

MidNite Solar E-Panels Explained revised 3-08

When the pre-wired MidNite E-Panels first came out late in 2005, the choices were easy. You were limited to an OutBack inverter and all you had to do was to pick the correct breaker size. Well we've managed to accommodate many dealer and installer requests, but along with these enhancements come additional choices. To help lead you in the right direction, we'll cover different inverters and explore the many options available within each platform.



This is the basic E-Panel made for all of the OutBack FX & VFX inverters. The enclosure is only 9.5 inches wide and 25 inches tall.

The main features are it's small size and low cost.

The main drawback is also the small size. The picture here doesn't show it, but the insides have undergone a radical change in the form of individual AC busbars rather than the single AC block. This change allows up to 14 connections per circuit rather than only 5. This enclosure is available as a right hand hinged unit or left (door swing and breakers for a left version are opposite from the right hand version shown)

Another configuration to this series is the availability of an aluminum enclosure vs. the standard steel unit. Steel units are powder coated gray and the aluminum is white. The white aluminum E-Panels are used in places like Hawaii or Maine or wherever salt air is a factor. Aluminum E-Panels also weigh 9 pounds less than the gray steel versions. Some customers just like the look of white, and order aluminum just for that reason.

These E-Panels comes standard with the AC bypass and AC input disconnect pre-wired, din rails for 6 additional 13mm wide AC or DC breakers, battery breaker installed with inverter plus and minus cables, 500 amp/50mV shunt, battery plus busbar, battery minus busbar, AC busbars, ground busbar, DC cover, AC flex conduit tubing with couplers, MX60/Classic mounting bracket, grommets and bushings, numerous knock outs for cable entry and exit, lots of hardware for mounting inverter, charge controller etc, wall mounting brackets, installation instructions, wiring diagram mounted on the door, and a tech support phone number. Check out the before and after pictures below. This person couldn't afford the regular OutBack breaker boxes, so just did without until MidNite came along. These pictures are what it is all about!



User installed system

E-Panel professionally installed by Ralph O'Donnal of GSW Systems



Model numbers and descriptions for regular FX & VFX OutBack E-Panels:

MNE125ST-L	125 amp breaker in the gray steel chassis, left hand hinge & breakers
MNE175ST-L	175 amp breaker in the gray steel chassis, left hand hinge & breakers
MNE250ST-L	250 amp breaker in the gray steel chassis, left hand hinge & breakers
MNE125AL-L	125 amp breaker in white alum chassis, left hand hinge & breakers
MNE175AL-L	175 amp breaker in the white aluminum chassis, left hand hinge and breakers
MNE250AL-L	250 amp breaker in the white aluminum chassis, left hand hinge and breakers

Change the -L to -R" at the end of the model number to signify right hand hinge. (example: MNE175AL-R). Note that all E-Panels can be swapped from a left hand unit to a right hand unit in the field. This requires a \$59.00 steel or a \$65.00 aluminum left hand door and a couple hours of work. It is easier to have it built as a right hand unit at the factory where there is no additional charge for a right hand door. Note: As of Nov 20, 2007, Left hand hinges are the standard. To receive a right hand hinge, specify as such. Many new MPPT charge controllers need Left hinges for mounting.

Prices: Basic gray steel 175/250 amp retails for \$479, white aluminum 175/250 amp runs \$519, Basic gray steel 125amp \$439, white alum125 amp \$479

Stretched OutBack E-Panel for GFX, GVFX, FX, VFX

Some installers that use a lot of E-Panels have asked for additional room inside the E-Panel. We created the Stretched OB version for these professionals. It is based on the 50% wider Magnum Energy chassis. In addition to more room to work, you also get a PV input busbar, Battery Plus and DC negative busbar. No need for ring terminals anymore with this system! There are also additional knockouts top and bottom for lightning arrestors and cabling. Professionals feel the additional \$70 list price is well worth it.

The PV plus busbar is extremely handy when installing a lightning arrestor to the PV input. That placement is possibly the most important spot for a lightning arrestor. Other DC boxes such as Flexware do not accommodate this connection. The PV busbar also makes it easy to bring in up to 1/0 wires and then reduce to 6AWG to feed the 63 amp disconnect breaker. The DC busbar is also very useful for all DC connections like charge control disconnect output, battery status monitor hook up, and a bus to feed DC load breakers.



