

PV SEGMENTING BREAKER

OutBack Power Systems now offers a PV array disconnect designed specifically to work with the SMA Sunny Boy line-tie inverter systems. It can also be used with other high voltage utility interactive PV inverters or other applications such as large inverter power systems or water pumping systems, etc. Can also be used as a standard 600 vdc disconnect for a single high voltage PV array.

The PSSB is designed to provide NEC code compliant overcurrent protection and disconnect means of up to six separate low voltage PV subarrays into a single high voltage PV array for connection to a high voltage PV inverter. An optional AC breaker disconnect can also be field installed inside the same enclosure to provide a local means of disconnect at the location of the inverter.

Standard Features and Components



PSPV - PV array combiner (left) and a PSSB - PV segmenting breaker (right)

Both use the same aluminum raintight Nema-3R outdoor enclosure

- Outdoor, rainproof powder coated aluminum enclosure - can be installed on vertical or sloped surfaces down to a 3/12 pitch (14 degrees).
- Six pole load break rated "segmenting" circuit breaker disconnect - allows connection of up to six low voltage PV subarrays which are then connected in series to form a high voltage PV array. Each subarray is 48 vdc nominal with an open circuit of less than 100 vdc maximum.
- Reduces the hazards of working with high voltage wiring during installation and troubleshooting
- Allows easy comparison of each PV subarray for verification of PV panel performance
- 3/4 and 1 inch conduit knockouts - one on the bottom and one on the back - with enough clearance provided to punch up to a 2 inch conduit for larger cabling for long wire runs.
- Eight 1/2 inch knockouts on bottom for PV module or subarray input conduits or strain reliefs
- One 1/2 knockout on each side - with enough clearance provided to punch up to a 1-1/4 inch conduit for connecting multiple PSSBs together.
- One #1/0 AWG ground lug - can be located on inside or outside of enclosure - optional **GBB** for systems with multiple ground wires.
- Space allowed for the addition of current sensors and lightning protection components
- Optional 15 amp 240 VAC disconnect breaker can be field installed inside the same enclosure to provide a local means of disconnect at the inverter location.
- **Ratings:** 15 amps / 600 vdc maximum

