OutBack EXTREME™

RUGGED INVERTER/CHARGER

OBX-IC2024P-230/50

Installation Manual

Mounting and Installation

Warranty Introduction

Dear OutBack Customer,
Thank you for your purchase of OutBack products. We make every effort to assure our power conversion products will give you long and reliable service for your renewable energy system.

As with any manufactured device, repairs might be needed due to damage, inappropriate use, or unintentional defect. Please note the following guidelines regarding warranty service of OutBack products:

- Any and all warranty repairs must conform to the terms of the warranty.
- All OutBack equipment must be installed according to their accompanying instructions and manuals with specified over-current protection in order to maintain their warranties.
- The customer must return the component(s) to OutBack, securely packaged, properly addressed, and shipping paid. We recommend insuring your package when shipping. Packages that are not securely packaged can sustain additional damage not covered by the warranty or can void warranty repairs.
- There is no allowance or reimbursement for an installer's or user's labor or travel time required to disconnect, service, or reinstall the damaged component(s).
- OutBack will ship the repaired or replacement component(s) prepaid to addresses in the continental United States, where applicable. Shipments outside the U.S. will be sent freight collect.
- In the event of a product malfunction, OutBack cannot bear any responsibility for consequential losses, expenses, or damage to other components.
- Please read the full warranty at the end of this manual for more information.

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

 Date and Revision: June 2008 REV A

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.

Contact Information

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www.outbackpower.com

TABLE OF CONTENTS

Welcome to the OutBack Extreme Series Inverter/Charger (OBX-IC) System

The OutBack Extreme Inverter/Charger offers a complete power conversion system—DC to AC, battery charging, and an internal AC transfer relay—and can be used as a stand-alone or back-up application. It is designed for indoor or enclosed locations.

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. Please read all of the following instructions and the instructions that come with any OutBack Extreme components that make up your power system.

The *OutBack Extreme Inverter/Charger Installation Manual* covers the following:

- Safety
- Parts, standard and optional
- Initial inspection of the OBX-IC
- Preparing the mounting surface
- Fastening the OBX-IC to the mounting surface
- General electrical information

OutBack Extreme Inverter/Charger Model

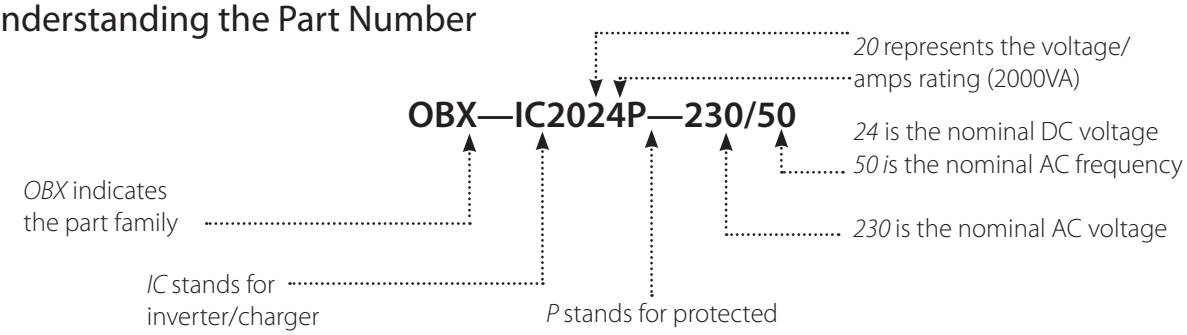
- OBX-IC2024P-230/50
  - 2000VA/24VDC
  - 230VAC/50Hz
  - 30 amp AC internal transfer relay
  - Weather-protected unit

Parts Included

- One OutBack Extreme Series Inverter/Charger
- One "WARNING ELECTRICAL SHOCK" sticker to place on the exterior of the OBX-IC
- One packet of silicone grease to protect CAT5 cable connections
- One installation manual
- External cooling fan

NOTE: Due to the variety of installation options available to a user, mounting hardware is not included. Any chosen fasteners must be adequate to support the weight of the OBX-IC and no fewer than four fasteners, one per corner, should be used for a safe installation.

Understanding the Part Number



Dimensions

- Each OBX-IC measures 20.95 cm x 41.27 cm x 33.02 cm (8.25" x 16.25" x 13").
- Depending on the model, an OBX-IC weighs between 25.4 kg (56 lbs) and 28.39 kg (62.6 lbs).

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Required Conductors

- Each installation differs, including distances between the OBX-IC and the AC and DC components it connects to. For this reason, we do not supply conductors.
- Use 9.26 mm or .3648" (2/0 AWG), . 11.7 mm or .4600" (4/0 AWG), or larger approved cables rated 75^0 C or higher for DC wiring
- Use 2.60 mm or .1019" (#10 AWG) or larger approved cables rated 75^0 C or higher for AC wiring

Environmental Concerns

In the event an OutBack Extreme Inverter/Charger needs to be disposed of, its aluminum casing is easily recyclable as are any stripped out internal metal and plastic parts. All circuit boards and electronic components should be disposed or recycled in accordance with local environmental laws.

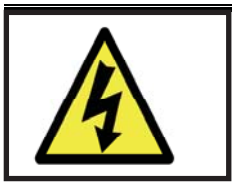
Maintenance

- Periodically check that the battery cable lugs are tight and secure according to the recommended torque settings (13.6 Nm/10-foot pounds).
- Brush off excessive dust from the inverter/charger as needed.
- Check that fasteners securing the inverter/charger to its mounting surface are tight.
- If the inverter/charger is not inverting:
  - Verify the DC battery voltage at the inverter/charger terminals
  - Verify a lack of AC output at the inverter/charger terminals
  - Call OutBack Technical Support for further assistance.

Storage

Store each inverter/charger unit in a cool, dry area.

READ FIRST!



IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

Read all instructions and cautionary markings on the OBX-IC, the batteries and all appropriate sections of this installation and user manual as well as other component manuals before using the system.

Be cautious around electricity, electrical components, and batteries. Shocks, burns, injury, and even death can occur if an installer comes in contact with electricity.

Install all components and wiring according to applicable codes.

OutBack Power Systems cannot be responsible for system failure, damages, or injury resulting from improper installation of their products.

Use only the recommended DC and AC wire sizes or greater. Be sure all wires are in good condition.

Install the OBX-IC in a dry location, preferably indoors.

- Install the OBX-IC in a shaded area out of direct sun light for best operation.
- For installations where the OBX-IC may be exposed to water spray, it should be mounted either with the base down (shelf mounting) or with the AC wiring compartment facing down (wall mounting).
- If mounted with the base down, water cannot be allowed to accumulate around the OBX-IC's base. There is a drainage system on the base of the OBX-IC to dispel condensation. If submerged, water can enter this drain and cause failure.

INITIAL INSPECTION

Your OBX-IC is stoutly packaged for secure shipping. Please inspect the packaging and component for damage prior to installation. Retain this packaging in the unlikely event your OBX-IC is ever returned to OutBack for servicing (see page 29).

NOTE: Remember that charged batteries are a constant power source and any contact with the battery terminals can lead to an injury.

WARNING: WORKING NEAR LEAD ACID BATTERIES CAN BE DANGEROUS.
BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION.

Design the battery enclosure to prevent accumulation and concentration of hydrogen gas in "pockets" at the top of the enclosure. Vent the battery compartment from the highest point to the outside. A sloped lid can also be used to direct the flow of hydrogen to the vent opening.

CAUTION

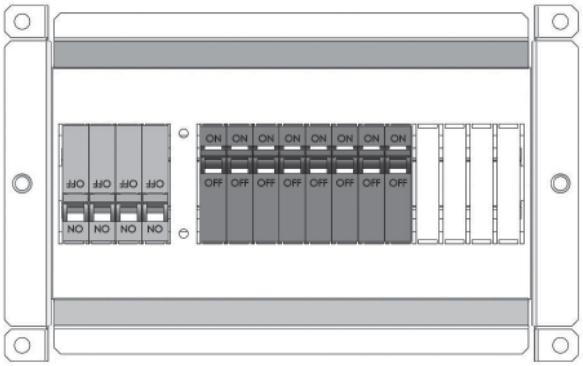
To reduce risk of injury, charge only deep-cycle lead acid, lead antimony, lead calcium, gel cell or absorbed glass mat type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage. Never charge a frozen battery.

PERSONAL PRECAUTIONS

- Someone should be within range of your voice to come to your aid if needed.
- Keep plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- Wear complete eye protection. Avoid touching eyes while working near batteries. Wash your hands with soap and warm water when done.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters an eye, flood the eye with cool running water at once for at least 15 minutes and get medical attention immediately following.
- Baking soda neutralizes lead acid battery electrolyte. Keep a supply on hand in the area of the batteries.
- NEVER smoke or allow a spark or flame in vicinity of a battery or generator.
- Be extra cautious to reduce the risk of dropping a metal tool onto batteries. It could short-circuit the batteries or other electrical parts which can result in fire or explosion.
- Remove personal metal items such as rings, bracelets, metal ID tags, necklaces, and watches when working with a battery or other electrical current. A battery can produce a short circuit current high enough to weld a ring or the like to metal, causing severe burns.

