

# GS-IOB-230VAC Input/Output/Bypass Assembly Installation Instructions

## Purpose

This document provides information on how to install the Input/Output/Bypass Assembly needed for a single-phase configuration using an OutBack GSLC (GS Load Center) enclosure.

This product allows manual switching between a single Radian Series Inverter/Charger and an AC source, facilitating maintenance and power continuity. It is intended to be installed within the GSLC or one of its variants.

## Scope

This document covers how to install the input, output, and bypass circuit breakers and the mechanical interlock onto the GSLC. **Wiring requirements are site-specific and will vary by installation.** Certain steps may be omitted or altered if they do not apply to a particular installation.


*These instructions are for use by qualified personnel who meet all local and governmental code requirements for licensing and training for the installation of electrical power systems with AC and DC voltage up to 600 volts.*

## Requirements

OutBack Power's GS-IOB-230VAC is intended as a component for OutBack listed UL508A or UL1741 Industrial Control Panels, specifically the GSLC variants. It is intended for indoor use only. This equipment is to be installed by qualified personnel only. Refer to the *GS Load Center Installation Manual* for complete installation instructions.

## Grounding Instructions

The enclosure for the GS-IOB-230VAC should be connected to a grounded, permanent wiring system. The AC and DC circuits are not bonded to the enclosure chassis. System grounding, when required by local codes, is the responsibility of the installer. All installations should comply with all national and local codes and ordinances.

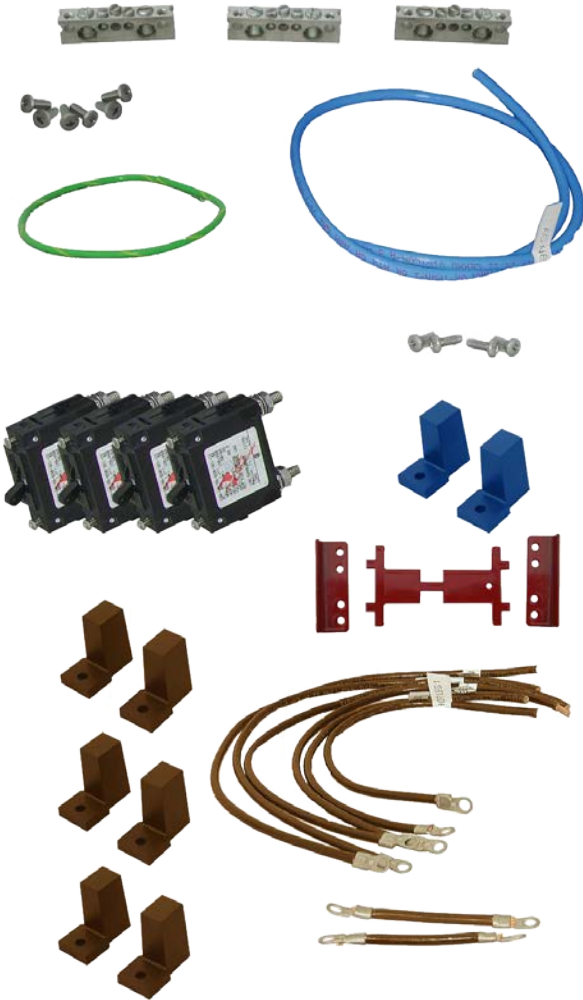
The equipment ground is marked with this symbol: 

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### Tools Required

- Philips Screwdriver
- Flat Screwdriver
- Socket Set
- Digital multimeter (DMM) or ohmmeter

### Components



**Figure 1 GS-IOB-230VAC Components**

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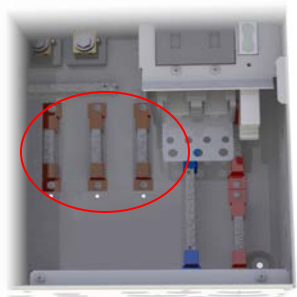
## Table 1 Parts List

Item	Quantity
AC Circuit Breakers, single-pole (50 A, 250 Vac) with 6-32 x ¼" screws installed	4
Label Set	1
Installation Instructions	1
Hardware Kit:	
➤ Bus Bars	3
➤ Bus Bar Insulators, Blue	2
➤ Bus Bar Insulators, Brown	6
➤ Mechanical Bypass Plate, Red	1
➤ Mechanical Bypass Brackets, Red	2
➤ Self-Tapping Screws, 10-32 x ½"	7 (1 extra)
➤ Machine Screws, 6-32 x 3/8"	4
Conductors:	
➤ Wires, Labeled, Brown	6
➤ Wire, Labeled, Blue	1
➤ Wires, Short, Dual-Ring Terminal, Brown	2
➤ Wire, Green	1

## Installing the Bus Bars

The GS-IOB-230VAC has enough parts to install up to three AC bus bars in an enclosure. To install a bus bar in the GSLC:

1. Select one bus bar and two brown insulators. Fit one insulator onto each end of the bus bar.
2. Insert one self-tapping 10-32 x ½" screw through the hole on each insulator. Seat these screws in the GSLC chassis and screw them in. These screws require a large amount of torque to start.
3. Apply the correct label from the label set to the chassis near each bus bar for identification purposes. Figure 2 shows the standard locations for these bus bars. Figure 5 on page 8 shows the intended label positions.



**Figure 2 Bus Bar Positions**

**NOTE:** The neutral and ground bars are already installed. However, the neutral insulators are white. For systems where blue is standard, replacement blue insulators are provided in the kit.



### IMPORTANT:

If the bus bars are placed in other locations or if the labels or electrical use of the bus bars differ from the figure, the wires included in this kit may not be of sufficient length.