Model numbers:
 MNE175STS-R
 MNE250STS-R
 MNE175STS-L
 MNE250STS-L
 Retail \$549



MNE125STS-R
 MNE125STS-L
 Retail \$494



Retail price \$69.00.

The Stretched OutBack E-Panel shown here on the left has the OB surge arrester installed on the top end of the inverter. The OutBack Surge arrester is a UL requirement for grid tie installations. Note that is Surge Arrester does not fit on the narrow OutBack E-Panel, so select a stretched E-Panel when using the OutBack Surge Arrester. Note: Delta surge arrestors fit on all E-Panels.

When using the Apollo T80, OutBack MF80, or MidNite Classic MPPT controller, be sure to order the Left hand unit. The Apollo and Classic have their heatsink on the right side of the unit and the MF80 has no knock out on the right side so the Left E-Panel is the correct choice. All E-Panels are now shipping with a side plate opposite the breaker side that has knock outs to accommodate 80 amp panel mount breakers. 80 amp breakers are sufficient for the T80 because ours are a hydraulic/magnetic design. That means you are allowed per the NEC to actually run 80 amps through the breaker. MNEDC80 breakers are \$20 each. Our Apollo kit includes two 80 amp breakers and a special side plate for retrofitting any gray 120VAC gray E-Panel.

The all aluminum E-Panel on the right has the charge controller mounted on the door with the inverter. This makes for a pretty compact design. We call this E-Panel the "Plus" (LH only)

MNE125AL-L Plus \$574.00
 MNE175AL-L Plus \$629.00
 MNE250AL-L Plus \$629.00

The Magnum Energy 120VAC E-Panel for MS and RD series

Magnum Energy makes a very interesting line of inverters, both modified and pure sine wave. The RE industry is embracing both types of inverters so MidNite builds E-Panels to accommodate all of the RD and MS series. The insides of the Magnum 120VAC E-Panels look much like the Stretched OutBack. Internal AC wires are routed to match the Magnum inverter rather than OutBack. The accessory components like the DC cover, top shield, remote bracket and such are specific to the Magnum E-Panels. Like the Stretched OB E-Panel, the Magnum has a PV input plus and DC plus busbar as well as the regular AC input and output busbars. This chassis is 14.4 inches wide, so has ample room for all your wiring needs. The chassis is only 3.5" deep so wiring access is the best in the industry. All of the present 12 and 24 volt Magnum inverters have a 120VAC inverter/charger input/output as well as a 120VAC input/output that does not go through the electronics. It is strictly a pass through for the other leg of a 240VAC input. The pass through leg can be useful when attempting to utilize both legs of a 240VAC generator. One leg is used for charging and the other is used to pass through to your 240VAC deep well pump. The 120VAC E-Panel here is not able to handle the extra leg of AC, so look to the 240 E-Panel to accommodate this unique feature. Normal installations jumper AC 1&2 on the inverter for 50 amp service at 120VAC.



Gray steel chassis
 Model numbers
 MNE175STM-R
 MNE250STM-R
 MNE175STM-L
 MNE250STM-L

Price \$549

White aluminum
 Model Numbers
 MNE175ALM-L
 MNE250ALM-L

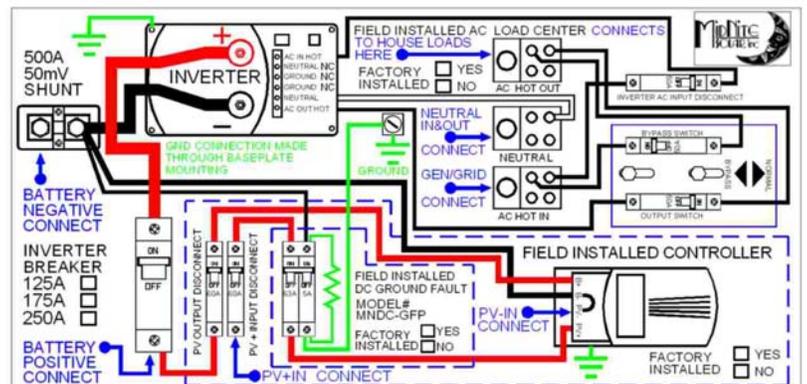
Price \$629



Magnum all wired up and tested with lightning arrestors, charge control disconnects, charge controller and remote display ready for transport to the job site. A DC-GFP and battery status monitor could also have been added to this assembly.