SYSTEM PROTECTION

Electrical systems are designed to protect you, the wires, the components, and the devices served by the system.



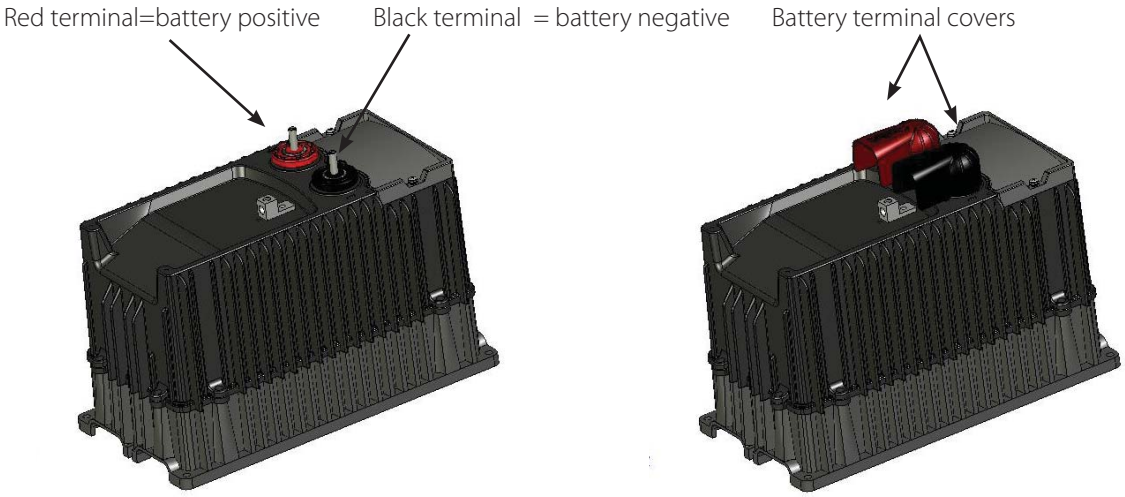
Each OBX-IC must be part of a permanently grounded electrical system (see page 9). Grounding protects people and equipment from electrical shock. Grounding must be done according to local and national electrical codes.

OutBack circuit breakers—rated at 100% duty cycle— protect wiring by limiting the amount of current entering a system. All wired electrical systems require circuit breakers or fuses for protection.

OutBack offers both breakers and fuses for over-current protection. If they are provided by other vendors, they must be properly rated.

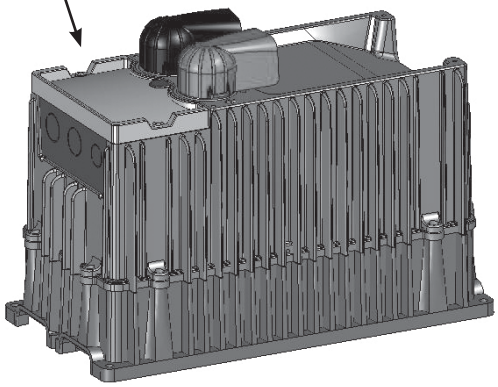
DC WIRING ORIGINATION

Each OBX-IC has two DC brass battery terminals (+ and -) with 8M x 1.00 stainless steel threaded studs.

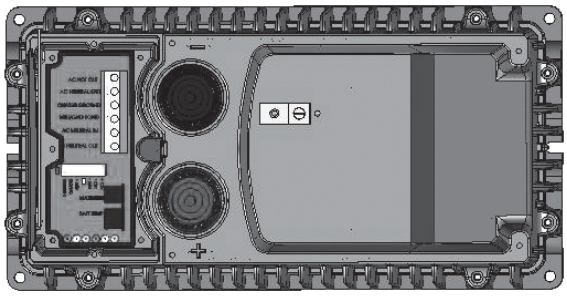


AC WIRING ORIGINATION

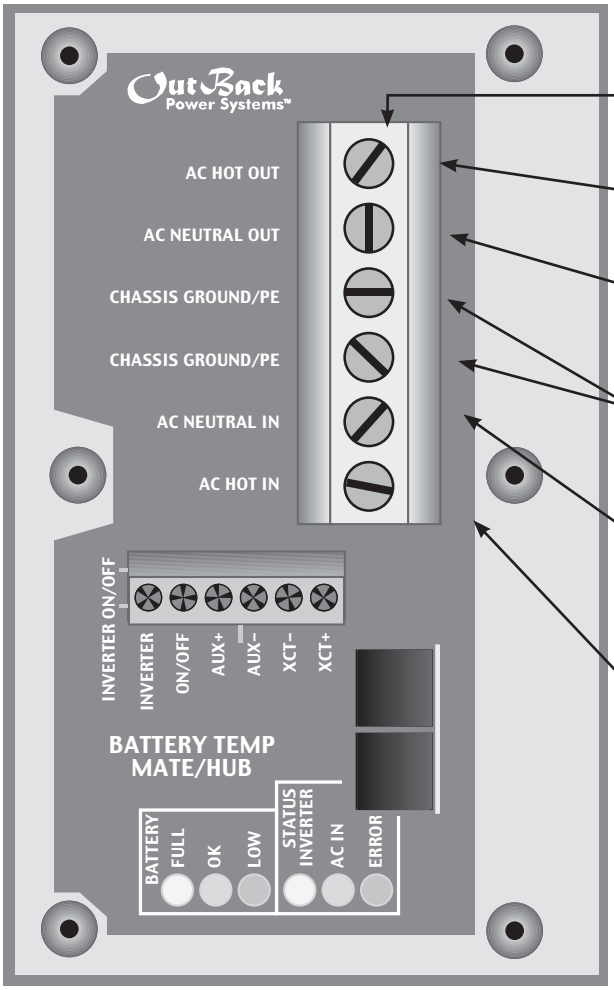
Lexan cover protects AC Wiring Compartment Board



AC Wiring Board



AC WIRING COMPARTMENT BOARD



AC Terminal Block secures AC connections to the OBX-IC using set screws.

AC HOT (PHASE) OUT supplies power to the loads.

AC NEUTRAL OUT acts as neutral leg for loads supplied by the OBX-IC and is common with the AC NEUTRAL IN.

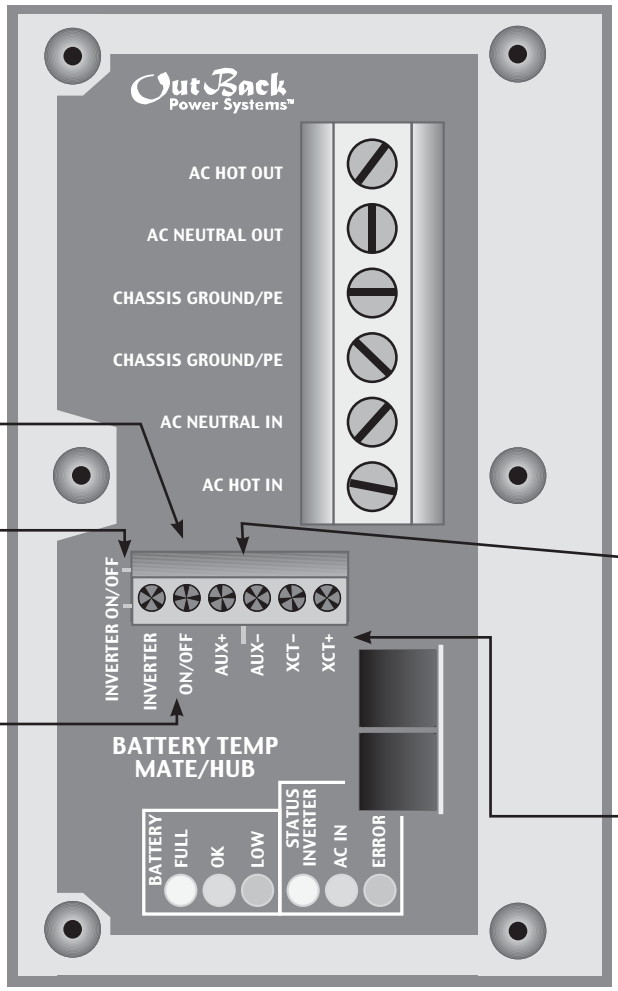
CHASSIS GROUND connections are common and act as grounds for both the incoming and outgoing AC circuits.

AC NEUTRAL IN acts as the neutral leg for AC power supplied by a generator to the OBX-IC and is common with the AC NEUTRAL OUT.

AC HOT (PHASE) IN connects incoming AC from a generator to the OBX-IC through an internal AC transfer relay relay. This AC is used to run loads and recharge batteries.

NOTE: 4.11 mm (6 AWG) is the largest wire size the AC Wiring Compartment Board can accommodate.

LOW VOLTAGE TERMINALS



Control Terminal Wiring Block

Jumper

INVERTER ON/OFF: Allows for manual switch to control the OBX-IC inverter function (default operation is "ON"); controlled by the MATE when the jumper is present.

