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MNPV Installation Instructions



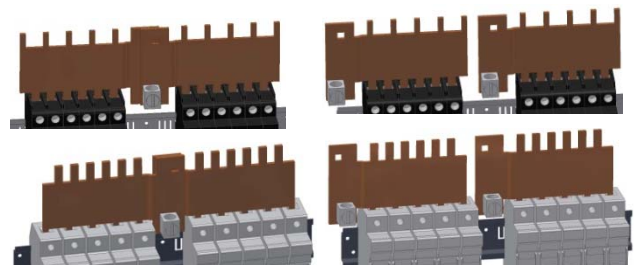
IMPORTANT SAFETY INSTRUCTIONS

Save these instructions – This manual contains important instructions for Models MNPV12, MNPV12-250, MNPV16, MNPV16-250

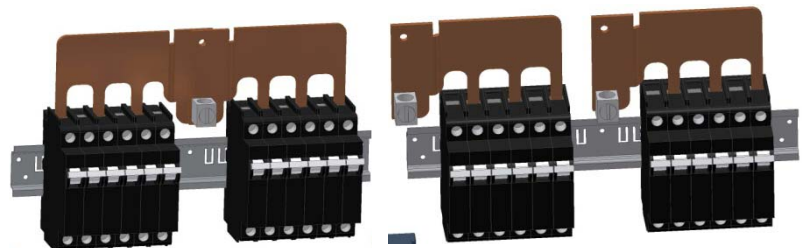
Configurations:

The MNPV12 and MNPV16 combiners are listed for outdoor use. These PV combiners are designed for combing PV strings up to 150 & 300 VDC using MNEPVXX circuit breakers, and up to 600VDC using MNTS touch safe fuse holders.

The **MNPV12** comes with a 200 amp plus busbar that works with up to ten fuse holders or twelve 150VDC circuit breakers. Two busbars can be joined together, or separated to create two systems up to 5 strings of fuse holders or 6 strings of breakers each. The pictures to the right show breakers on the top row and fuse holders on the bottom row.



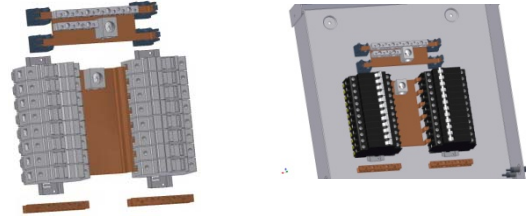
The **MNPV12-250** comes with 168 amp busbars that work with up to six of the MidNite 300VDC breakers. The MNPV12-250 busbars may be joined to accommodate 6 strings or separated for two independent sets of three strings.



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The **MNPV16** comes with a 240 amp plus busbar to accommodate up to 16 touch safe fuse holders.

The **MNPV16-250** comes with a 240 amp plus busbar that accommodates up to twelve 300VDC circuit breakers.



Note: The amperage rating of the plus busbars is noted above to help insure that the maximum current rating is not exceeded in any field configuration.

The MNPV series of combiners may be used as a DC load center as well as a PV combiner.

Note: Touch safe fuse holders should never be opened under load! This is not one of those warnings to gloss over! If opened under load, you WILL have a fire and it will not stop until the wires burn in half. There is a good reason we make the enclosures out of metal.

Model	Max VDC	PV Source Circuits				PV Output Circuits			Approved Mounting Orientation	Enclosure Type / Material	Listing
		Max # of Input Circ.	Max OCPD Rating Amps	OCPD Type	Wire Range AWG	Max # of Output Circ.	Max Cont. Current amps	Wire Range AWG			
MNPV3 (LV)	150	3	20	CB 150V	14-6	1	60	14-1/0	90 to 14°	3R / Alum	UL1741
MNPV3 (HV)	600	3	20	FUSE	14-6	1	60	14-1/0	90 to 14°	3R / Alum	UL1741
MNPV6 (LV)	150	6	20	CB 150V	14-6	2	120	14-1/0	90 to 14°	3R / Alum	UL1741
MNPV6 (HV)	600	4	20	FUSE	14-6	2	80	14-1/0	90 to 14°	3R / Alum	UL1741
MNPV12 (LV)	150	12	30	CB 150V	14-6	2	200	14-2/0	90 to 14°	3R / Alum	UL1741
MNPV12 (HV)	600	10	40	FUSE	14-6	2	200	14-2/0	90 to 14°	3R / Alum	UL1741
MNPV12-250	300	6	50	CB 300V	14-6	2	168	14-2/0	90 to 14°	3R / Alum	UL1741
MNPV16 (HV)	600	16	15	FUSE	14-6	1	240	250MCM	90 to 14°	3R / Alum	UL1741
MNPV16-250	300	12	20	CB 300V	14-6	1	240	14-2/0	90 to 14°	3R / Alum	UL1741

Features:

All aluminum powder coated housing. Won't rust or degrade due to sun exposure.

