

# SAFETY AND DISCONNECT EQUIPMENT

To have a safe code compliant photovoltaic system you need to install the appropriate disconnects, fuses and/or breakers throughout your system. The National Electrical Code (NEC) states that a disconnect is required for every piece of equipment (charge controllers, inverters, etc.) to isolate them from all sources of power (solar modules, batteries and generators). This might sound complicated, but it is really pretty easy. On the following pages you will find several disconnect and overcurrent protection options for your system. If you aren't sure which disconnects you should use and where, just give your KSI dealer a call and he can point you in the right direction.



## SMA PV Combiner Boxes

The Sunny Boy Combiner Boxes, SBCB 6-90 & SCCB 28-420, make installing large projects easier. The large NEMA 3R enclosures provide ample room for conductors and will help reduce installation time. Designed with installers in mind, you'll find the new SBCB & SCCB Combiner Boxes, a welcome addition to the SMA product line.

| Product Name and Description   | Part Number |
|--|-------------|
| <b>SBCB 6</b> Combiner box<br>600VDC Max, 90 Amps Max output current (72A continuous), 3R Enclosure, 6 positive, 6 negative PV inputs, 10-6 AWG input wire size, 6-300MCM output wire size, 1-20 Amp circuits. Midget input fuse, 10"H x 8"W x 6"D, Shipping weight: 12 lbs.     | 705454      |
| <b>SBCB 12</b> Combiner box<br>600VDC Max, 3R Enclosure, 12 PV inputs, 10-6 AWG input wire size, 6-300MCM output wire size, 1-20 Amp circuits. Midget input fuse, 16"H x 16"W x 6"D, Shipping weight: 30 lbs   | 705455      |
| <b>SCCB 28</b> Combiner box<br>600VDC Max, 420 Amps Max output current (340A continuous), 3R Enclosure, 28 positive, 28 negative PV inputs, 10-6 AWG input wire size, 6-300MCM output wire size, 15 Amps 600VDC Midget Max. input fuse size, 20"H x 20"W x 8"D, Shp. wt.: 55 lbs | 704184      |
| <b>SCCB 52</b> Combiner box<br>600VDC Max, 4 - 8 Amp circuits, 3R Enclosure, 52 positive, 52 negative PV inputs, 10-6 AWG input wire size, 6-300MCM output wire size, 42"H x 30"W x 8"D, Ships via truck, call for details   | 705456      |
| <b>Combi-Switch</b> - Combination DC disconnect and PV combiner box. The combi-Switch is designed for the Sunny Boy 6000U inverter. Four-circuit fused protection in a NEMA 3R steel enclosure. 5 year warranty  | 704200      |
| <b>DC Disconnect</b> - 600VDC, 18A (per pole), 30A (2 poles in series) Square D HU361RB Lockable, Visible blade disconnect. ETL listed, NEMA 3R Enclosure, 5 year warranty   | 704196      |
| <b>Fused DC Disconnect</b> - 600VDC, 18A (per pole), 30A (2 poles in series) Square D H361RB Lockable, Visible blade disconnect. ETL listed, NEMA 3R Enclosure, 5 year warranty, Fuses not included.   | 704197      |



**SMA SBCB 6**



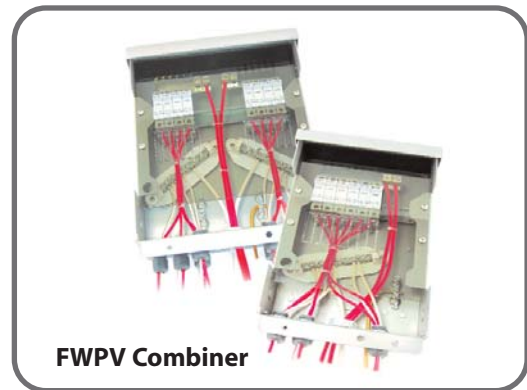
**Combi-Switch - DC Disconnect  
Fused DC Disconnect**