NOTE: Keep Control Wiring Terminal Block screws tight and the block itself secured tightly to AC Board. Otherwise, the OBX-IC can malfunction. The Terminal Block can be unplugged for easier wire installation and removal/reinstallation of the OBX-IC.

AUX OUTPUT (AUX+/AUX-): 12VDC at 0.7 amps (8.4 watts) maximum is available at these terminals; the AUX's default is to drive cooling fans or the Turbo Fan.

XCT+/XCT- are non-operational terminals (do not connect).

AC AND DC GROUNDING REQUIREMENTS

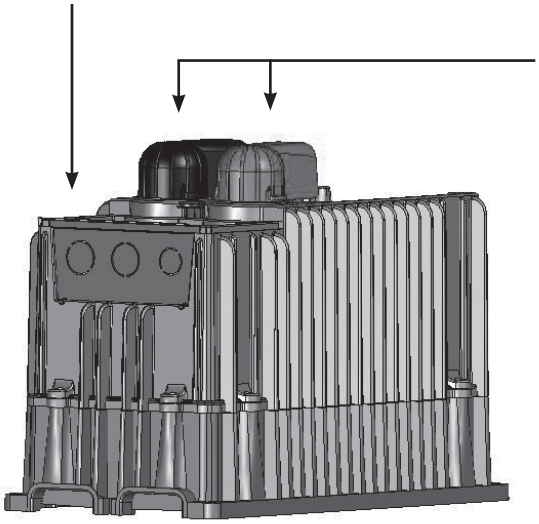
- Connect only to a grounded, permanent wiring system.
- Some generators have their own neutral ground connection. If a generator is used, its neutral-ground connection will need to be disengaged for proper system operation.
- For all installations, the negative battery conductor should be bonded to the grounding system at one (and only one) point in the system.
- OutBack products are not designed for use in a positive grounded system. Please contact OutBack Technical Support for further information.

The equipment ground on each is marked with this symbol: 

OBX-IC PARTS AND ACCESSORIES

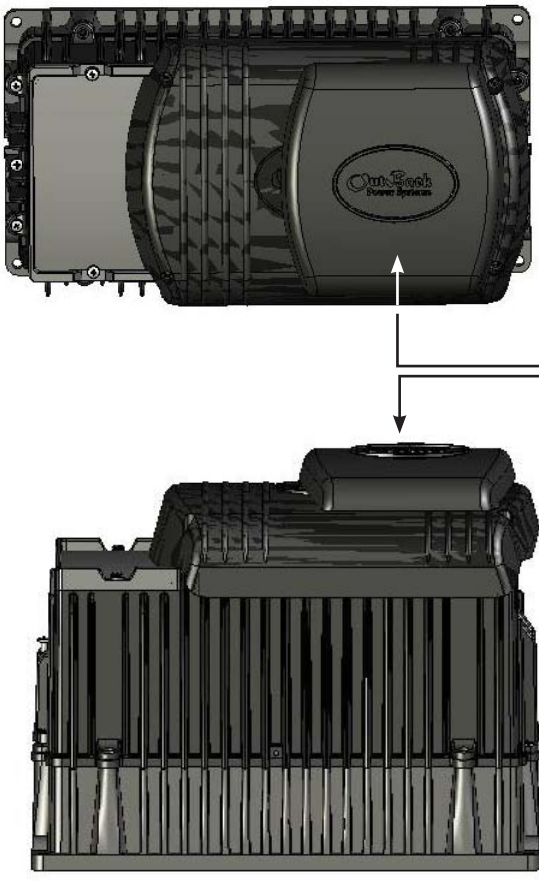
AC CONDUIT PLATE*

* AC conduit connects to the AC Conduit Plate for installations.

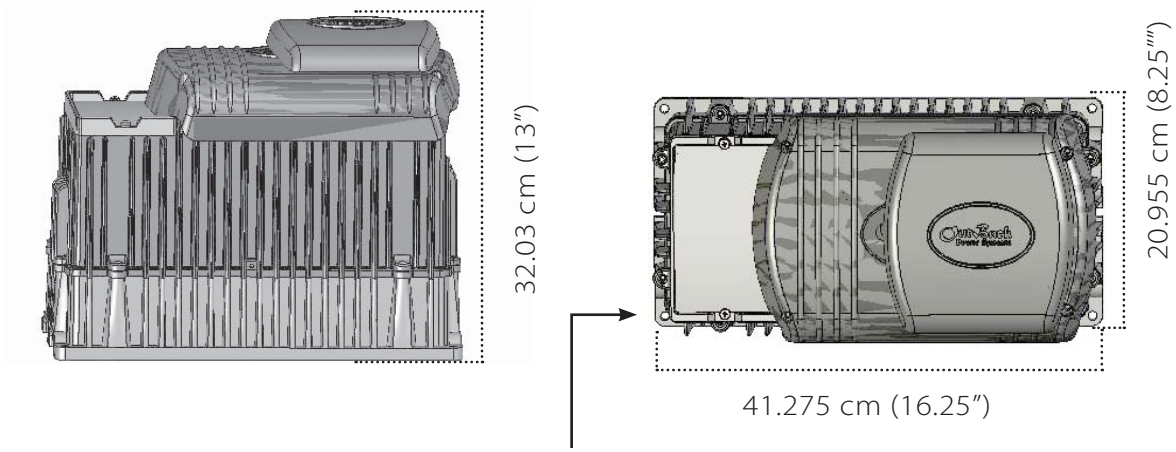


BATTERY TERMINAL COVERS

- The caps are made of stiff plastic with a snap-on design; remove them carefully using a flat-blade screwdriver inserted into the slots on the sides of each cover.
- DC conduit may be required for exposed installations.
- Always keep the battery terminal covers installed.



TURBO FAN COVER



- Insert appropriate fasteners at all four corners of the OBX-IC for a secure installation.
- Weight is approximately 25.40 kg (56 lbs)

MOUNTING

- The OBX-IC Series Inverter/Charger is approved for indoor or enclosed protected mounting only.
- An OBX-IC weighs approximately 25.40 kg (56 lbs) and must be secured with appropriate fasteners to a sturdy mounting surface capable of supporting its weight. It is easier for two people to install the OBX-IC due to its weight.
- OutBack OBX-ICs can be mounted in any position, but they perform better in locations offering plenty of air circulation.
- If mounting the OBX-IC on other surfaces such as plywood, wall studs, or masonry, use appropriate fasteners to support approximately its weight. OutBack cannot be responsible for damage to the OBX-IC if it is attached with inadequate fasteners.
- Install and secure each OBX-IC before attaching any wiring.

WIRE CONNECTIONS

NOTE: A system's individual voltage requirements (230VAC phase to neutral or 230Y/400VAC 3-phase) as well as how each OBX-IC is to function all determine how the OBX-ICs are wired.

AC

Follow these steps to wire the OBX-IC to your system:

1. Shut all AC breakers off or remove any fuses before connecting any wiring.
2. Shut off all DC breakers, including the PV breakers.
3. With all power off, run lengths of 13.3 mm^2 (6 AWG) wire between the AC Wiring Compartment Board AC out terminals and sufficient over current protection via an AC circuit breaker whose ampacity matches or exceeds the maximum AC input current of the OBX-IC model used in the system (see OBX-IC product specifications). The breaker should be installed inside of a metal chassis such as an existing panel.
4. With the over current protection connected, run lengths of 13.3 mm^2 (6AWG) wire between the AC Wiring Compartment Board AC IN terminals and the AC input breaker. The breaker should be installed inside of a metal chassis such as an existing panel. The AC input hot conductor must be supplied through an AC branch-rated circuit breaker. whose ampacity matches or exceeds the maximum AC input current of the OBX-IC model used in the system (see OBX-IC product specifications).

