

FW-X240 AUTO TRANSFORMER Installation Manual



FW-X240 Auto Transformer

About OutBack Power Systems

OutBack Power Systems is a leader in advanced energy conversion technology. Our products include true sine wave inverter/chargers, maximum power point charge controllers, system communication components, as well as breaker panels, breakers, accessories, and assembled systems.

Notice of Copyright

FW-X240 Auto Transformer Installation Manual © 2007 All rights reserved.

Disclaimer

UNLESS SPECIFICALLY AGREED TO IN WRITING, OUTBACK POWER SYSTEMS:

- (a) MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN ITS MANUALS OR OTHER DOCUMENTATION.
- (b) ASSUMES NO RESPONSIBILITY OR LIABILITY FOR LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, WHICH MIGHT ARISE OUT OF THE USE OF SUCH INFORMATION. THE USE OF ANY SUCH INFORMATION WILL BE ENTIRELY AT THE USER'S RISK.

Date and Revision - July, 2008

Contact Information:

OutBack Power Systems 19009 62nd Ave. NE Arlington, WA 98223

Phone: 360.435.6030 Fax: 360.435.6019 www.outbackpower.com

Welcome to the OutBack Power Systems FW-X240 Auto Transformer

The FW-X240 Auto Transformer can be used for step-up, step-down, generator and split phase output balancing or with series-stacked FX or VFX Series Inverter/Chargers for inverter balancing.

OutBack Power Systems does everything possible to assure the components you purchase will function properly and safely when installed as instructed according to local and national electrical codes (NEC). Please read all of the following instructions and the instructions that come with any other OutBack components that make up your power system.

The FW-X240 Auto Transformer Specifications:

- 120 volt/25 amp primary and secondary side
- 120 or 240 VAC 60 Hz systems only
- Allows powering 240 volt items (e.g., a deep well pump) with a single 120 volt AC source
- Step-down feature allows battery charging with both legs of a 240 volt generator through a single 120 volt FX Series Inverter/Charger

Two identical windings:

- Winding one is between leads #1 and #2
- Winding two is between leads #3 and #4
- The start for each winding are on lead #1 and on lead #3

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

Please read all instructions and cautionary markings on the FW-X240 and other system components and their instructional manuals.

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 breakers are off.
- Be sure to test all terminals with a voltmeter before touching or using any tools.
- Always use caution when using metal tools to prevent contact with live parts or terminals.
- All installations must be in compliance with all local and national electrical codes and standards.

Grounding Instructions

- The FW-X240's metal mounting bracket must be connected to a permanently grounded system. System grounding as required by the National Electric Code, ANSI /NFPA 70-1996, is the responsibility of the system installer.
- The FW-X240 hardware kit includes grounding washers to penetrate a powder-coated finish, assuring a proper ground connection to any FLEXware enclosure or mounting plate.
- An installation might call for an optional grounding wire between the FW-X240 and the FLEXware enclosure or mounting plate to which it's attached depending on local code requirements or the nature of the installation itself.

Connections

- No additional terminals or lugs are required for hook-up of the AC wiring.
- AC wiring must be no less than 10 AWG gauge copper wire, rated for 75 degrees C or higher and must be sized appropriately to the circuit breaker.

Hardware Kit

The FW-X240 comes with four M6 X 20 mm screws, four flat washers, and four grounding washers for mounting to a FLEXware Mounting Plate from inside a FLEXware AC enclosure.



The FW-X240 is installed inside a FLEXware enclosure which is designed for attachment to a FLEXware Mounting Plate.



Figure 2: FW500 AC Chassis

Note: The FW-X240 should be installed inside the FW500 after the FW500 is secured to the FLEXware Mounting Plate.



Figure 3 FW1000 AC Chassis

Notes:

- The FW-X240 should be installed inside the FW1000 after the FW1000 is secured to the FLEXware Mounting Plate.
- The FW-X240 can be fastened to other surfaces providing the surface and fasteners used can safely sustain a weight in excess of 25 lbs.



- L1: Black
- L2: Red
- Neutral: White
- TBB: Terminal Bus Bar

Figure 6: OutBack Stacking Wiring Diagram

- L1: Black
- L2: Red
- Neutral: White
- TBB: Terminal Bus Bar

Figure 7: FW-X240 Installation Balancing Two FX Series Inverter/Chargers (OutBack Stacking)*

- * Figure 9 shows current flowing from the L1 FX through the FW-X240 to run in parallel with the L2 FX output. The L1 inverter is producing almost half of the power required to power the load on L2 and at the same time is supplying power to its own L1 load.
- When both FXs are awake and producing power, a 240 Volt load will be powered by both inverters equally.
- If there is less than 1000 watts on L1, then the L2 FX will go to sleep. The FW-X240 is still active and producing 240VAC.
- A small 240VAC load would be powered from the L1 inverter and the FW-X240.
- A large load turning on will wake up the L2 FX. The L2 inverter will go back to sleep as soon as the large load on L2 goes away.