*Easily
configured
in the field
for
YOUR
specific
PV system
design*

Optional Components

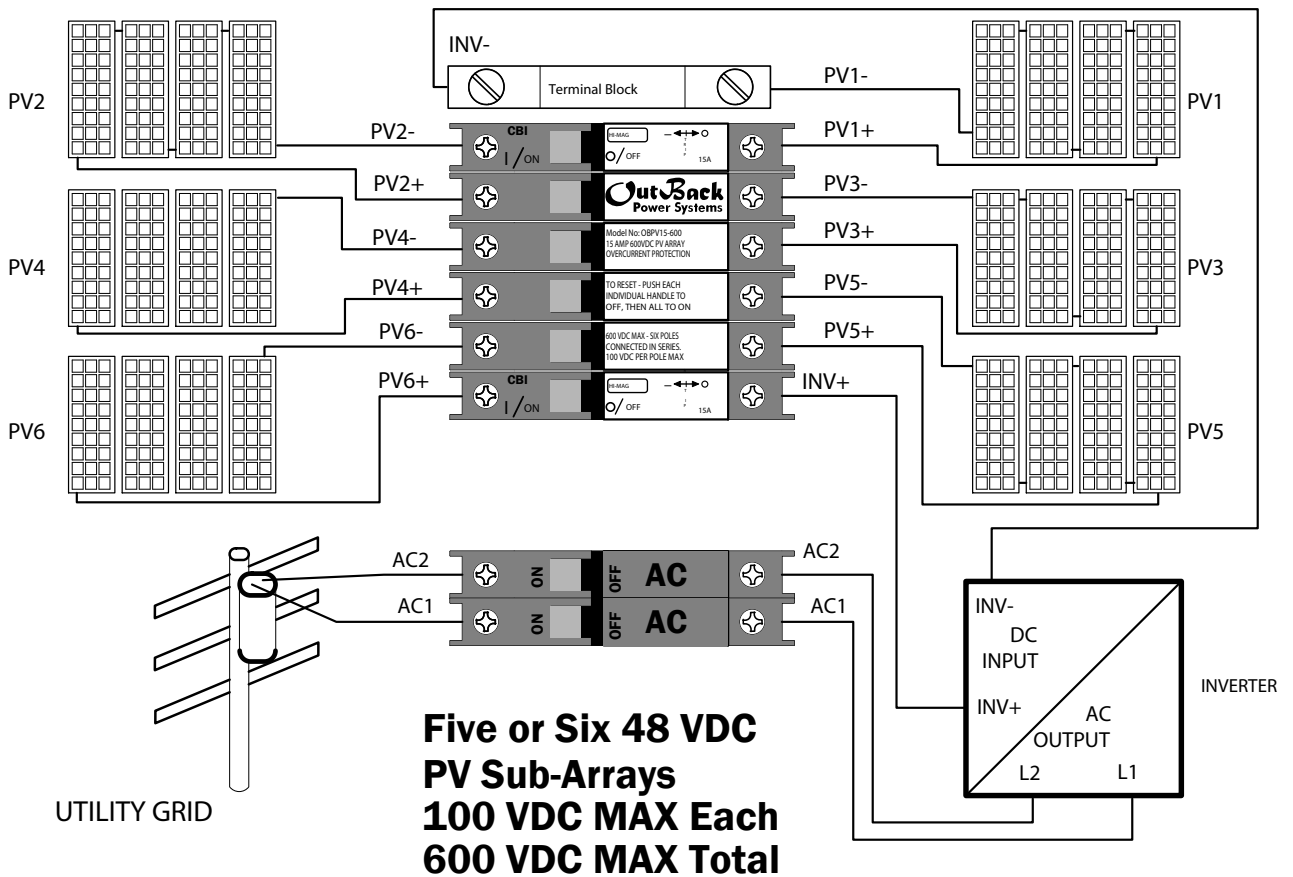
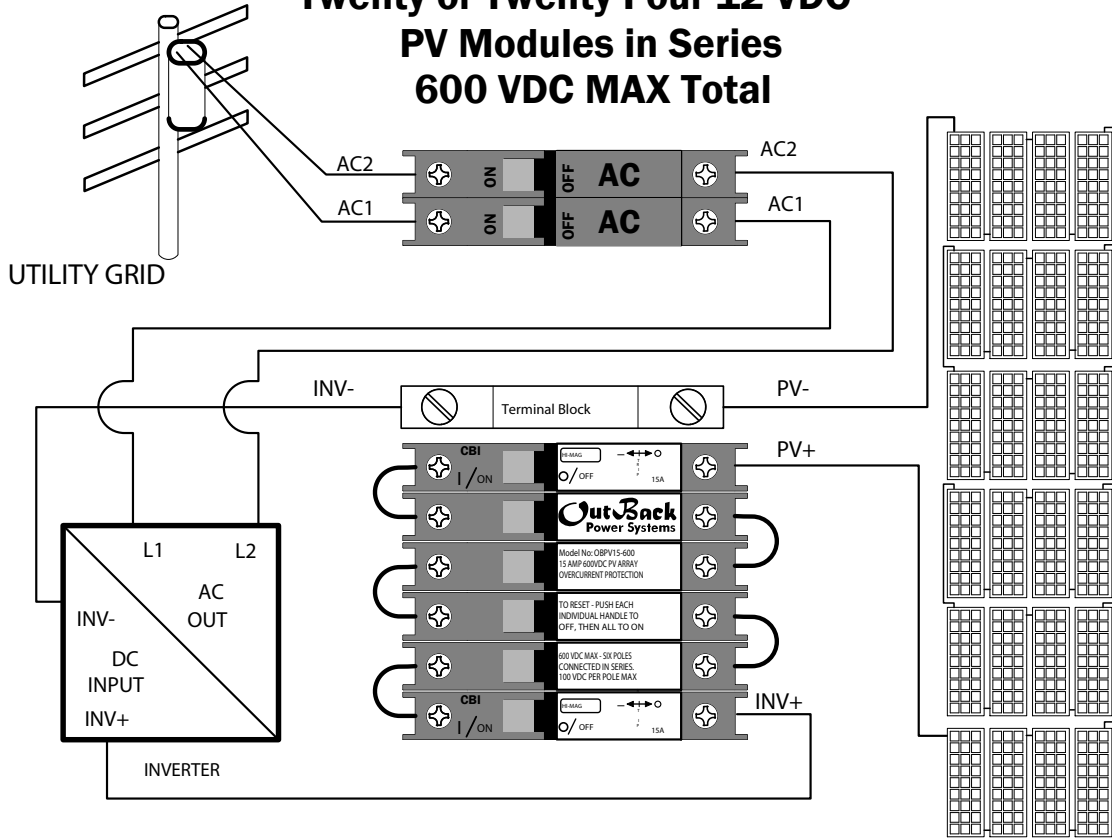
- **OBAC-15D** - AC breaker disconnect - 2 pole 15 amp 208 and 240 vdc load break rated - 10K AIC
- **GBB** - **Ground Bus Bar** - provides additional ground terminations - three #1/0 and eight #6 max.
- **PSSB-MP** - Mounting plate for one PSSB and a Sunny Boy Inverter - 16 & 24 inch mounting holes

Physical Dimensions

- **PSSB** enclosure: 9.2" wide x 3.5" deep x 13.1" tall (23.1cm x 8.7cm x 33.2cm)
- Shipping size: 10" x 4" x 14" Shipping Weight: 6 pounds (2.7 kG)

OutBack Power Systems - PSSB Wiring Diagram

**Twenty or Twenty Four 12 VDC
PV Modules in Series
600 VDC MAX Total**



**Five or Six 48 VDC
PV Sub-Arrays
100 VDC MAX Each
600 VDC MAX Total**

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS!

