OutBack Power Systems

PSX-240-Relay
Enclosed Autotransformer
With Auto-Disconnect
Installation Manual

Introduction

Congratulations on your purchase of the PSX-240-Relay Autotransformer with Auto-Disconnect from OutBack Power Systems. This booklet contains important safety and user instructions for the PSX-240-Relay that shall be followed during its installation and maintenance. Please read the entire booklet and all cautionary warnings on the PSX-240-Relay carefully before installing the device.

PLEASE SAVE THESE INSTRUCTIONS!

IMPORTANT SAFETY GUIDELINES

Working with or around electrical components requires care and special attention during installations. *Shock, burns, equipment damage, fire and even death can result from mishandling or incorrectly installing electrical equipment*. Please be aware of the following precautions:

- Installation must be performed by a licensed installer familiar with local and national wiring codes. All installations must comply with these codes as well as codes for structural installation.

- All of the AC wiring to the circuit breaker terminals and the neutral bus bar must be torqued according to the torque specs in the MECHANICAL INSTALLATION section of this manual.

- Wiring to circuit breaker terminals must meet requirements of the National Electric Code (NEC).

  NOTE: The circuit breaker terminals will accept up to 10 AWG wire. Use copper conductors only with insulation rated for at least 75˚ C. See the WIRING CONNECTIONS AND TORQUE SPECS section of this manual for more information.

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REGISTRATION

Your purchase of an OutBack Power Systems product is an important investment. Registering your products will help us maintain the standard of excellence you expect from us in terms of performance, quality and reliability.

Please take a moment to register and provide us with some important information.

Name: _____

Address: _____

City, State, Zip Code, Country:

_____

Telephone Number: _____

E-Mail: _____

Sold by: _____

Installer: _____

Purchase Date: _____

Model Number: _____

Serial Number: _____

Circle all that apply:

Off-Grid Installation	Residential Installation
North America Location	Utility Connected Installation
Commercial Installation	Other _____

Mail to: Attn: Warranty Registration
Outback Power Systems
19009 62nd Ave. NE
Arlington, WA 98223

- For equipment grounding hook up, see the WIRING CONNECTIONS AND TORQUE SPECS section in this manual. This product is intended to be installed as part of a permanently grounded electrical system per the NEC.

- The equipment ground on the PSX-240-Relay is marked with this symbol:

GENERAL PRECAUTIONS

- The PSX-240-Relay is approved for indoor mounting only in the positions described in the MECHANICAL INSTALLATION section of this manual.
- Do not disassemble the PSX-240-Relay beyond the instructions included in this manual. Refer servicing to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning.

Basic Description of the PSX-240-Relay

The PSX-240-Relay has an autotransformer containing, in its raw form, two sets of windings in a 1:1 ratio. By connecting wire #2 and wire #3 together, the X-240 can transform 120 VAC to 240 VAC and vice-versa. The X-240 is pre-wired within the enclosure for user convenience.

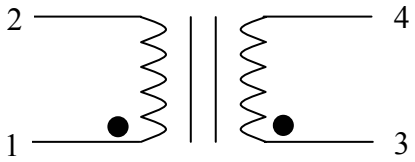

Figure 1
(● denotes start of winding)

Two 25 Amp AC circuit breakers and a neutral bus bar provide the input/output connection points for the X-240. The PSX-240-Relay contains a DPDT relay and three feet of wiring to control this relay. This relay will disconnect the X-240 from the system when an AC input source connects to the system.

Figure 2 on the next page shows the diagram for the internal wiring of the PSX-240-Relay.

WARRANTY

OutBack Power Systems

Two Year Limited Warranty

OutBack Power Systems Inc. warrants that the products it manufactures will be free from defects in materials and workmanship for a period of two (2) years subject to the conditions set forth below.

The limited warranty is extended to the original user and is transferable. The limited warranty term begins on the date of invoice to the original user of the product. The limited warranty does not apply to any product or part thereof damaged by a) alteration or disassembly, b) accident or abuse, c) corrosion, d) lightning, e) reverse polarity, f) repair or service provided by an unauthorized repair facility, g) operation or installation contrary to instructions pertaining to the product.