DC

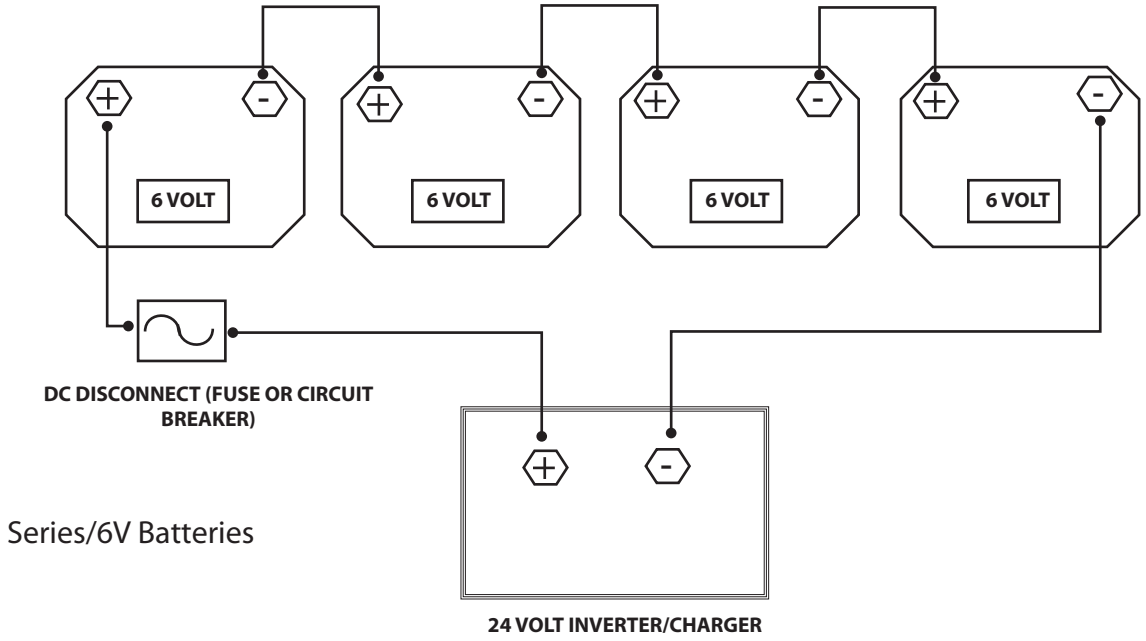
- Use crimped and sealed copper ring terminal lugs with 8 mm (5/16") hole or compression-type lug to connect battery cables to DC terminals. Soldered cable lugs are also acceptable.
- Use recommended cable sizes (see page 26) to reduce losses and ensure high performance of the OBX-IC (smaller cables can reduce performance and possibly damage the unit).
- Keep cables together (e.g., using a tie-wrap) as much as possible.
- Ensure cables pass through the same knockout and conduit fittings to allow inductive currents to cancel.

TORQUE REQUIREMENTS

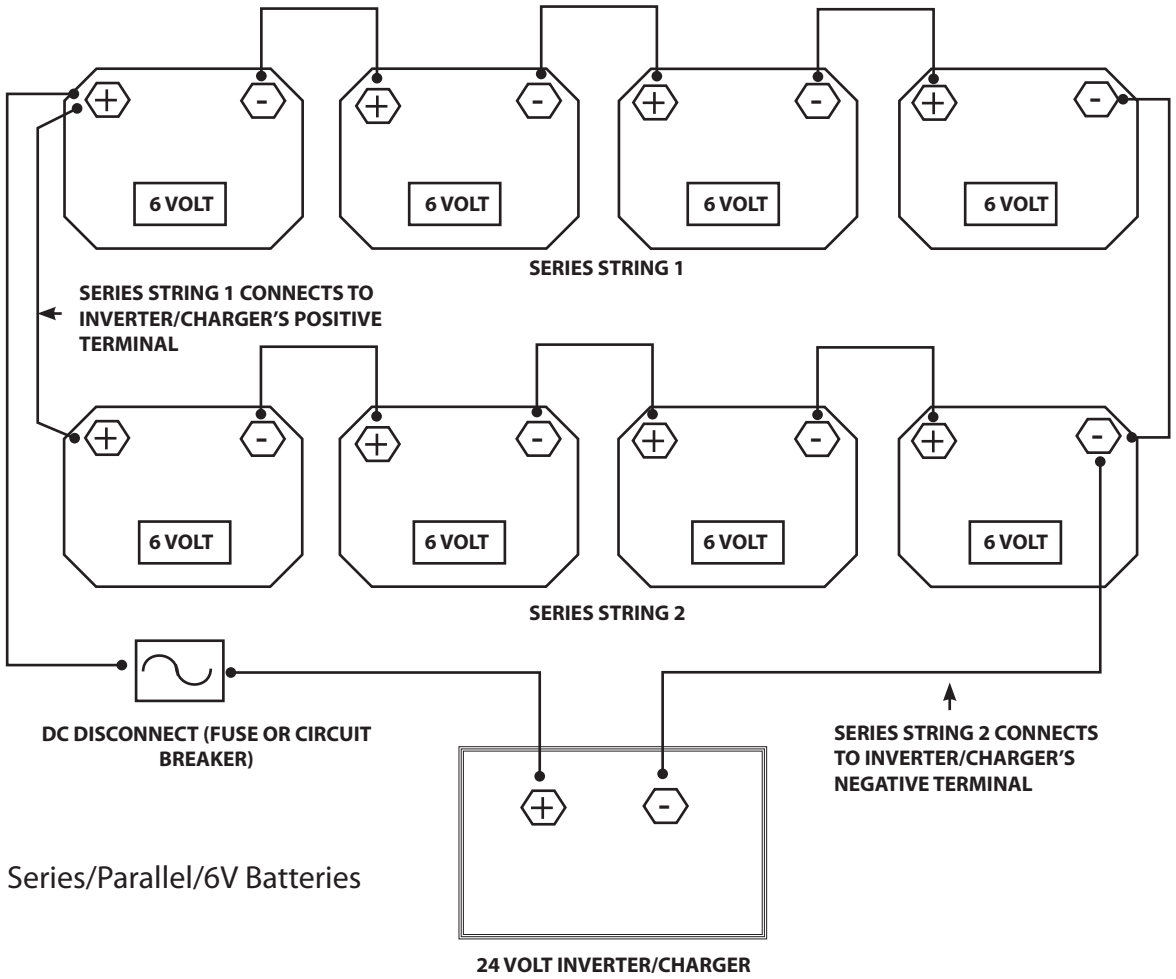
CONNECTION	TORQUE IN POUND MEASURES
AC and PV breakers	2.3 Nm (20 inch-lbs)
DC shunt	20.4 Nm (15 foot-lbs)
DC battery connections	13.6 Nm (10 foot-lbs)
OBX-IC's DC Terminals	13.6 Nm (10 foot-lbs)
OBX-IC's AC Terminals	3.38 Nm (30 inch-lbs)

Table 1 Torque Values for Installation

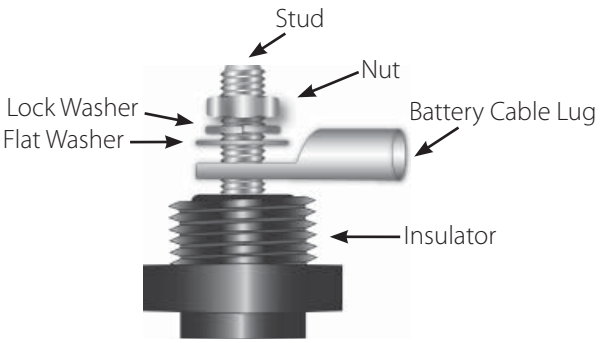
Battery Wiring Examples



Series/6V Batteries



Series/Parallel/6V Batteries



- Never install extra washers between the terminal mounting surface and the battery cable lug—the connection must be direct and secure.
- Always install breakers or fuses within the positive battery cable.
- Torque the battery cable lugs to 13.6Nm/10-foot pounds.

AC WIRING NOTES

AC HOT (PHASE) OUT

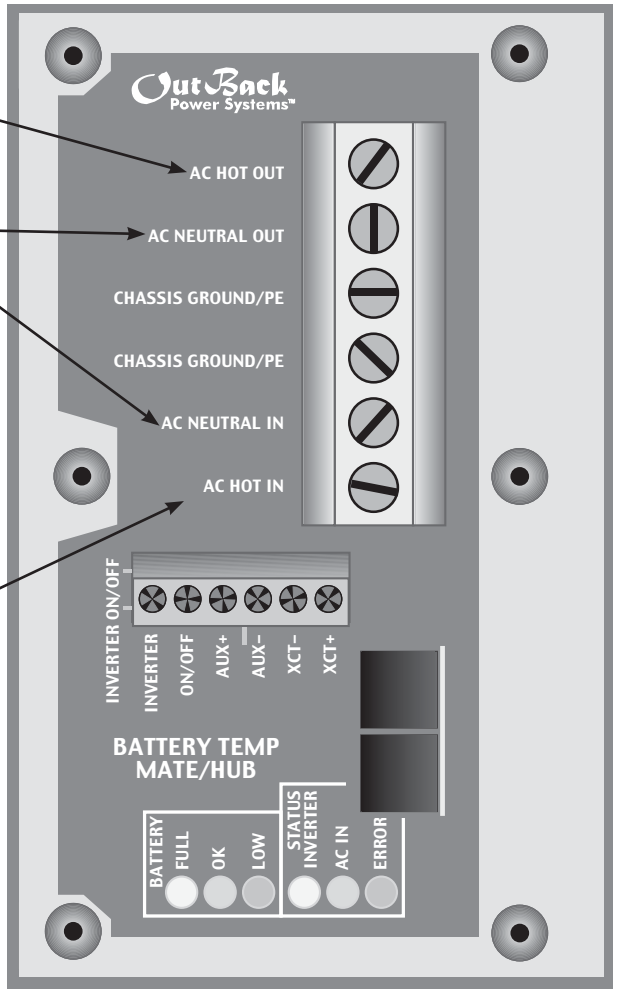
- Supplies the AC hot output conductors through a 30 amp maximum AC branch rated circuit breaker using 13.3 mm^2 (6 AWG) wire and connect to the AC

AC NEUTRAL OUT/AC NEUTRAL IN

- Connects the AC neutral input conductor to the AC NEUTRAL IN terminal.
- Connects the AC neutral output conductor to the AC NEUTRAL OUT terminal.