Note: Systems with more than four FXs might require two FW-X240s in parallel and require 35 amp breakers as well.

OFLEXware⁻ Product Registration

Please take a moment to register and provide us with some important information and return it to: Outback Power Systems Inc. 19009 62nd Ave. NE Arlington, WA 98223

NOTE: Please complete one form for all installed FLEXware product.

stem Owner me: Address: v, State, Zip Code: Country: ephone Number: E-mail: ephone Number: E-mail: istaller Contractor Number: mpany: Contractor Number: istaller Installer City, State, Zip: istaller E-mail: Installer City, State, Zip: istem Install/Commission Date: istaller for id Grid-Interactive off-Grid Grid-Interactive ase circle type of application: OB Kits Off-Grid Grid-Interactive AC Coupled Backup Mobile ase circle installed components: IOB Kits Xware 250 FLEXware MP FW-IOB-5-120VAC FW-IOB-T-120/208VAC Xware 500 AC FLEXware PV 8 FW-IOB-5-230VAC FW-IOB-0-120/240VAC Xware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC Xware 1000 DC FW-IOB-D-120VC FW-IOB-Q-230VAC System is equipped with (circle one): Xv240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: Xv104					
<pre>v, State, Zip Code: Country:</pre>	System Owner Name:		Address:		
ephone Number: E-mail: staller mpany: mpany: Contractor Number: ialler Address: Installer City, State, Zip: ialler E-mail: Installer City, State, Zip: stem Purchase Date: d by: Purchase Date: asse circle type of application: Off-Grid Off-Grid Grid-Interactive AC Coupled Backup asse circle installed components: IOB Kits Xware 250 FLEXware MP Xware 250 FLEXware PV 8 Xware 250 FLEXware PV 8 Xware 250 FLEXware PV 12 Xware 1000 AC FW-IOB-D-120/240VAC Xware 1000 AC FW-IOB-D-120/240VAC Xware 1000 DC FW-IOB-D-230VAC system is equipped with (circle one): -230VAC x/240 PSX-240 PSX-240 PSX-240-Relay	City, State, Zip Code:		Country:		
staller mpany: Contractor Number: taller Address: Installer City, State, Zip: taller Address: Installer City, State, Zip: taller E-mail: Installer City, State, Zip: stem Purchase Date: tem Install/Commission Date: Purchase Date: d by: Purchase Date: ase circle type of application: Purchase Date: Off-Grid Grid-Interactive AC Coupled Backup Mobile ase circle installed components: IOB Kits Xware 250 FLEXware MP FW-IOB-5-120VAC FW-IOB-T-120/208VAC Xware 500 AC FLEXware PV 8 FW-IOB-5-230VAC FW-IOB-T-230/400VAC Xware 1000 AC FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC FW-IOB-Q-230VAC Xware 1000 DC FW-IOB-D-120VC FW-IOB-Q-230VAC System is equipped with (circle one):	Telephone Number:		E-mail:		
mpany: Contractor Number: taller Address: Installer City, State, Zip: taller E-mail: Installer City, State, Zip: stem Installer City, State, Zip: tem Install/Commission Date: Purchase Date: d by: Purchase Date: d by: Purchase Date: d by: Purchase Date: mase circle type of application: AC Coupled Off-Grid Grid-Interactive AC Coupled Backup Mobile mase circle installed components: Xware Enclosures and Mounting Components Xware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC Xware 500 AC FLEXware PV 8 Stware 500 DC FLEXware PV 12 Xware 1000 AC FW-IOB-D-120/240VAC Xware 1000 AC FW-IOB-D-120VC Stware 1000 DC FW-IOB-D-230VAC System is equipped with (circle one): -x240 PSX-240 PSX-240 PSX-240-Relay	Installer				
taller Address: Installer City, State, Zip: taller E-mail: Install/Commission Date: tem Install/Commission Date: Purchase Date: d by: Purchase Date: d by: Purchase Date: ase circle type of application: Off-Grid Grid-Interactive AC Coupled Backup Mobile ase circle installed components: Xware Enclosures and Mounting Components IOB Kits Xware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC Xware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC Xware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC Xware 1000 AC FW-IOB AD-120VC FW-IOB-Q-230VAC Xware 1000 DC FW-IOB AD-230VAC X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: inc. Deduct Participe Deputation Description of Quartering and Participe Deputation Installer City, State, Zip: Action of Quartering Deputation Installer City, State, Zip: Install	Company:		Contractor Number:		
tailler E-mail:	Installer Address:		Installer City, State, Zip:		
stem tem Install/Commission Date: tem Install/Commission Date: d by:	Installer E-mail:				
d by:	System	2.			
ase circle type of application: Off-Grid Grid-Interactive AC Coupled Backup Mobile ase circle installed components: EXware Enclosures and Mounting Components IOB Kits EXware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC EXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-D-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-D-230VA	Sold by:		Purchase Date:		