OutBack Power Systems' liability for any defective product or any part thereof shall be limited to the repair or replacement of the product, at OutBack Power Systems' discretion. OutBack Power Systems does not warrant or guarantee the workmanship performed by any person or firm installing its products.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION). OUTBACK POWER SYSTEMS' RESPONSIBILITY FOR MALFUNCTIONS AND DEFECTS IN HARDWARE IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS LIMITED WARRANTY STATEMENT. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LIMITED WARRANTY PERIOD SET FORTH ABOVE AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER SUCH PERIOD. SOME STATES (OR JURISDICTIONS) DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

OUTBACK POWER SYSTEMS DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES SET FORTH IN THIS LIMITED WARRANTY STATEMENT OR LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE. SOME STATES (OR JURISDICTIONS) DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU.

During the two year period beginning on the invoice date, OutBack Power Systems will repair or replace products covered under this limited warranty that are returned to OutBack Power Systems' facility or to an OutBack Power Systems authorized repair facility, or that are repaired on site by an OutBack Power Systems authorized repair technician. To request limited warranty service, you must contact OutBack Power Systems at 360-435-6030 within the limited warranty period. If limited warranty service is required, OutBack Power Systems will issue a Return Material Authorization (RMA) Number. Mark the outside of the package with the RMA number and include a copy of the purchase invoice in the package. You must ship the products back to OutBack Power Systems in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. OutBack Power Systems will ship the repaired or replacement products to you freight prepaid if you use an address in the continental United States, where applicable. Shipments to other locations will be made freight collect.

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PSX-240-Relay Diagram

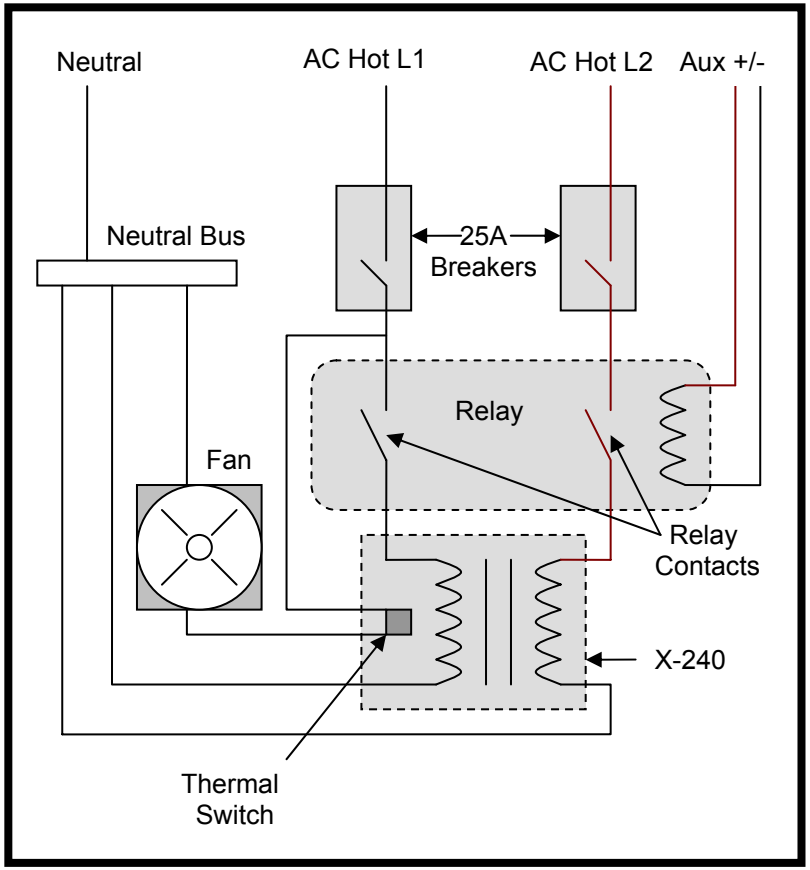

Figure 2

Configuration

The PSX-240-Relay must be connected to the AC output circuit of the FX system and is intended for installations that include the following:

- An installation with two or more OutBack FX Series Inverter/Chargers wired to produce split phase 120/240 VAC.
- The FX system is programmed using "OutBack" Stacking (***not*** "Classic" Stacking).
- AC input source to the FX system is either two in-phase 120 VAC circuits, 120/240 VAC split phase, or two phases of a 120/208 VAC wye-connected 3-phase source.

If your system does not conform to the configuration conditions described above, please contact your dealer.

Note:

- The proper connections must be made in the field. This information is located in the MECHANICAL INSTRUCTIONS section of this manual.
- The FX system must be programmed in order for the PSX-240-Relay to disconnect properly. This information is located in the PROGRAMMING INSTRUCTIONS section of this manual.

