of the E-Panel.

Wall mounting brackets are provided to aid in mounting the E-Panel (not shown).

# Manual Title Here (continued)



The drawing to the left shows dimensions (mm & inches) of the E-Panel and Dr inverter with wall mounting brackets installed.

Mount the E-Panel on the wall using the dimensions shown and adjusted for your particular application. Do not have the door or inverter installed at this time.



For a professional looking job, make sure you use a level and tape measure to get things square and level.

The installation begins by selecting a wall. This wall must have suitable clearance to open the door with inverter attached. It must also have adequate clearance to operate the breakers and outlets that protrude out the sides. Each E-Panel system will weigh close to 80 pounds so make sure your wall is adequate for this load. The mounting brackets provided will span studs on 16 inch centers. Mount the top bracket as shown at about 66.5 inches off the floor. If stacking two systems vertically, make sure the breakers fall within the NEC guidelines for height, (lowest and highest allowable). Number 10 screws with back up washers will suffice, but 1/4" (6mm) hardware provides for a better margin of safety. Systems that utilize a battery enclosure directly below the E-Panel must have the battery enclosure and connecting conduit in place before setting the E-Panel onto the conduit.

You can make life a little easier by installing additional breakers for charge control, the inverter and such while the E-Panel is still lying horizontal on a table. Do as much of the additional wiring as possible before hanging the E-Panel on the wall. The following pictures show some of the operations that can be done "on the bench" where access is optimal. It is very helpful to pre-assemble the charge controller and associated breakers as well as lightning arrestors where applicable.

Knock outs can be done first



Install the lower wall bracket

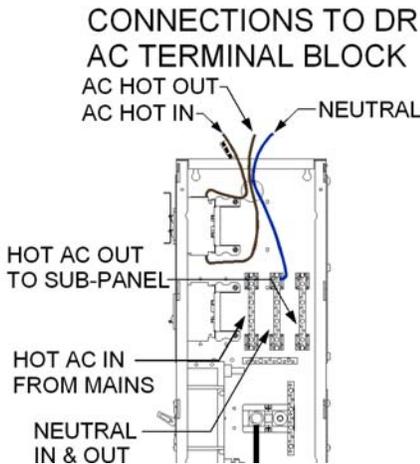


Pre-tapping inverter holes in door. Use four 10-32 (5mm) thread forming screws and four star washers to secure the inverter to the door



Installing the inverter to the door while still horizontal.

# Manual Title Here (continued)



The pictures above show AC connections to the DR terminal block.

This E-Panel is a 230 Volt unit made for Africa and has wires colored for that country. North America uses black instead of brown and white instead of blue. The Hot AC in wire comes labeled as such and connects to the DR's AC terminal second from the left as shown above. Neutral connects to either one of the terminals marked for Neutral in or out. They are common inside the DR/TR. Connect up the Hot AC out wire to the right hand terminal inside the DR/TR as shown. Make sure the snap in grommet is already in place before connecting wires to the DR/TR AC terminal block.

Install the AC compartment cover using two 10-32 x 5/16" taptite screws as shown to the right. Note that the lower AC cover from the DR/TR has been removed and discarded.

If the E-Panel was supplied with the top shield as shown below, secure it to the door using two 10-32 x 5/16" taptite screws.



## Manual Title Here (continued)

---



Connect up the DC inverter cables as shown to the left. Take special care to avoid hitting the ground terminal on the back of the DR/TR as it may cut through the inverter cable insulation. Make sure to install the snap in grommets prior to installing the inverter DC cables. Torque the DC terminals per the inverter specifications.