The picture above right tells it all. Installers get the chance to assemble the power electronics, inverter, charge controller, breakers, arrestors, battery status monitors, displays etc in the shop. The system as shown here can be tested in the shop to insure that the system is functioning properly. This is one major advantage in using the E-Panel system. These E-Panels can be field modified to be right hand units. A right hand door is required to do this in the field.

Wiring diagram for all 120VAC E-Panels. This diagram also works for the 230VAC export version. The 230VAC E-Panel is wired using blue and brown wire rather than white and black

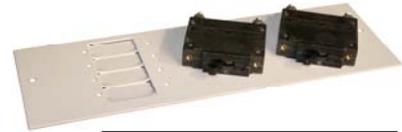


The Magnum Energy 240VAC E-Panel for MS and RD series

This is our flagship E-Panel. It encompasses every suggestion and update we are aware of. It also accommodates the new Magnum Energy MS4448-AE and MS4024-AE inverters. These inverters are a true 120/240 input and output. Unlike the regular Magnum MS and RD series that have a second 120VAC pass through leg, these inverters are like having a stacked pair of inverters. It will charge from either a 120VAC source or a 240VAC source. The output is 120/240 just like the utility grid. Compare this system with a stacked pair of inverters (from any company) and you will realize thousands of dollars of savings!



- Features:
- White steel chassis to match the MS series
 - Black and red AC input terminal busbars
 - Black and red AC output terminal busbars
 - Red terminal bus bars for PV+ and Bat+
 - Six additional din rail slots
 - 500A shunt
 - Ground Busbar
 - Remote bracket
 - Wall mounting brackets
 - Inverter cables
 - Charge control mounting bracket
 - 120/240 AC bypass switch pre-wired
 - 120/240 AC input disconnect pre-wired



Apollo kit 240 \$69

- Model numbers:
- MNE175STM-L-240 (for MS4448-AE)
 - MNE250STM-L-240 (for MS4024-AE)
 - Change -L to -R for right hand hinge.

Price \$799.00

The Lite Series



Generic E-Panels for SW, DR or what have you? These do not include inverter cables or charge control brackets. **All** Lite's come with left hand doors only, but can have the breakers exit either side. Special Lite's can be made using the wide Magnum sized chassis also. Call for models and pricing.

- Model numbers
- Specify -L or -R for breaker placement
- MNE125LT \$419
 - MNE175LT \$459
 - MNE250LT \$459
 - MNE125ALT \$459
 - MNE175ALT \$499
 - MNE250ALT \$499



(Left) A BLM installation from the 1990's.

(Right) The same installation redone in 2007 by John Raynes using the MidNite Lite.



Breakers to fit on din rails

- 150VDC 13mm wide: 1,2,3,4,5,6,7,8,9,10,12,15,20,30,40,50,63 amps \$13.00 list (example MNEPV15)
- 150VDC 63 amp (MNDC-GFP) \$69.00 list
- 120VAC 13mm wide: 10,15, 20 amps UL489 branch circuit rated \$15.00 list (example MNEAC15)
- 120VAC 13mm wide: 30,40, 50, 60 amps UL1077 supplementary protection \$15.00 list (MNEAC50)
- 277VAC three phase breakers 39mm wide: 30 & 50 amp (MNEAC30-3P) and (MNEAC50-3P) \$54.00 list
- Internally used white short face 120VAC UL1077 15, 30 and 50 amp \$15.00 list (MNEAC15 QZD)
- Internally used white short face 2 pole 120/240VAC UL1077 30, 50 and 60 amp \$30.00 list (MNEAC50 QZD2)



After building the first prototype E-Panel, we took it to Hawaii where two professional installers and a distributor tore the design apart. It was back to the drawing board after that trip. The E-Panel has undergone a hundred changes over the last couple of years thanks to suggestions from users and installers.

Yes, there are two guys standing on the door of an E-Panel with the door open and inverter installed. This was actually a UL required test of the hinged door.



Ms. Morales. Just one of thousands of satisfied customers. The money she saved by using the MidNite E-Panel was Enough to buy another PV panel! This installation was done by Positive Energy. Santa Fe, New Mexico.

Another Positive Energy installation