Step Down/Balancing Configuration

The step down/balancing configuration for the PSX-240-Relay allows large 120 VAC loads on one leg to be powered by FXs on opposite legs (step down). It also allows each FX to produce the same amount of power even though the L1 and L2 legs may have different power needs (balancing).

When an AC input is not present, 240 VAC between legs L1 and L2 is applied to the 25A breakers of the PSX-240-Relay. 120VAC is then available from either L1 or L2 to system neutral.

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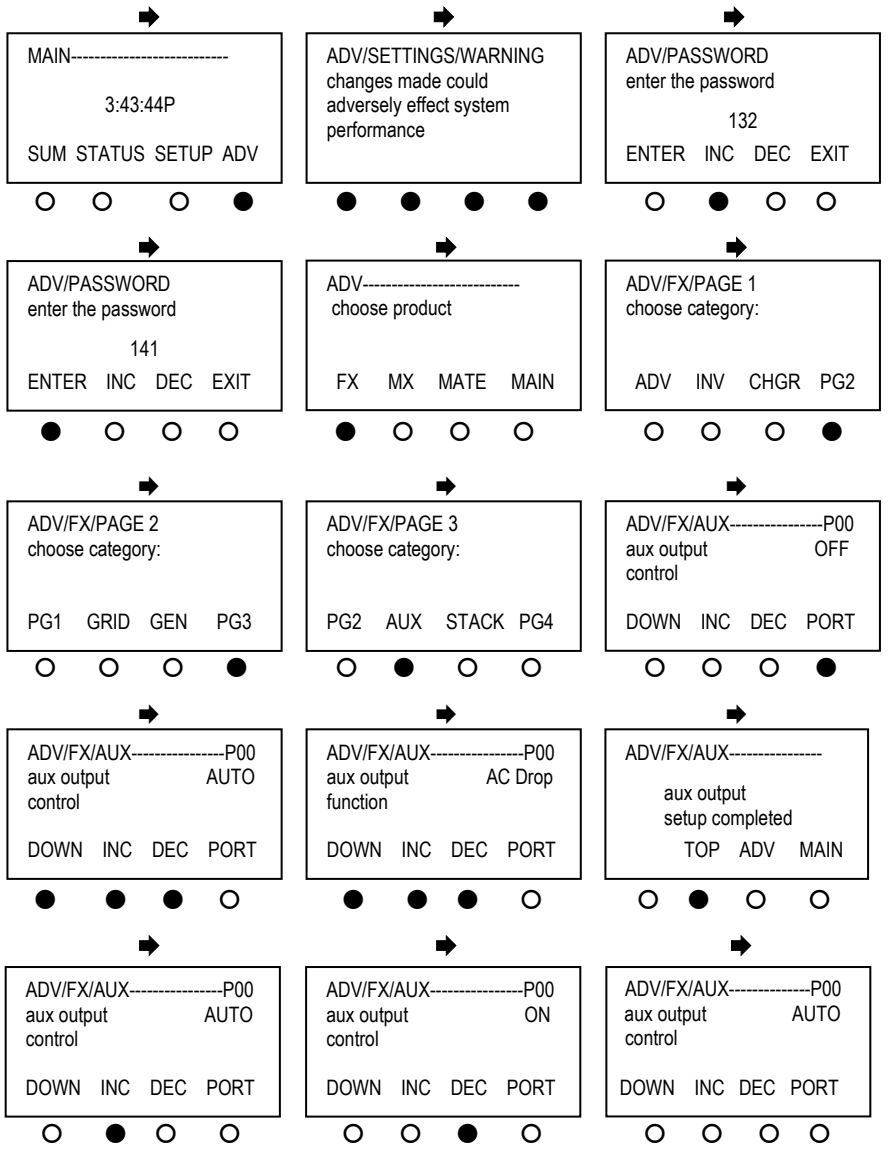

- If you don't hear a click, press **<DEC>** until the screen reads "OFF" and then **<INC>** until the screen reads "ON" and listen again for the click. If a click is heard, press **<DEC>** until the screen shows "AUTO" mode.
- If still no click is heard, repeat all programming instructions. Contact your dealer if the programming is unsuccessful.

With a successfully installed and programmed PSX-240-Relay, you can now enjoy the worry-free performance of your OutBack Power System.

Disconnect Configuration

When an AC input is present, the PSX-240-Relay will disconnect from the system when that AC input connects to the FX system. This ensures the PSX-240-Relay breakers do not trip if the AC input is not a 120/240 VAC power source.