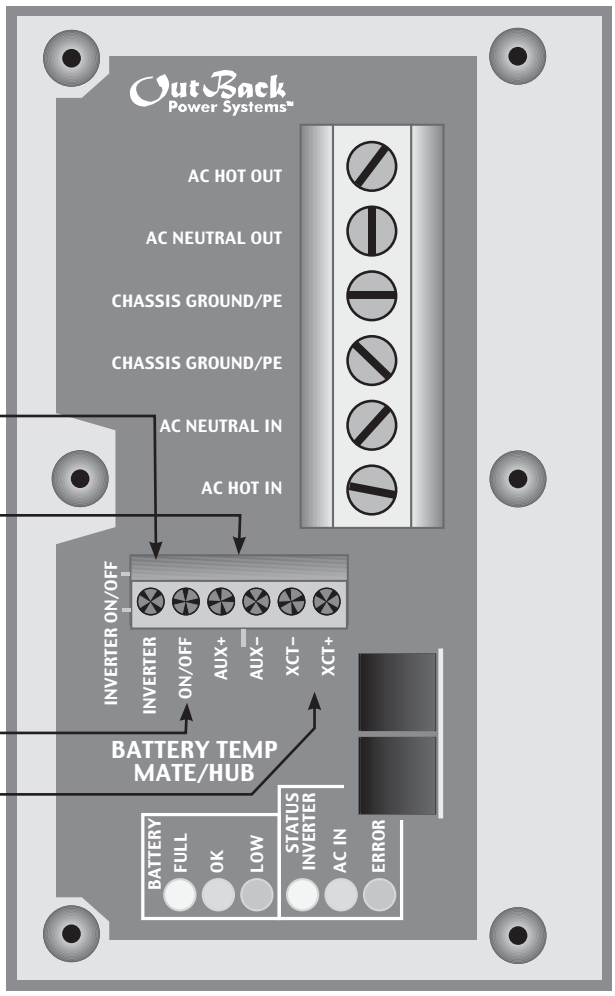
AC HOT (PHASE) IN

- The AC hot input conductor (brown) must be supplied through a 30 amp maximum AC branch rated circuit breaker and connected to the AC HOT IN.
- 13.3 mm^2 (6 AWG) wire is required for the OBX-IC's AC transfer relay.



LOW-VOLTAGE WIRING

This six-position terminal block can be unplugged to make wiring easier and to simplify the removal and reinstallation of an OBX-IC. It must be securely and completely plugged in for proper OBX-IC functioning.



Control Wiring Terminal Block

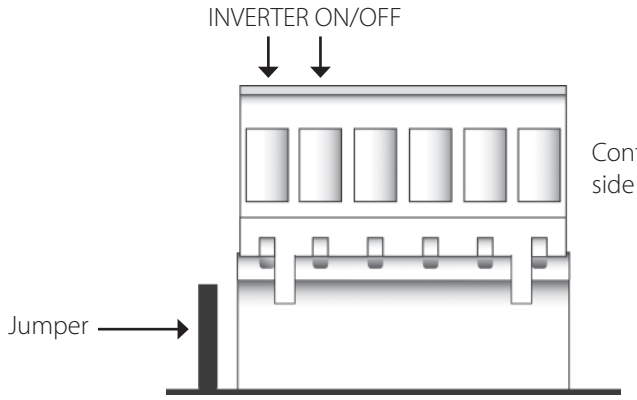
12 VDC at 0.7 amps (8.4 w) is available at the AUX+/AUX- terminals

A switch can be wired to the INVERTER and ON/OFF terminals to manually control the OBX-IC

XCT+/XCT- are not operational

INVERTER and ON/OFF

- Replacing the pre-installed jumper connecting the ON/OFF terminals with a switch allows manual control of the OBX-IC.
- Without an ON/OFF switch, the inverter(s) will always be ON due to a factory-installed, removable jumper.
- Cycling the switch again returns the inverter to the ON mode.



Control Wiring Terminal Block, side view

Prior to installing an ON/OFF switch, if the OBX-IC's AC output is off, check that the jumper is present and well-connected before installing a switch. You want to confirm the system is in good working order. Suggested switches include push on/push off style.

AUXILIARY OUTPUT (AUX + / AUX -)

The Auxiliary output system uses the AUX + and AUX – terminals. These terminals drive the OutBack OBX-IC Turbo Kit or DC12-FAN fan for external cooling.

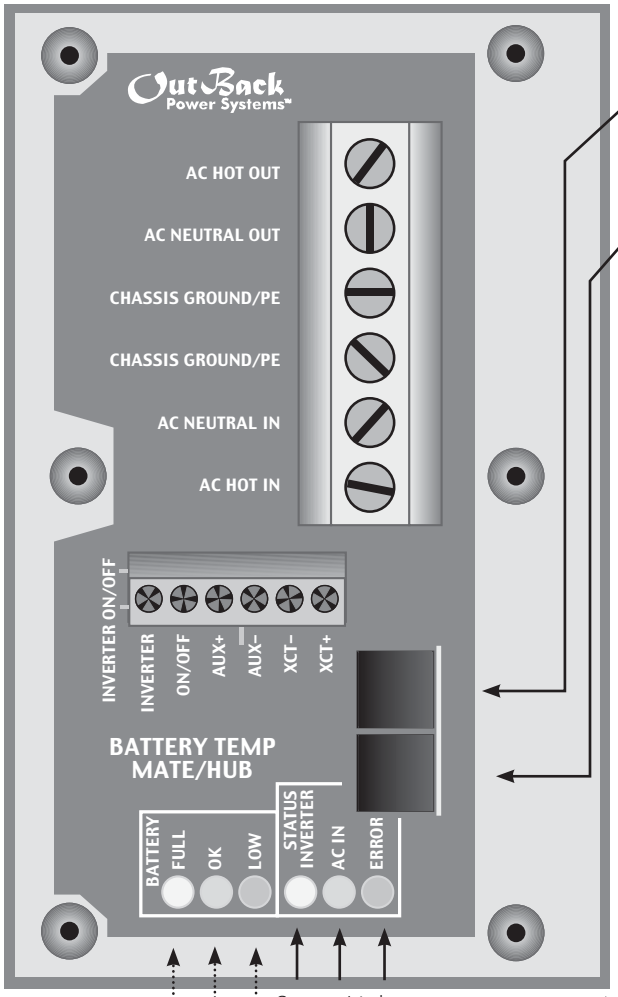
NOTE: These terminals should not be connected to any type of DC load greater than .7 amps.

- The OBX-IC includes internal electronic over-current protection for the AUX 12 VDC output circuit which auto resets if it is short-circuited. No additional fuses are required.

XCT + / XCT -

These terminals are not operational at this time.

PORTS AND INDICATORS



RJ-11 modular jack connects the RTS, the external battery temperature sensor.

RJ-45 jack is used for external communications.

LED Color	LED Action	LED indicates
GREEN	GREEN	Inverer ON
	Flashing GREEN	Search mode or Slave power
	Off	Inverter OFF
YELLOW	Solid YELLOW	AC source is connected
	Flashing YELLOW	AC input live, waiting to connect to OBX-IC
	Off	No AC input present
RED	Solid RED	Fatal Error, contact OutBack Power Systems
	Flashing RED	Warning, a non-critical error has occurred

LED Color		24 VDC
GREEN	(FULL)	25.0 or higher
YELLOW	(OK)	23.0 to 25.0
RED	(LOW)	23.0 or lower