Flip up cover that can stay in the open position during installation

PV Negative bus bar with openings for #14-6 and #1/0-14)

Chassis ground bus bar with #14-6 and #1/0-14 wire openings

Standard din rail for mounting breakers or fuse holders

Tin plated copper bus bars to combine breaker and fuse holder outputs

Dead front cover snaps into place after wiring is complete for safety

Knock outs for PV in and PV out on bottom and sides

PV IN knockouts are 1/2" & 7/8" concentric to allow for bulkhead mount MC connectors or strain reliefs

Top surface is available to bring conduit in from directly above the enclosure

Note: The plastic dead front fits very tight. You must first remove the lid in order to remove the dead front.

The installation of a PV combiner is fairly straight forward. Select the location to install your combiner first.

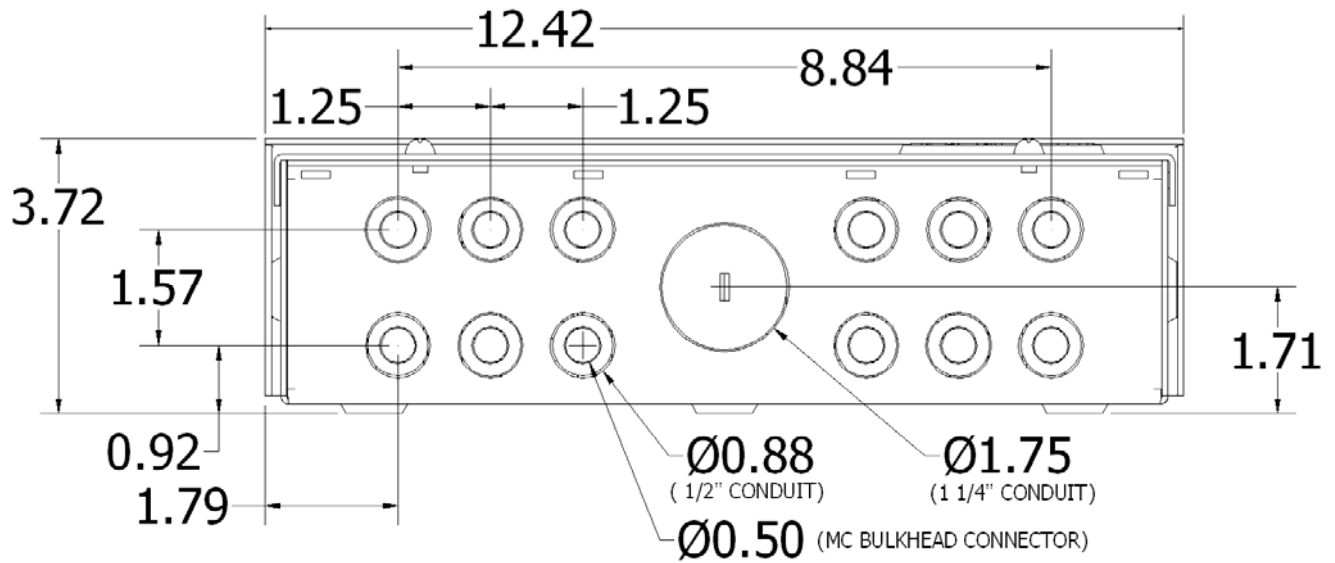
Some systems have the PV modules located close to the inverters and or battery system. If this is the case, you

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can elect to mount the MNPV inside and run each PV string down to the MNPV inside the building. This is convenient for trouble shooting and upgrading. For longer runs the combiner will be mounted outdoors on a pole for pole mounted PV arrays or similar mounting for rack mounted arrays. The combiner can be mounted in the vertical position or slanted backwards to accommodate up to a 3/12 roof pitch. All unused holes should be blocked using RTV sealant or some similar goop in order to keep rain and bugs out of the enclosure. It is very common for critters to enter through an unused mounting hole and take up roost. They will eventually degrade the performance of your system to say nothing of the yuk factor upon discovery of their nest.