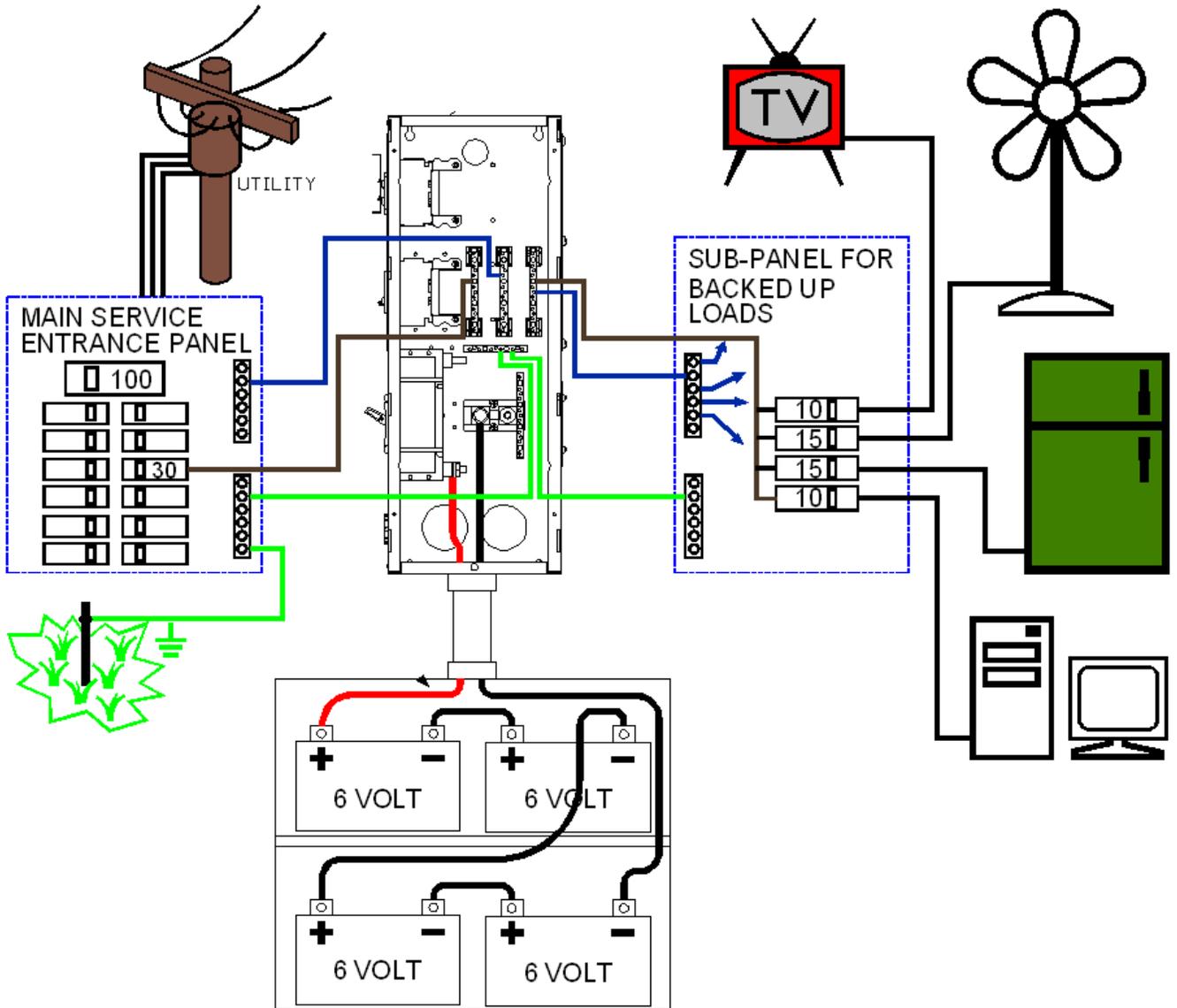
If the E-Panel kit was supplied with a DC end cover, install it using two 10-32 x 5/16" taptite screws.



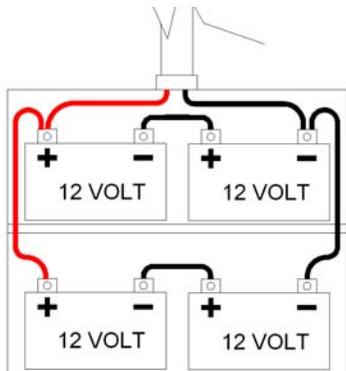
E-Panel with inverter and all covers

After the E-Panel is mounted to the wall, hook up the house AC wiring using the three AC terminal bus bars inside the E-Panel. The AC hot in bus bar in a power back up system is wired to the main utility disconnect panel through the appropriate breaker. 30 amps for 230VAC units and 60 amps for North American 120VAC units. In an off-grid installation, The Hot AC in busbar connects to the hot output of a generator. The neutral connection comes from the main utility disconnect box in a power back up system and from the generator in an off-grid installation. The Hot AC out bus bar connects to a sub panel breaker box that feeds the backed up loads in both power back up and off-grid applications. See the pictorial diagram on the following page for an idea of a 230VAC 50Hz. power back up system.

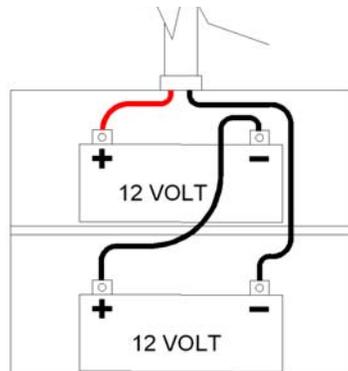
Off-grid looks the same as power back up except the utility is replaced with an AC generator. An off-grid system will use a larger battery bank depending on the anticipated loads usage. It may also include Solar, Wind or Hydro systems for battery charging.



24 VDC BATTERY CONFIGURATION



24 VDC BATTERY CONFIGURATION



24 VDC BATTERY CONFIGURATION

Shown here are three different methods to create a 24 volt battery bank in the MidNite Solar MNBE-A enclosure.

The top picture uses 6 volt golf cart batteries.

The left bottom picture uses group 31 12V batteries.

The bottom right uses 8D or truck batteries.