WARN(ING) Screens

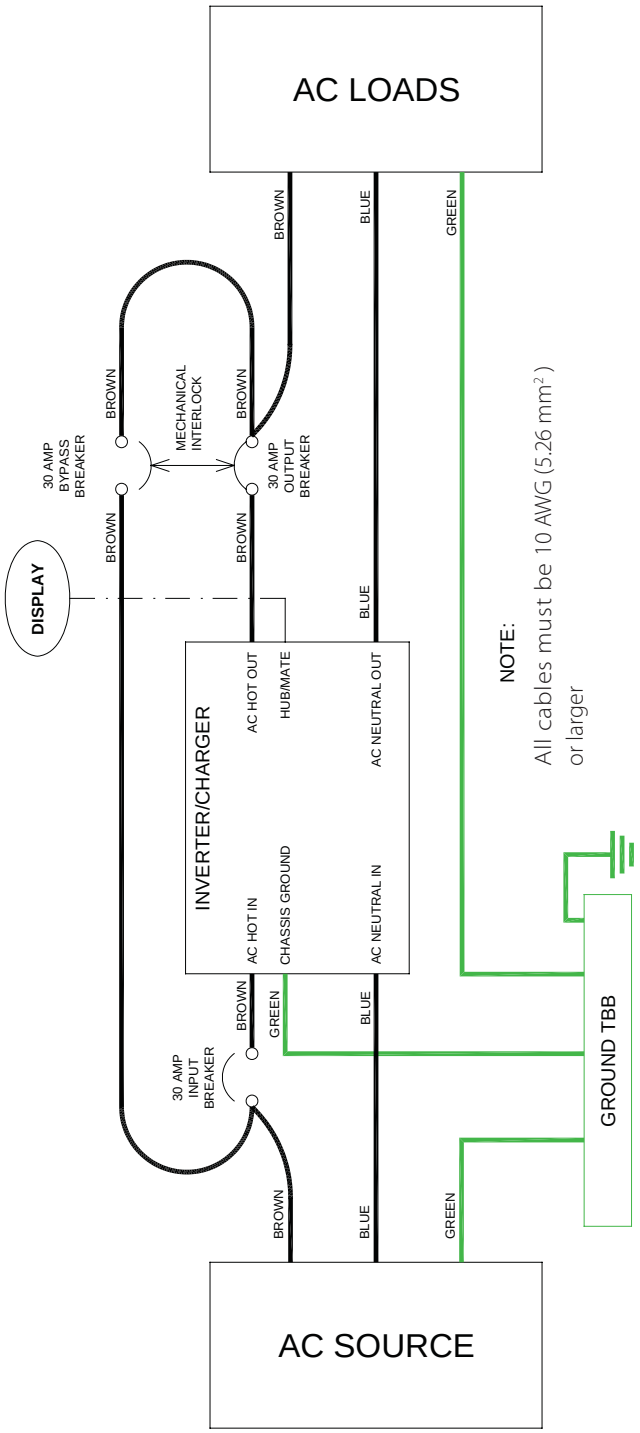
- *acin freq too high*: AC source is above 56 Hz (upper limit) and will be dropped if frequency gets much higher
- *acin freq too low*: AC source is under 44 Hz (lower limit) and will be dropped if frequency gets much lower
- *acin voltage too high*: AC source's voltage is over 300 VAC (default limit) and risks loss of FX connection
- *acin voltage too low*: AC source's voltage is under 80 VAC (default limit) and risks loss of FX connection
- *acin input current exceeds max*: AC loads are drawing more current than the rating of the FX allows
- *temperature sensor fault*: an internal FX temperature sensor is malfunctioning
- *internal comm. error detected*: there is a communication problem between the MATE and the FX
- *internal fan failure detected*: the FX's internal cooling fan is not operating properly
- *airtemp*: displays a numeric value representing the air temperature around the FX*
- *fettemp*: displays a numeric value representing the temperature of the FETs (Field Effect Transistors)*
- *captemp*: displays a numeric value representing the temperature of the ripple capacitors*

*These values are used for troubleshooting purposes. The higher the numerical value, the cooler the temperature.

SAMPLE INSTALLATIONS

SINGLE OBX-IC SYSTEM

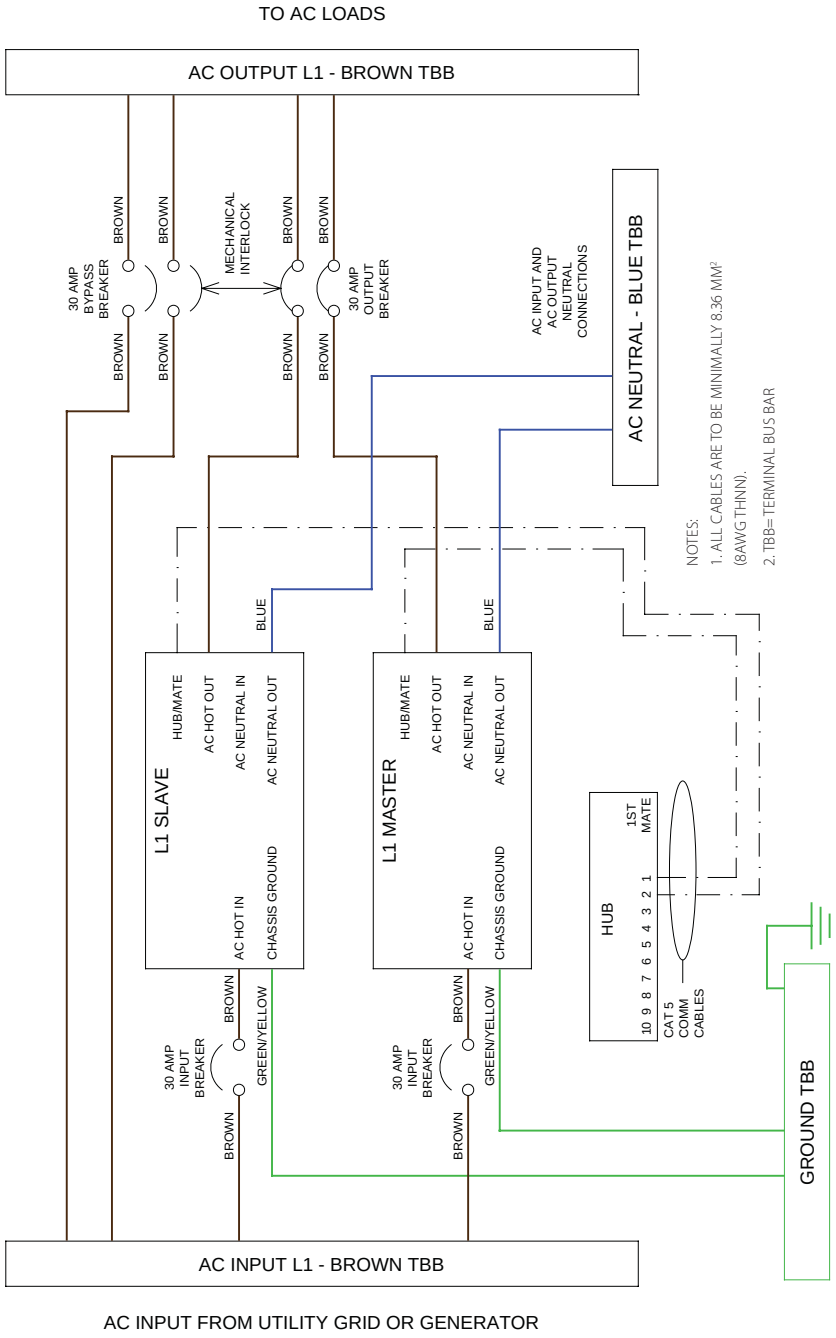
- All OBX-IC AC wiring must handle 30 amps AC or more.
- A 30A input breaker (maximum) must be used.
- A single OBX-IC can continuously power two to three KW of loads depending on which model is used.



PARALLELED DUAL OBX-IC SYSTEM

- All AC wiring from the AC source and to the AC loads must collectively handle 60 amps AC or more.
- All other AC wiring capacity must equal 30 amps AC.
- A paralleled dual OBX-IC system can continuously power 4-6kW of loads depending on which model is used.

NOTE: Program the lowest-installed OBX-IC as Master (1-2ph MASTER) and the second OBX-IC as an OutBack L1 Slave (OB SLAVE L1). The Master OBX-IC must be plugged into Port 1 of the HUB.