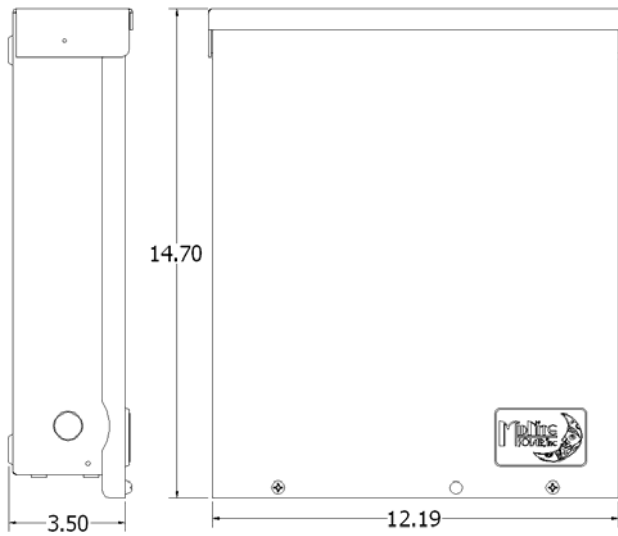
The following dimensioned drawings show the enclosure size and location of knockouts available on the MNPV12&16. Lightning arrestors may require a locknut on the outside in order to clear the lid.



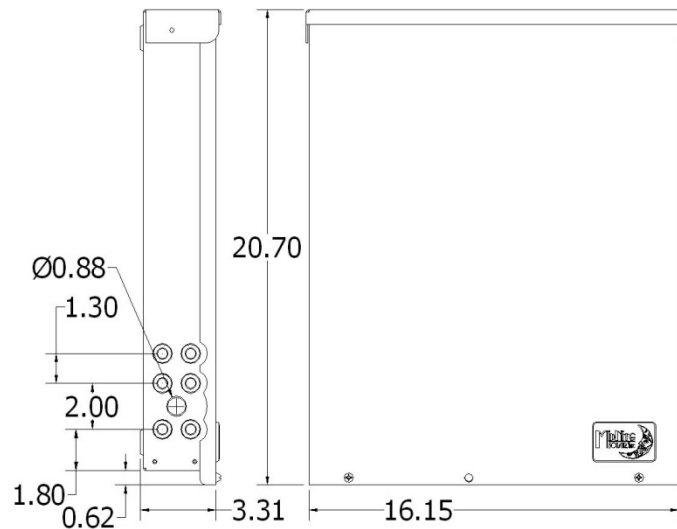
MNPV12 bottom dimensions

Two 7/8" knockouts (1/2" conduit openings) are located on the sides of the MNPV12. These are primarily intended for lightning arrestors. One 1 1/4" conduit knockout is located on the back mounting surface.

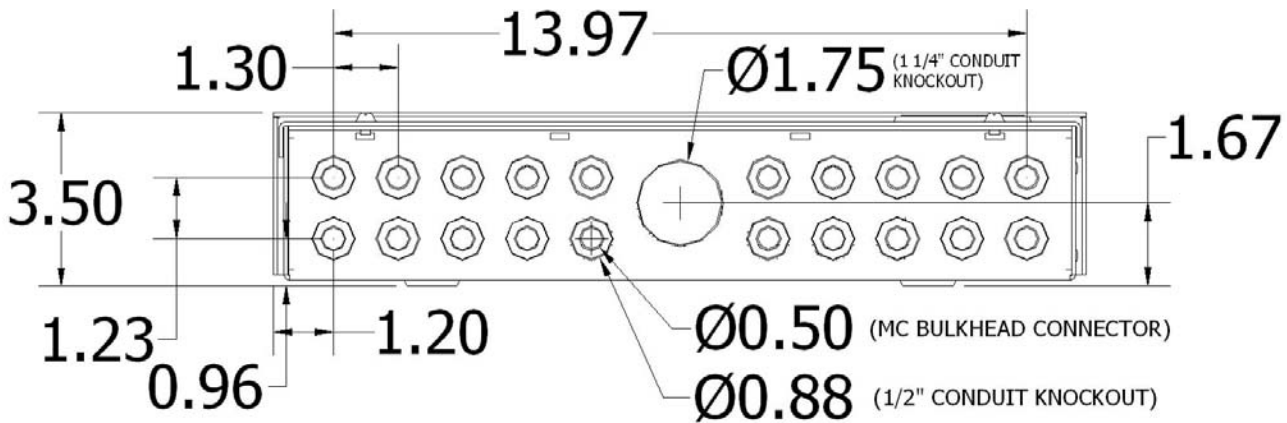
MNPV Installation Instructions (continued)