This manual contains important safety and installation instructions for the Outback Power Systems **PSDC**, **PSAC**, **PSR**, **PSPV** and **PSSB** products for use in residential and commercial applications. Consult local authorities as to national and your local electric codes and any additional installation requirements.

The **PSDC** and **PSAC** are ETL listed under the UL508A standard as industrial control panels. The **PSR**, **PSPV** and **PSSB** are ETL listed under the UL1741 standard as photovoltaic system accessories.

PRECAUTIONS AND SAFETY INSTRUCTIONS

1. Before using the product, read all instructions and cautionary markings on (1) the product, (2) the solar panels, inverter, batteries and controller (3) all appropriate sections of this instruction manual.
2. **CAUTION:** To reduce risk of electric shock, disconnect all DC and AC power sources before attempting any maintenance or repair. The input side of the AC and DC breakers may be live even though the breaker is off. Be sure to test all terminals with a volt meter before touching or using any tools. Always use caution when using metal tools to prevent contact with live parts or terminals.
3. No additional terminals or lugs are required for hook-up of the AC wiring. AC wiring must be no less than 14 AWG gauge copper wire, rated for 75°C or higher and must be sized appropriately to the circuit breaker.
4. The connection to the DC circuit breakers may require crimped lugs for the cable and wiring connections. The 250 and 175 amp breakers are available with either a stud or a set screw compression type box terminal. The large stud type breaker requires a ring terminal with a 3/8 inch hole. All of the 100 amp and smaller DC breakers require a lug with a 1/4 inch hole. Be sure to use the proper tools to crimp all ring terminals.
5. Additional AC and DC disconnects may be required as part of the system installation. Consult local and national electric code requirements.
6. **AC OVERCURRENT PROTECTION** – The AC input / output wiring is provided with circuit breakers for overcurrent protection. The breakers are branch circuit rated and have a 10,000 AIC rating at 240 VAC. They are suitable for both residential and commercial applications. Ensure that the AIC rating is sufficient for your application.
7. **DC OVERCURRENT PROTECTION** – The DC input / output wiring to the battery is provided with a circuit breaker for overcurrent protection. The large battery / inverter breakers are rated at 25,000 AIC rating for systems up to 125 VDC. The small PV array disconnect breakers are rated at 5000 amps AIC or higher. All breakers are suitable for both residential and commercial applications and are branch circuit rated. Ensure that the AIC rating is sufficient for your application. Contact OutBack for more information if required.
8. The AC input/output neutral conductor is **NOT** connected (bonded) to the metal chassis in the **PSAC**. All installations must be in compliance with all local and national electrical codes and standards.
9. The DC input/output negative conductor **IS** connected (bonded) to the metal chassis in the **PSDC** at the end of the terminal bus bar connected onto the DC current shunt via a screw and metal standoff. All installations must be in compliance with all local and national electrical codes and standards. If the connection to the chassis from the negative terminal bus is removed, an additional ground terminal bus must be installed.
10. **MOUNTING INSTRUCTIONS** – **PSDC** and **PSAC**: Indoor wall mount only. **PSR**: Indoor floor mount, attached to wall with screws through the frame or to the floor using the optional seismic kit (**PSR-SZ4**) to prevent tipping of the enclosure. Optional kit (**PSR-3RK**) allows outdoor use. The **PSPV** is approved for outdoor or indoor installation mounted vertically or on an inclined surface with the conduit knockouts at the bottom.
11. **GROUNDING INSTRUCTIONS** – The metal housing of the product must be connected to a permanent grounding system. System grounding as required by the National Electric Code, ANSI/NFPA 70-1996, is the responsibility of the system installer. A grounding terminal strip is provided for connection of equipment grounding conductors on the **PSDC** and **PSAC** enclosures. Ground connection of the **PSR** rack can be made from any of the structural fasteners of the frame itself. The **PSPV** includes a ground terminal lug.