## OutBack Power System PV Combiner (FWPV)

OutBack offers a PV array combiner which can be used with a wide variety of PV system designs and module configurations. It can be configured with DC breakers for low voltage systems (under 150 VDC) or touch safe type fuse holders for high voltage systems (up to 600 VDC). FWPV is designed to provide NEC code compliant overcurrent protection and interconnection of multiple PV panels or sub-arrays into one or more PV arrays for connection to charge controllers or inverter systems. The FWPV is easily field configured to match your PV system design and ampacity requirements. The FWPV PV Combiner provides series over-current protection of PV module circuits allowing NEC compliant installation. FWPV-8 includes space for up to **eight** 150 VDC rated breakers or **six** 600 VDC rated fuse holders. Includes one positive output bus bar with two #2/0 terminals, one insulated negative TBB and one ground bar. The FWPV-12 accommodates up to **twelve** 150 VDC rated breakers or **eight** 600 VDC fuse holders. Includes two insulated neg. TBB's, one ground bar and two combiner bus bars. Enclosure only without breakers or fuse holders.

| Product Name and Description | Part Number | Price    | Shipping Weight (lbs.) |
|------------------------------|-------------|----------|------------------------|
| FWPV-8                       | 706358      | \$139.00 | 5.0                    |
| FWPV-12                      | 706359      | \$199.00 | 10.0                   |



FWPV Combiner

### PV Array Breakers

DIN rail snap-in mount with #2 AWG setscrew type compression terminals. ETL listed for up to 150 VDC. **Maximum of twelve breakers.** Fits in the PSPV only.

| Product Name and Description | Part Number | Price   |
|------------------------------|-------------|---------|
| OBB-6-150VDC-DIN             | 704245      | \$14.00 |
| OBB-9-150VDC-DIN             | 705483      | \$14.00 |
| OBB-10-150VDC-DIN            | 704246      | \$14.00 |
| OBB-15-150VDC-DIN            | 704247      | \$14.00 |
| OBB-20-125VDC-DIN            | 705484      | \$14.00 |
| OBB-30-125VDC-DIN            | 704248      | \$14.00 |



OBB-15-125VDC-DIN

### High Voltage PV Array Fuseholder

DIN rail snap-in mount with #8 AWG setscrew type compression terminals. Touch-safe design. Not rated for load make or load break usage. UL listed for up to 600 VDC. **Maximum of eight fuseholders in one PSPV enclosure.**

| Product Name and Description     | Part Number | Price   |
|----------------------------------|-------------|---------|
| OBFH-30-600VDC-DIN (Fuse Holder) | 704244      | \$18.00 |
| OBF-6-600VDC (1A fuse)           | 705460      | \$18.00 |
| OBF-10-600VDC (10A fuse)         | 704578      | \$18.00 |
| OBF-15-600VDC (15A fuse)         | 705459      | \$18.00 |



OBFH-30-600VDC-DIN

## PV Ground Fault Protection

### OutBack DC Ground Fault Protection System

The OutBack Power systems GFP is required for PV arrays mounted on dwelling roofs. A GFP protects wiring and system components for one or two PV arrays: Dual 80 amp PV circuits 125 VDC max Voc. Requires three small breaker spaces. The GFP has 1/4" stud terminals. The OBB-GFP-80D-125VDC-PNL system includes the GFP unit, a ground bus bar, neutral and ground connection wiring and mounting hardware. The PSR includes mounting for only one GFP along with two PV disconnects and one large battery breaker. For use in OutBack PSR, FW1000-DC and FW500-DC's.

| Product Name and Description | Part Number | Price    | Shipping Weight (lbs.) |
|------------------------------|-------------|----------|------------------------|
| OBDC-GFP-80D-125VDC-PNL      | 704571      | \$129.00 | 2.0                    |