MNPV12 side and front dimensions

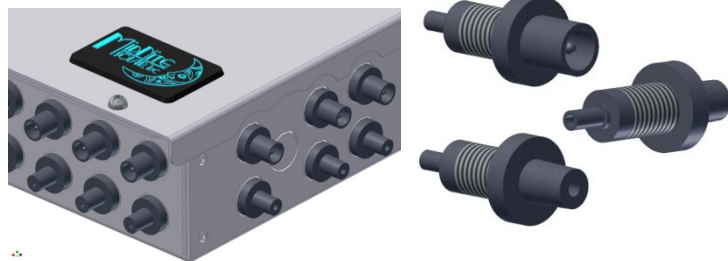


MNPV16 side and front dimensions

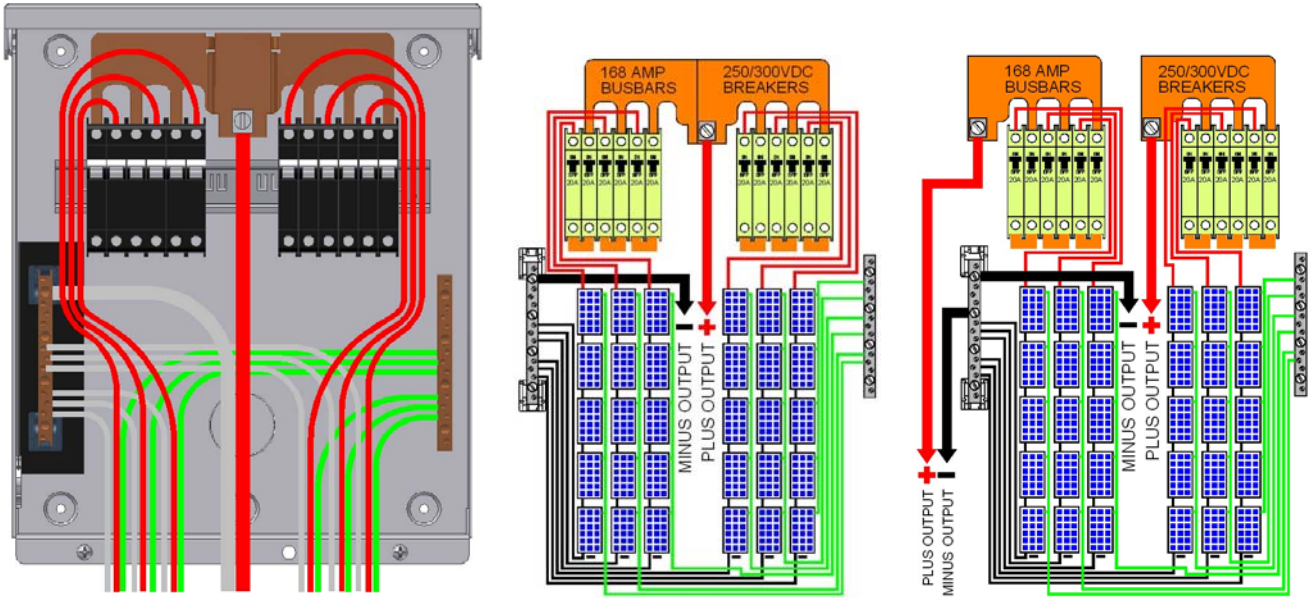


MNPV16 bottom dimensions

PV input knockouts for these combiners are a dual concentric knockout that can accept bulkhead mount MC cable connectors. Configuring these enclosures with the bulkhead mount connectors in advance can save time in the field. Several brands will fit the 1/2" diameter knockouts.