PRODUCT DESCRIPTION

The OutBack Power Systems **PSAC**, **PSDC**, **PSR**, **PSPV** and **PSSB** allow easy installation of renewable energy power systems. All four products are designed and listed for assembly on site with many options which can be added by the system installer to meet the specific needs of an application.

The **PSAC** is designed to provide the AC electrical system overcurrent protection, disconnect and bypass functions for one or more inverters, a utility connection and a back-up generator. The **PSAC** can accommodate both Square-D **QOU** and OutBack **OBAC** breakers. It can also function as a load distribution panel for AC loads. An optional **X-240** autotransformer can be included to step AC power up or down to match load requirements or to balance a generator split phase output. The **PSAC** is designed to fit on the AC end of one or two Trace Engineering SW or DR inverter/charges or to mount next to a Vanner RE inverter with the optional **VREA** adapter plates. Other inverters and components can be added using commonly available electrical conduit or wireway fittings and components.

The **PSDC** is designed to provide the DC electrical system overcurrent protection, disconnect and manual control functions for one or more inverters, multiple PV arrays and other charging sources and the storage battery system. It can also function as a load distribution panel for DC loads. The optional **OBDC-GFP/2** ground fault protection system can be added to the **PSDC** which disconnects the PV array(s) if a DC or AC ground fault occurs in the DC system. The **PSDC** is designed to fit on the DC end of one or two Trace Engineering SW or DR inverter/charges or to mount next to a Vanner RE inverter with the optional **VREA** adapter plates. Up to three Trace C-series PV controllers or two RVPP Solar Boost MPPT controllers can be mounted on the top of the **PSDC**. An optional bracket **CCB** can be used to handle up to an additional three more Trace C-series controllers on the right or left side of a **PSDC**.

The **PSR** is designed to enclose the battery storage system an/or power electronics of a renewable energy system. Multiple **PSR** enclosures can be used if greater capacity is required. The **PSR** can include a battery/inverter disconnect breaker, one or two PV array disconnect breakers and a DC ground fault protection system in addition to the battery and power inverter/changer and controllers. The AC side of the renewable energy system is not designed to be installed into the **PSR** – you must use a **PSAC** or other standard AC components for the AC side of the installation.

The **PSPV** combiner is designed to provide overcurrent protection to multiple PV sub-array strings. It can be configured as a single or multiple output combiner. It is ETL listed for use with either OutBack **OBPV** breakers for systems with open circuit voltages up to 125 VDC or touch-safe type fuse holders (**OBFH**) for systems with open circuit voltages up to 600 VDC. The breakers or fuse holders can be installed in the field by the system installer based on the application requirements. An additional terminal bus bar (**TBB**) can be installed to allow separate combining of the negative conductors when a single **PSPV** is used to provide two PV output circuits. The **PSPV** can also be used as an enclosure for AC components up to 240 VAC.

The **PSSB** segmenting breaker disconnect is designed to provide overcurrent protection and means of disconnect for one to six PV subarrays. It is rated at a maximum of 600 VDC with six poles in series or 100 VDC per pole. An optional second 6 pole breaker (**OBBS-15**) and a 15 amp 2 pole breaker (**OBAC-15D**) can be field installed.

ENCLOSURE LAYOUT AND WIRING DIAGRAMS

The **PSAC**, **PSDC**, **PSR**, **PSPV** and **PSSB** enclosures utilize powder coated and electro-galvanized steel suitable for indoor and/or outdoor installations with knockouts for circuit breaker installation and conduit connections.

The **PSAC** is designed to enclose up to 16 Square-D **QOU** or **OBAC** breakers and a **X-240** step-up/step-down autotransformer. The enclosure includes standard a ground terminal bus, an isolated neutral terminal bus and a isolated hot terminal bus. The **PSAC** enclosure is shipped without the circuit breakers installed and is not pre-wired. A wiring diagram is included on the inside of the door which provides an example of typical system configuration.

The **PSDC** is designed to enclose several different sizes and types of breakers as well as control relays and other components. The maximum breaker size is 250 amps for the large breaker knockout locations and 100 amps for the small and medium breaker knockout locations. The **PSDC** enclosure includes standard a combination ground / negative terminal bus bar on a 500 amp current shunt and an isolated positive terminal bus bar. A wiring diagram is included on the inside of the door which provides an example of typical system configuration.

The **PSR** is designed to enclose several different sizes and types of batteries as well as circuit breakers and power electronic devices. The enclosure is shipped knocked down without the circuit breakers installed and is not pre-wired. There are no terminal bus strips included.

The **PSPV** is designed to hold up to twelve **OBPV** breakers or eight **OBFH** fuse holders and includes one **TBB** terminal bus bar standard. A wiring diagram is included with two examples of typical configurations.