Off-Grid Grid-Interactive AC Coupled Backup Mobile Rase circle installed components: SXware Enclosures and Mounting Components IOB Kits SXware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC SXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC SXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC SXware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC Sxware 1000 DC FW-IOB-D-230VAC FW-IOB-Q-230VAC System is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC System is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC System is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC <td>Please circle type of applicat</td> <td>ion:</td> <td></td> <td></td> <td></td>	Please circle type of applicat	ion:			
Asse circle installed components: EXware Enclosures and Mounting Components IOB Kits EXware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC EXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB D-120VC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-120VC FW-IOB-Q-230VAC Expstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-Q-230VAC expstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-Q-230VAC expstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC expstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC expstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC	Off-Grid G	irid-Interactive	AC Coupled	Backup	Mobile
EXware Enclosures and Mounting Components IOB Kits EXware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC EXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB D-120VC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-Q-230VAC Exystem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC e system is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC	Please circle installed compo	onents:			
EXware 250 FLEXware MP FW-IOB-S-120VAC FW-IOB-T-120/208VAC EXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB -D-120VC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-Q-230VAC Exware 1000 DC FW-IOB-D-230VAC FW-IOB-Q-230VAC Exstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-Q-230VAC Exstem is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC Exsten is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC Exsten is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC Exsten is equipped with (circle one): FW-IOB-D-230VAC FW-IOB-D-230VAC	FLEXware Enclosures and Mo	unting Components	IOB Kits		
EXware 500 AC FLEXware PV 8 FW-IOB-S-230VAC FW-IOB-T-230/400VAC EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC EXware 1000 DC FW-IOB-D-230VAC Exystem is equipped with (circle one): -X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: If the product Party of OutPark Parket Surfaces of OutPark Parket Surfaces of OutPark Parket Surfaces on Value	FLEXware 250 FLEXw	vare MP	FW-IOB-S-120VAC	FW-IOB-T-120/208VAC	
EXware 500 DC FLEXware PV 12 FW-IOB-D-120/240VAC FW-IOB-Q-120/240VAC EXware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC EXware 1000 DC FW-IOB-D-230VAC Exystem is equipped with (circle one): -X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision:	FLEXware 500 AC FLEXw	vare PV 8	FW-IOB-S-230VAC	FW-IOB-T-230/400VAC	
EXware 1000 AC FW-IOB-D-120VC FW-IOB-Q-230VAC EXware 1000 DC FW-IOB-D-230VAC Exystem is equipped with (circle one): -X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: If the product Party tion Product Factures Party tion of OutPack Party Surfaces on Victor	FLEXware 500 DC FLEXw	vare PV 12	FW-IOB-D-120/240VAC	FW-IOB-Q-120/240VAC	
EXware 1000 DC FW-IOB-D-230VAC e system is equipped with (circle one): -X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: iso Product Population Product Contures Product Contents of OutBack Population (Circle Data Population (Circle Da	FLEXware 1000 AC		FW-IOB-D-120VC	FW-IOB-Q-	230VAC
e system is equipped with (circle one): -X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision:	FLEXware 1000 DC		FW-IOB-D-230VAC		
-X240 PSX-240 PSX-240-Relay ase circle the three most important factors affecting your purchase decision: iso Product Paputation Product Factures Paputation of OutPack Paputation (Volume	The system is equipped with	(circle one):			
ase circle the three most important factors affecting your purchase decision:	FW-X240 PSX-240 PS>	K-240-Relay			
ica Draduct Daputation Draduct Easturas Daputation of OutDack Dapuer Sustance Vision	Please circle the three most i	mportant factors affect	ing your purchase decisi	on:	
ice • Froduct Reputation • Froduct Features • Reputation of OutBack Power systems • Value	Price Product Reputation	• Product Features	Reputation of OutBack	Power System	s • Value
m interested in receiving information concerning OutBack Power Systems products and	l am interested in receivin	g information concer	ning OutBack Power S	vstems proc	lucts and
ents (circle one):	events (circle one):	,	y	,	
Yes No	Yes No				

Corporate Office 19009 62nd Avenue NE Arlington, WA USA (+1) 360-435-6030 European Sales Office C/ Castelló, 17 08830 - Sant Boi de Llobregat BARCELONA, España +34.93.654.9568

www.outbackpower.com

900-0076-01-00 REV C