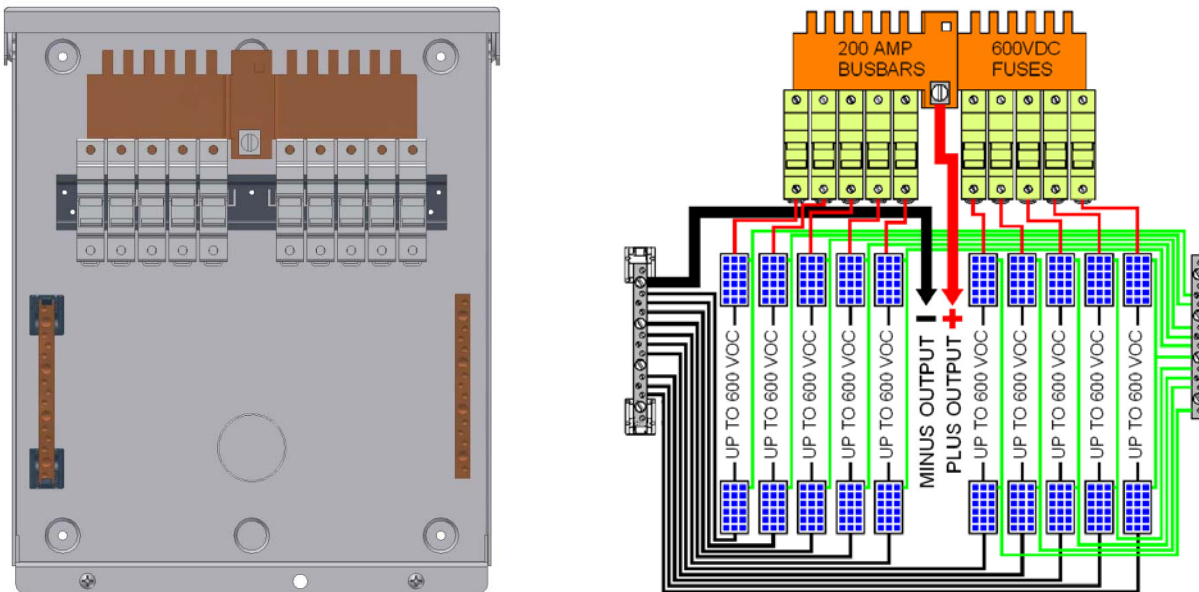


MNPV Installation Instructions (continued)



Internal wiring MNPV12-250 busbars joined Wiring diagram for MNPV12-250 (joined & separated)

The MNPV12 has 2/0 box lugs for the plus busbars and 1/0 openings on the PV minus and ground. Note: the MNPV12-250 has special busbars that are made exclusively for the MidNite 300 volt breakers. These breakers take up the space of two regular 13mm wide breakers. The 300 volt breakers are used for high voltage off-grid PV arrays that will employ the MidNite Classic 250 MPPT controller. The 250 volt busbar is rated for up to 168 amps continuous.



MNPV12 with MNTS fuse holders MNPV12 wiring diagram with MNTS fuse holders

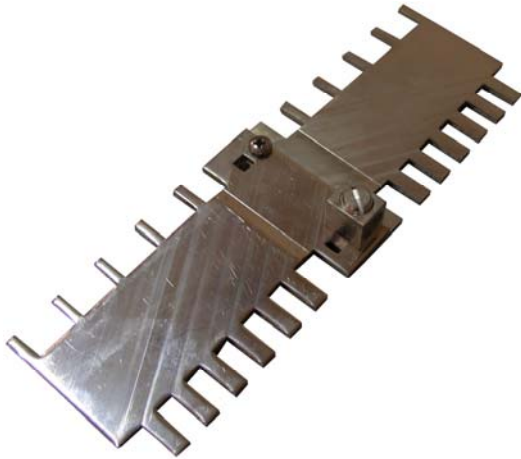
The regular MNPV12 comes with a 1/8" thick reversible copper busbar. This busbar may be used with fuse holders above or with 150VDC breakers shown below. The busbars are rated for up to 200 amps.

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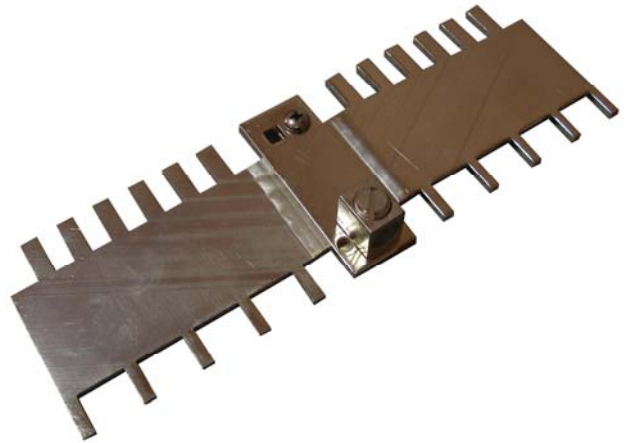


To remove the dead front:
Pry off the lid as shown using something like a screwdriver as a lever.
The dead front will then come out easily.

Use the hardware supplied to connect the terminal box lug to the busbars. 1 10-32 x 3/8" screw, one star washer and one box lug. Connect the top side of one busbar to the other using one 10-32 x 3/8" screw and one kepnut.



Box lug and screw placement for circuit breaker configuration



Box lug and screw placement for fuse holder configuration



Photos of the first MNPV12 installation in Minnesota. Photos compliments of Daryl Thayer