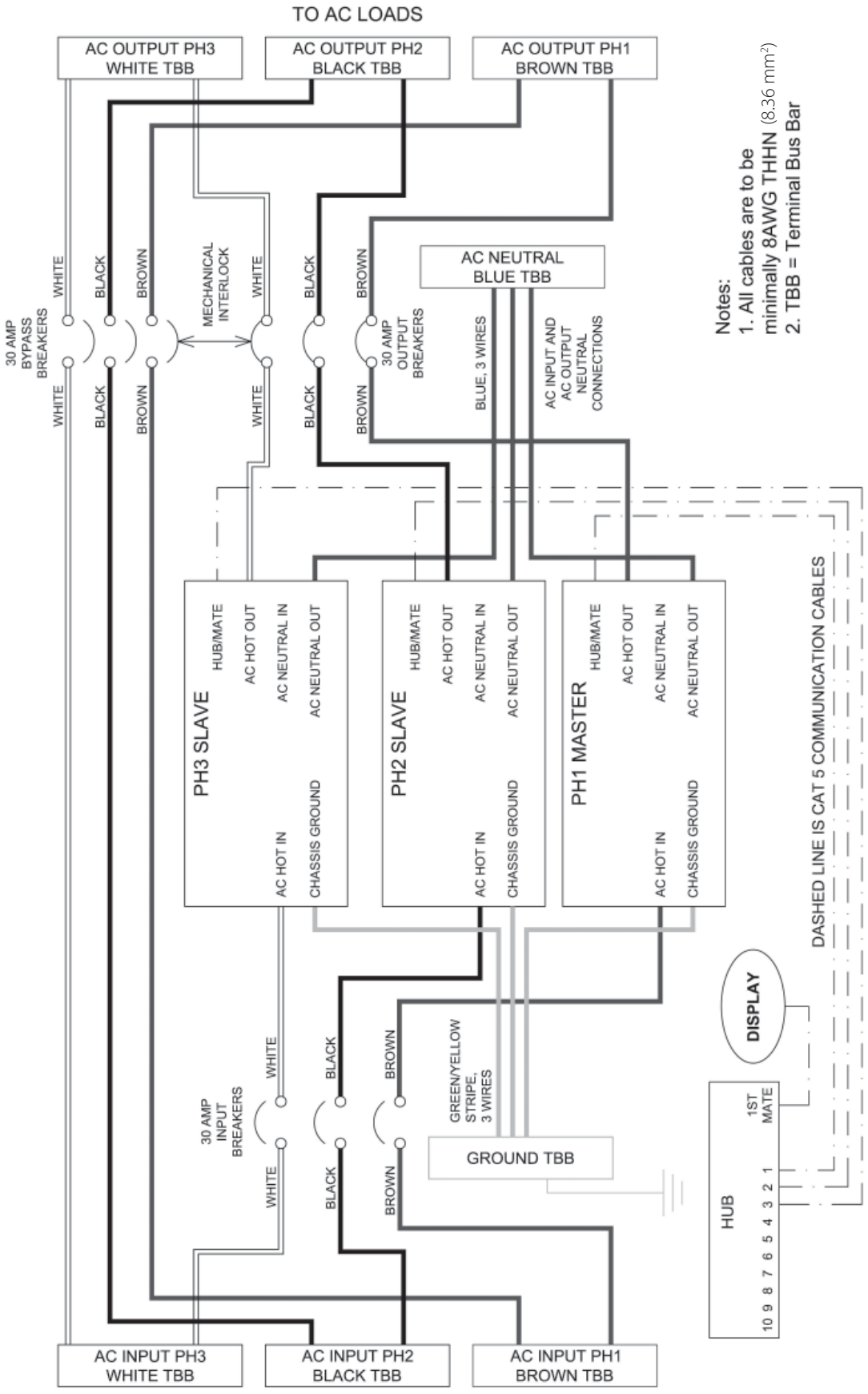


Parallel/Dual System with Two OBX-ICs

3-PHASE OBX-IC SYSTEM

- This system produces 230VAC per phase and 400VAC from phase to phase. There can only be one OBX-IC per phase on a 3-phase system for a maximum of three OBX-ICs total.
- The AC wiring from the AC source and to the AC loads must handle 30 amps AC.
- All AC wiring must handle a capacity of 30 amps AC.
- This system can power continuously up to 6-9kW of loads depending on which model is used.
- Connecting more loads than the continuous rating of the OBX-IC may cause breakers to trip or the OBX-IC to shut off its AC output.

NOTE: Keep the phases in order—phase one is connected to the OBX-IC programmed L1; phase two is connected to L2; and phase three is is connected to L3 (or phases A, B, and C to inverter/chargers A, B, and C)



Three-Phase System

INSTALLATION CHECK LIST

ITEM	*YES*	*NO*
All manuals read and reviewed?		
▶ OutBack Extreme Inverter/Charger		
System mounted with the recommended number and sized fasteners?		
System installed according to applicable codes and standards?		
System inspected?		
System permanently grounded?		
Did the installer use OutBack recommended wire type and gauge adjusted for temperature ratings and length? Are all wires torqued to their recommended values?		
▶ All AC wiring rated for 75° C or higher?		
▶ Battery cables rated 75° C or higher?		
▶ 2.59 mm(10 AWG) or larger wire used for AC HOT IN?		
▶ 2.59 mm (10 AWG) or larger wire used for AC HOT OUT?		
▶ OBX-IC connected to AC circuit with 30 amp maximum branch-circuit over-current protection?		
▶ All cables torqued to OutBack specifications?		
▶ AC and PV breakers to 2.48 Nm (22 inch-lbs)?		
▶ All DC connections to 13.6 Nm (10 foot-lbs)?		
▶ OBX-IC AC terminals to 3.38 Nm (30 inch-lbs)?		
▶ OBX-IC battery breaker to 5.07 Nm (45 inch-lbs)?		
▶ All terminal block screws torqued to 3.4 Nm (2.5 foot-lbs)?		

APPENDIX

RATINGS

OBX-IC2024P-230/50 Inverter/Charger

2.0 kWAC 24VDC 230 VAC 50 HZ

Nominal AC Output Ratings for Multiple OBX-IC Systems

Single Phase	OBX-IC2024P-230/50	230VAC/50 Hz	2.5kWAC	20.8 Amps
Split Phase	OBX-IC2024P-230/50	230/240VAC/ 50 Hz	5.0kWAC	20.8 Amps per leg
Three Phase	OBX-IC2024P-230/50	230Y400VAC/ 50Hz	7.5kWAC	20.8 Amps per phase

Nominal DC Input Voltage Range	24VDC
Nominal AC Voltage / Frequency	230VAC / 50 HZ
Continuous Power Rating at 25C Ambient	2000VA
Continuous AC RMS Output at 25°C	8.7 Amps AC
Idle Power - Full AC Output	≈ 20 Watts DC
Idle Power - Search Mode	6 Watts DC
Typical Efficiency	92%
Total Harmonic Distortion - Typical	2%
Output Voltage Regulation	± 2%
Maximum Output Current – Peak (1 mSec)	35 amps AC
Maximum Output Current - RMS (100 mSec)	25 amps AC
AC Overload Capability - Surge	5750VA
AC Overload Capability - 5 Second	4800VA
AC Overload Capability - 30 Minutes	3100VA
AC Input Current Maximum	30 Amps AC
AC Input Voltage Range	80-300VAC
AC Input Frequency Range	44-56.0 Hz
DC Input Range	21.0 to 34.0 VDC
DC Input Current – Rated Power	95 Amps DC
Maximum DC Input Current	300 Amps DC
Continuous Battery Charger Output	55 amps DC

RATINGS DETAILED

NOMINAL AC OUTPUT VOLTAGE OF AN OBX-IC2024P-230/50 SYSTEM

Single Phase	230VAC at 50 Hz
Parallel Stacked	230VAC at 50 Hz on one AC output leg
Three Phase Stacked	230VAC at 50 Hz per AC output leg (limit three) / 400VAC at 50 Hz between AC output legs

RECOMMENDED OBX-IC DC VOLTAGE RANGE

NOTE: The last two digits in the model number designate the nominal DC voltage.
Example: OBX-IC2024ET = 24V DC Voltage.

OBX-IC2024P-230/50	22 – 32 VDC

MAXIMUM DC INPUT CURRENT

NOTE: This is the maximum DC current the OBX-IC will draw from a single battery source when starting very large AC loads. It is not used for sizing the DC disconnect or selecting DC cable gauge. It is used to select the minimum reasonable battery capacity.

OBX-IC2024P-230/50	300 ADC per unit

RATED DC INPUT CURRENT

NOTE: This is the maximum continuous DC current that the OBX-IC will charge from a single battery sourcewhen charging.

OBX-IC2024P-230/50	95 ADC

AC INPUT OPERATING VOLTAGE RANGE

NOTE: This is the recommended AC input voltage range to be supplied to the OBX-IC# Voltages outside of this range may damage AC loads connected to the OBX-ICs AC output terminals.

OBX-IC2024P-230/50	160-300 VAC (VAC = volts AC)

* The AC input nominal voltage is 230VAC

MAXIMUM AC INPUT CURRENT

An AC input source connected to the OBX-IC supplies power for two separate internal AC circuits – the AC internal transfer relay and the battery charging system. The AC internal transfer relay transfers the AC input power to the AC loads. The OBX-IC's battery charger will "back off" if the total AC loads—including the charger—exceed the AC input current limit (default setting is 28 AAC). This "Input Limit" can be adjusted using the optional MATE to avoid overloading a generator or trip a circuit breaker. If your generator cannot produce 28 AAC or you are connecting to an AC input source that has a breaker that is rated for less than 30 AAC.

OBX-IC2024P-230/50	30 AAC per OBX-IC (AAC = Amps AC)

MAXIMUM CURRENT FOR BATTERY CHARGER

Due to heat constraints, the OBX-IC will limit incoming AC current to recharge the battery. The battery charger has a maximum efficiency of 85%. Other factors, such as cable losses, might reduce this efficiency.

MAXIMUM AND DEFAULT AC INPUT AND DC CHARGER (bulk stage) OUTPUT VALUES

OBX-IC2024P-230/50	AC Max = 7AAC (Default = 12AAC)	DC Max = 55ADC

AC INPUT FREQUENCY RANGE

NOTE: If the AC input source is out of the range noted below, the OBX-IC will not connect or stay connected.

OBX-IC2024P-230/50	44-56 Hz

MAXIMUM AC OUTPUT CURRENT

This is the amount of surge current that the OBX-IC will quickly supply for a split second. If the surge lasts more than one millisecond, the inverter shuts down.

OBX-IC2024P-230/50	50 AAC per OBX-IC for 1 millisecond

MAXIMUM CONTINUOUS OUTPUT POWER

An OBX-IC Series Inverter/Charger's model number indicates its maximum continuous output power. The OBX-IC2024P-230/50 has a maximum continuous output power of 2000VA (volt-amps).

OBX-IC2024P-230/50	2000 VA

MAXIMUM OVERCURRENT PROTECTION AMPACITY

This rating specifies the proper overcurrent protection ampacity.