**OBDC**

## xantrex

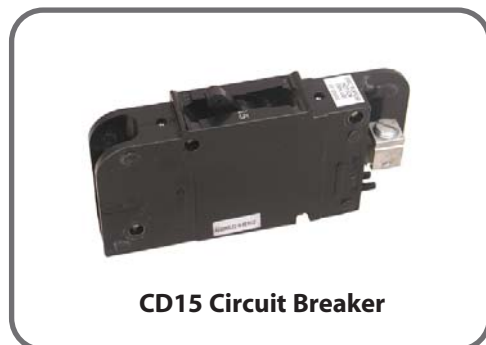
### Xantrex Disconnect

The Xantrex DC175 / DC250 disconnect offers the ultimate in terms of overcurrent protection and a disconnect means for your inverter all in one enclosure. It also interfaces very nicely with the Xantrex SW, PS & DR series inverters. These disconnects can also serve as a central wiring point for your system by housing a DC bonding block and/or shunt. Each disconnect comes with one main 175A or 250A breaker with space for adding a second breaker. Four smaller knockouts on the side can each house a 15-60A DC breaker for solar input or DC load output. Size 21" x 10.5" x 4.8".

| Product Name and Description                                  | Part Number | Price    | Shipping Weight (lbs.) |
|---|-------------|----------|------------------------|
| DC250 - 250 Amp breaker and enclosure (for #4/0 cables).      | 704219      | \$329.00 | 16.0                   |
| DC175 - 175 Amp breaker and enclosure (for #2/0 cables).      | 704222      | \$329.00 | 16.0                   |
| GJ250 - Additional 250 Amp breaker                            | 704223      | \$195.00 | 3.0                    |
| GJ175 - Additional 175 Amp breaker                            | 705225      | \$195.00 | 3.0                    |
| CD60DC - 60 Amp circuit breaker                               | 704225      | \$39.00  | 1.0                    |
| CD15 - 15 Amp circuit breaker                                 | 705451      | \$35.00  | 1.0                    |
| CD20 - 20 Amp circuit breaker                                 | 704226      | \$35.00  | 1.0                    |
| DCBB - Negative / ground block handles up to four #4/0 cables | 704224      | \$75.00  | 1.0                    |



**DC250  
Breaker / Enclosure**



**CD15 Circuit Breaker**



## MidNite Solar, Inc. PV Combiner (MNPV)

The MNPV3 and MNPV6 combiners are rated for outdoor use. Although designed primarily for combining PV strings up to 150VDC, the MNPV may be used for combining high voltage strings using MNATM fuses up to 15 Amps. The use of touch safe DIN rail mount fuse holders and fuses allow operation up to 600 Volts. The MNPV6 combiner comes with two copper bus bars. One for circuit breakers and one for fuses. The MNPV3 busbar is designed for circuit breakers only. MNPV6 is rated for 150VDC, 120 Amps total output.

MNPV6 accepts up to four strings using touch safe fuse holders rated for 600VDC, 60 Amps.

Can be used for a DC load center by using MNPV breakers.

MNPV combiners are powder coated aluminum.

PV negative bus bar and chassis ground bus bar have 14 useable openings (10 #14-6 and 4 #1/0-14)

Both feature a dead front cover for safety.

Knock outs on bottom and sides.

ETL listed for exterior use in the US and Canada for up to 3/12 pitch

MNEPV breakers are available in: 1,2,3,4,5,6,7,8,9,10,12,15,20,30,40,50 & 63 Amps



**MNPV 6 Combiner**

| Product Name and Description   | Part Number | Price    | Shipping Weight (lbs.) |
|--------------------------------|-------------|----------|------------------------|
| MNPV-3                         | 706521      | \$89.00  | 2.0                    |
| MNPV-6                         | 706947      | \$109.00 | 4.0                    |
| MNTS Touch Safe fuse holder    | 706949      | \$13.00  | <1.0                   |
| MNATM6 600VDC, 6 Amp fuse      | 706971      | \$13.00  | <1.0                   |
| MNATM10 600VDC, 10 Amp fuse    | 706972      | \$13.00  | <1.0                   |
| MNATM15 600VDC, 15 Amp fuse    | 706973      | \$13.00  | <1.0                   |
| MNPV6 BUSBAR                   | 706522      | \$15.00  | <1.0                   |
| MNPV6 FUSE BUSBAR              | 706528      | \$13.00  | <1.0                   |
| MNPV3 BUSBAR                   | 706523      | \$13.00  | <1.0                   |
| MNEPV15 DIN rail mount breaker | 706524      | \$13.00  | <1.0                   |
| MNEPV20 DIN rail mount breaker | 706974      | \$13.00  | <1.0                   |
| MNEPV30 DIN rail mount breaker | 706975      | \$13.00  | <1.0                   |