A 12 VDC signal from the Auxiliary output of the one of the FXs in the system causes a relay to open at the precise time the AC input connects, effectively disconnecting the X-240 from the system.

Mechanical Installation

Please review the **IMPORTANT SAFETY GUIDELINES** and **GENERAL PRECAUTIONS** sections at the front of this manual before installing the PSX-240-Relay!

The PSX-240-Relay may be installed on a vertical or horizontal surface utilizing the four mounting holes on the base of the unit. The holes are sized to #10 screws. Be sure to use the appropriate style and grade of fastener for your particular application. The PSX-240-Relay can only be mounted in three positions.

Vertical Surface: The PSX-240-Relay breakers must be positioned either to the right or to the left of the PSX-240-Relay enclosure.

Horizontal Surface: The PSX-240-Relay breakers must be facing upward.

Wiring Connections and Torque Specs

The PSX-240-Relay is not supplied with the AC input wiring. This wire must be obtained elsewhere. The wires should be stranded, rated for the appropriate weather conditions, rated at least 75° Celsius, and be sized large enough for a 25A breaker to protect them per the NEC. There are multiple knock-outs on the PSX-240-Relay enclosure for routing these wires.

It is necessary to connect an AC neutral wire to the "AC Neutral" bus bar within the PSX-240-Relay. The torque for the screws in the neutral bus bar varies depending on the hole in which the wiring is installed. The larger of the two hole sizes in the neutral bar are the MAIN HOLES; the smaller holes are the TAP HOLES. The wire size range and torque specs are shown in the table below. Lower torque may be required when utilizing stranded wire.

Main Holes	Tap Holes
1/0-14 AWG: 50 in-lbs	6-14 AWG: 40 in-lbs

It is also necessary to connect an AC Hot L1 wire originating at the system's "AC Hot Out L1" bus to the left most breaker (assuming the breakers are positioned on the right side of the enclosure) and an AC Hot L2 wire originating at the system's "AC Hot Out L2" bus to the right most breaker within the PSX-240 Relay.

25A Breakers
10-14 AWG: 20 in-lbs

A ground lug is positioned near the breakers within the PSX-240-Relay. The ground wire making connection to this ground lug should be the same gauge as the neutral wire entering the PSX-240-Relay.

Ground Lug
2-14 AWG: 40 in-lbs

The PSX-240-Relay comes with three feet of 16 AWG SOOW, two-conductor control wiring. This control wiring connects to the Auxiliary + (AUX+) and Auxiliary – (AUX-) terminals of one of the FXs in the system. To locate these terminals, refer to the FX manual. The polarity of the auxiliary output connections does not matter, they will work either way.

There is some required MATE programming for proper operation of the PSX-240-Relay. This information can be found in the next section of this manual.

Programming Instructions

The following FX programming is necessary to use the auto-disconnect feature of the PSX-240-Relay. *Before programming, turn off the AC input breakers*. Also make sure that the control wires from the PSX-240-Relay are connected correctly to the Auxiliary + (AUX+) and Auxiliary – (AUX-) terminals of the FX that you intend to control the PSX-240-Relay.
Here are the programming steps (MATE screens shown on following page):

- From the MATE's "Main" screen, press the **<ADV>** soft key, key in the password, and then press the **<FX>** soft key.
- Press the **<PG2>** and **<PG3>** soft keys on the next two screens respectively.
- Press the **<AUX>** soft key on the ADV/FX/PAGE3 screen.
- If the FX intended to control the PSX-240-Relay is connected to a HUB, press the **<PORT>** soft key repeatedly until its port designation appears in the upper right corner of the screen.
- On the "Aux Output Control" screen adjust the value to "Auto" by using the **<INC>** and **<DEC**> soft keys.
- Press the **<DOWN**> soft key to get to the ADV/FX/AUX "Aux Output Function" screen.
- Adjust the value on this screen to "AC Drop" by using the **<INC>** and **<DEC>** soft keys.
- Press **< DOWN>** repeatedly until you reach the "End of Auxiliary Menu" screen.
- Press the **<TOP>** soft key to return to the "Aux Output Control" screen.
- Someone needs to be very close to the PSX-240-Relay to listen for a click ensuring the FX is correctly programmed and the PSX-240-Relay works properly. Press the **<ON>** soft key and listen for the relay in the PSX-240-Relay to click. Once you hear the click, press the <**DEC>** soft key to return the value to "AUTO".