- OBDC breakers are panel-mount circuit breakers.
- Class T DC fuses are terminal-mounted and should always be used in conjuncture with a disconnect mechanism.
- OBX-ICs should use properly sized DC circuit breakers.
- OutBack Power Systems recommends Class T fuses for marine installations where a DC disconnect is not required.

MODEL	AMPACITY	DC BREAKER	DC FUSE
OBX-IC2024P-230/50	175 amps	OBB-175-125VCD-PNL	Class T-300

WIRE SIZES

The following chart contains information on wire sizes, the DC resistance of the wires and the corresponding diameters and areas of these wires. This information can be used to calculate the voltage drop of the wires or to find an equivalent wire size.

SIZE	DC (AWG) Resistance in Ohms (1000 feet)	CROSS-SECTIONAL AREA		APPROXIMATE DIAMETER	
		INCHES	MILLIMETERS	INCHES	MILLIMETERS
14	3.14	.0032	2.08	.0641	1.63
12	1.98	.0051	3.31	.0808	2.05
10	1.24	.0082	5.26	.1019	2.59
8	0.78	.0130	8.37	.1285	3.26
6	0.50	.0206	13.30	.162	4.11
4	0.31	.0328	21.15	.2043	5.19
2	0.19	.0521	33.62	.2576	6.54
1	0.15	.0657	42.41	.2893	7.35
1/0	0.12	.0829	53.50	.325	8.25
2/0	0.10	.1045	67.43	.365	9.27
3/0	0.08	.1318	85.01	.410	10.4
4/0	0.06	.1662	107.20	.460	11.7

OBX-IC2024P-230/50 Default Values

12 VDC System	DEFAULT	MINIMUM	MAXIMUM
Float Voltage	13.6V	12V	15V
Absorb Voltage	14.4V	13V	16V
EQ Voltage	14.4V	14V	17V
ReFloat	12.5V	11V	13V
LBCO	10.5V	9V	12V
LBCI	12.5V	10V	14V
Sell RE	13V	10V	15V
Gen Alert			
Off Set Point	14V	12V	18V
On Set Point	11V	10V	14V
Load Shed Off Set Point	11V	10V	14V
Vent Fan ON Set Point	13V	10V	16V
Diversion ON Set Point	14.6V	12V	16V
Absorb Time	1.0 hours	0.0 hours	24.0 hours
EQ Time	1.0 hours	0.0 hours	24.0 hours
Float Time	1.0 hours	0.0 hours	24.0 hours
AC2/Gen Transfer Delay (Cycles for AC)	60 cycles* (*20 for Grid-Tie)	0 cycles	240 cycles
Search	6	0	50
Grid Lower Limit	208V	80V	220V
Grid Upper Limit	270V	250V	300V
Grid Connect Delay	.5 min	.2 min	15.0 min
DROP or USE	USE	N/A	N/A
Charger OFF/AUTO/ON	AUTO		
AUX Output Option	COOL FAN		
Gen Alert ON Delay	4 min	0 min	240 min
Gen Alert OFF Delay	9 min	0 min	240 min
Vent Fan OFF Delay	5 min	0 min	30 min
Gen Window Lower Limit	208V	80V	220V
Gen Upper Window Limit	270V	250V	300V
AC1/Grid Transfer Delay (Cycles of AC)	6	0	240
Set AUX Control	AUTO		
Search Pulses	8	2	20
Search Pulse Spacing (Cycles AC)	60	4	120
Stacking Phase	1 or 2 phase		
InPut Select	Master Gen		
Charge Rates			
Vented 24 & 48 VDC	9 AAC	0 AAC	10 AAC
Vented 12 VDC	6 AAC	0 AAC	7 AAC
Sealed 24 & 48 VDC	5 AAC	0 AAC	7 AAC
Sealed 12 VDC	5 AAC	0 AAC	6 AAC
Grid Input Settings			
Set AC Input Size	28 Amp	5 Amp	30 Amp
Gen Input Settings	28	2	30
Set VAC	230V	210V	240V

Correction Factor • 24VDC: Multiply 12VDC values by 2 • 32VDC: Multiply 12VDC values by 2.64 • 48VDC: Multiply 12VDC values by 4

MAINTENANCE

If damaged or malfunctioning, the OBX-IC should be repaired by a qualified user, installer, or service center following OutBack Power Systems' instructions and guidelines. Please contact your energy dealer for assistance. Incorrect repairs and/or reassembly risks malfunction, electric shock or fire.

For routine, user-approved maintenance:

- Disconnect all circuit breakers and related electrical connections before doing any cleaning or adjustments.
- Solar modules may produce hazardous voltages when exposed to light; cover them with opaque material before servicing any connected equipment or service at night.
- If a remote or automatic generator start system is used, disable the automatic starting circuit and/or disconnect the generator from its starting battery while servicing it to prevent starting while servicing.

1-Year Limited Warranty

OutBack Extreme Inverter/Chargers

OutBack Power Systems, Inc. ("OutBack") provides a one year (1) limited warranty ("Warranty") against defects in materials and workmanship for its OutBack Extreme inverter/chargers ("Product") if installed in a permanently mounted installation. The Warranty term begins ninety (90) days from the date of initial invoice.

This Warranty applies to the original OutBack Product purchaser, and is transferable only if the Product remains installed in the original use location. The warranty does not apply to any Product or Product part that has been modified or damaged by the following:

- Installation or Removal;
- Alteration or Disassembly;
- Normal Wear and Tear;
- Accident or Abuse;
- Corrosion;
- Lightning;
- Repair or service provided by an unauthorized repair facility;
- Operation contrary to manufacturer product instructions;
- Fire, Floods or Acts of God;
- Shipping or Transportation;
- Incidental or consequential damage caused by other components of the power system;
- Any product whose serial number has been altered, defaced or removed; or
- Any other event not foreseeable by OutBack.

OutBack's liability for any defective Product, or any Product part, shall be limited to the repair or replacement of the Product, at OutBack's discretion. OutBack does not warrant or guarantee workmanship performed by any person or firm installing its Products. This Warranty does not cover the costs of installation, removal, shipping (except as described below), or reinstallation of Products.

To request warranty service, you must contact OutBack Technical Services at (360) 435-6030 or support@outbackpower.com within the effective warranty period. If warranty service is required, OutBack will issue a Return Material Authorization (RMA) number. A request for an RMA number requires all of the following information:

1. Proof-of-purchase in the form of a copy of the original Product purchase invoice or receipt confirming the Product model number and serial number;
2. Description of the problem; and
3. Shipping address for the repaired or replacement equipment.

After receiving the RMA number, pack the Product(s) authorized for return, along with a copy of the original purchase invoice and warranty certificate, in the original Product shipping container(s) or packaging providing equivalent protection and mark the outside clearly with the RMA number. The sender must prepay all shipping charges, and insure the shipment, or accept the risk of loss or damage during shipment. OutBack is not responsible for shipping damage caused by improperly packaged Products, the repairs this damage might require, or the costs of these repairs. If, upon receipt of the Product, OutBack determines the Product is defective and that the defect is covered under the terms of this Warranty, OutBack will then and only then ship a repaired or replacement Product to the purchaser freight prepaid, non-expedited, using a carrier of OutBack's choice, where applicable.

Shipments to other locations will be made freight collect. The warranty period of any repaired or replacement Product is ninety (90) days from the date of shipment from OutBack, or the remainder of the initial warranty term, which ever is greater.

THIS LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY APPLICABLE TO OUTBACK PRODUCTS. OUTBACK EXPRESSLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTIES OF ITS PRODUCTS, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. OUTBACK ALSO EXPRESSLY LIMITS ITS LIABILITY IN THE EVENT OF A PRODUCT DEFECT TO REPAIR OR REPLACEMENT IN ACCORDANCE WITH THE TERMS OF THIS LIMITED WARRANTY AND EXCLUDES ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE OR LOST REVENUES OR PROFITS, EVEN IF IT IS MADE AWARE OF SUCH POTENTIAL DAMAGES. SOME STATES (OR JURISDICTIONS) MAY NOT ALLOW THE EXCLUSION OR LIMITATION OF WARRANTIES OR DAMAGES, SO THE ABOVE EXCLUSIONS OR LIMITATIONS MAY NOT APPLY TO YOU.

2008-06-03

LIMITED WARRANTY REGISTRATION

Complete this form and return it to:
Outback Power Systems Inc.
19009 62nd Ave. NE • Arlington, WA 98223

OUTBACK EXTREME LIMITED WARRANTY REGISTRATION

Equipment Owner:

Name/Rank: _____

Organization/Branch of Service: _____

Address: _____ City, State, Zip Code: _____

Country: _____ Telephone Number: _____

E-mail: _____

Address for warranty certificate:

Name/Rank: _____

Organization/Branch of Service: _____

Address: _____ City, State, Zip Code: _____

Country: _____ Telephone Number: _____

E-mail: _____

Product Model Number: _____ Product Serial Number(s): _____

Sold by: _____ Purchase Date: _____

Product Install/Commission Date: _____ System PV Array Nominal Voltage: _____

System Battery Bank Size (Amp Hours): _____ Type of Batteries: _____

General Description of Application: _____

_____

_____

_____

2008-06-03

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