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## OutBack AC/DC Breakers

### DC Overcurrent Protection

These 125 VDC rated breakers are for DC inputs / loads and power inverters. The Amps Interrupt Capacity, AIC, rating is in accordance with UL489.

| Product Name and Description | Part Number | Amperage | Stud Terminal Size | Price    | Shipping Weight (lbs.) |
|------------------------------|-------------|----------|--------------------|----------|------------------------|
| OBB-250-125VDC-PNL           | 704254      | 250      | 3/8"               | \$137.00 | 3.0                    |
| OBB-175-125VDC-PNL           | 704255      | 175      | 3/8"               | \$137.00 | 3.0                    |
| OBB-125-125VDC-PNL           | 704249      | 125      | 5/16"              | \$63.00  | 1.0                    |
| OBB-100-125VDC-PNL           | 704256      | 100      | 5/16"              | \$63.00  | 1.0                    |
| OBB-80-150VDC-PNL            | 705480      | 80       | 1/4"               | \$27.00  | 1.0                    |
| OBB-60-150VDC-PNL            | 704257      | 60       | 1/4"               | \$27.00  | 1.0                    |
| OBB-50-150VDC-PNL            | 705468      | 50       | 1/4"               | \$27.00  | 1.0                    |
| OBB-40-150VDC-PNL            | 704258      | 40       | 1/4"               | \$27.00  | 1.0                    |
| OBB-30-150VDC-PNL            | 704259      | 30       | 1/4"               | \$27.00  | 1.0                    |
| OBB-20-125VDC-PNL            | 704279      | 20       | 1/4"               | \$27.00  | 1.0                    |
| OBB-15-150VDC-PNL            | 704260      | 15       | 1/4"               | \$27.00  | 1.0                    |
| OBB-10-150DC-PNL             | 704261      | 10       | 1/4"               | \$27.00  | 1.0                    |



**DC Overcurrent Protection**

### AC Overcurrent Protection

All AC breakers are DIN rail snap-in mount and can be used for AC input or load circuits. All breakers accept #2 to 14 AWG wire. OutBack AC breakers are hydraulic magnetic type which are not sensitive to ambient temperature like other breakers in the market.

| Product Name and Description | Part Number | Amperage | Panel Space Width | Price   |
|------------------------------|-------------|----------|-------------------|---------|
| OBB-60-277VAC-DIN            | 704567      | 60       | 1/2"              | \$20.00 |
| OBB-50T-480VAC-DIN           | 704566      | 50       | 1 1/2"            | \$63.00 |
| OBB-50D-480VAC-DIN           | 704243      | 50       | 1"                | \$41.00 |
| OBB-50-277VAC-DIN            | 704242      | 50       | 1/2"              | \$20.00 |
| OBB-30T-480VAC-DIN           | 704565      | 30       | 1 1/2"            | \$63.00 |
| OBB-30D-480VAC-DIN           | 704564      | 30       | 1"                | \$41.00 |
| OBB-30-277VAC-DIN            | 705470      | 30       | 1/2"              | \$20.00 |
| OBB-15-277VAC-DIN            | 704563      | 15       | 1/2"              | \$20.00 |
| OBB-10-277VAC-DIN            | 704562      | 10       | 1/2"              | \$20.00 |
| OBB-25D-240VAC-DIN           | 705466      | 25       | 1"                | \$41.00 |
| OBB-20D-240VAC-DIN           | 704561      | 20       | 1"                | \$41.00 |
| OBB-20-120VAC-DIN            | 704241      | 20       | 1/2"              | \$20.00 |
| OBB-15D-240VAC-DIN           | 705469      | 15       | 1"                | \$41.00 |
| OBB-15-120VAC-DIN            | 704240      | 15       | 1/2"              | \$20.00 |



**AC Overcurrent Protection**