# Installing the Circuit Breakers and Mechanical Bypass Assembly

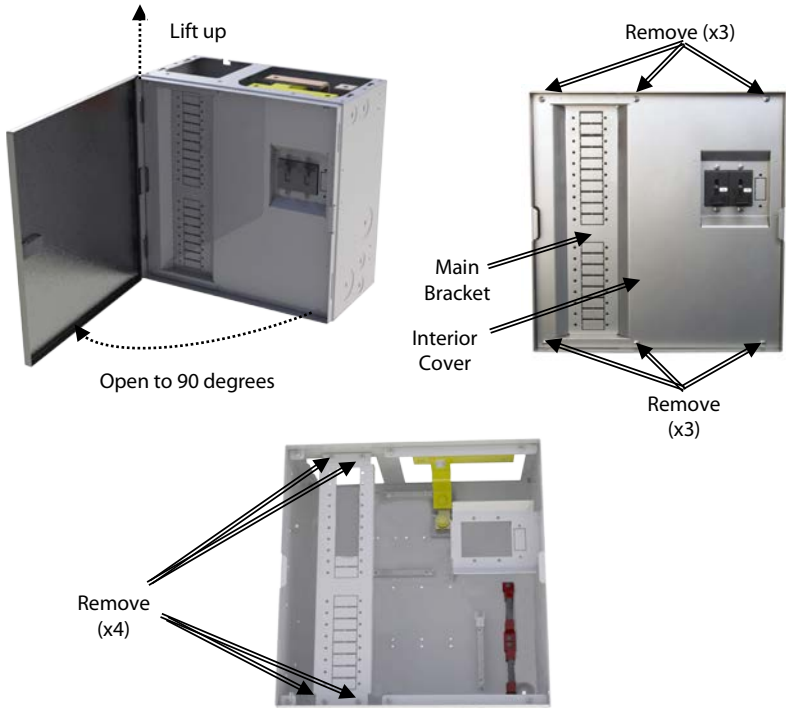
The simplest method to install these devices is to remove the main circuit breaker bracket from the GSLC first. To remove the main bracket:

1. Remove the front cover (sometimes called the “front door”) of the GSLC. Open the door to 90 degrees and lift up about 1/2" to disengage it from the GSLC (see Figure 3).
2. Remove the interior cover (sometimes called the “dead front”) of the GSLC. Remove the six screws installed across the top and bottom of the cover (see Figure 3) and take the interior cover off.<sup>1</sup>
3. Remove the main circuit breaker bracket. Remove the four screws at the top and bottom of the bracket (see Figure 3) and take it off.<sup>1</sup>
4. Remove the pre-installed screws in the circuit breakers before proceeding.

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<sup>1</sup> Star washers may be present under some of these screws. These must be reinstalled later to ensure proper grounding of the enclosure.

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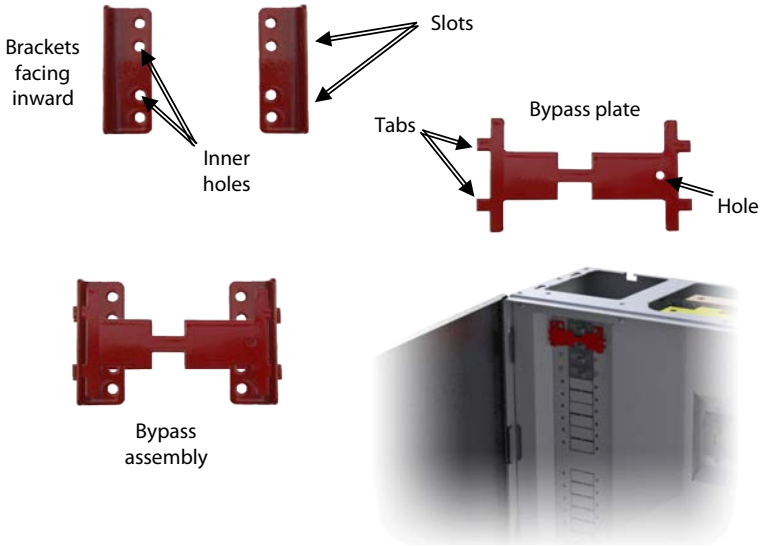
**Figure 3 Removing the Covers and Main Bracket**

Once the main bracket has been removed, remove the top four knockouts. Install the circuit breakers and mechanical bypass according to these steps.

1. Place each circuit breaker behind the bracket and orient it so that the numbers read correctly. Center the device so that the raised area protrudes through the bracket.
2. Place the red bypass brackets over the screw holes for the top two circuit breaker poles. Face the brackets inward as shown in Figure 4. Align the inner holes on the brackets with those on the circuit breakers.
3. While placing the red brackets, insert the red bypass plate between them. The tabs on the plate should fit into the slots on the brackets.  
**NOTE:** The plate must be oriented so the hole is on the right. Both circuit breakers covered by the plate must be in the OFF position.
4. When the bypass mechanism and circuit breakers are in place, insert screws through the holes in the main bracket. Use the 6-32 x 3/8" screws that are provided in this kit to secure the breakers with red brackets. Use the screws previously removed from the circuit breakers to reattach those not covered by the red brackets.

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5. Tighten until secure, but do not over-tighten.



**Figure 4 Installing Mechanical Bypass**

Once installed, the plate will not allow both circuit breakers to be in the ON position. The plate can slide to allow one device to be turned on. The upper circuit breaker allows the inverter's output to deliver power normally to the loads. The lower one causes the AC source to bypass the inverter directly to the loads.

### Basic AC Wiring

The GS-IOB-230VAC comes with six brown and one blue wire that are labeled according to their intended electrical connection. It also comes with an unlabeled green wire and two unlabeled short brown wires. If the preceding steps are followed, as well as the drawing in Figure 5, these wires will have sufficient length to make the intended connections.

It is recommended that the wires be connected to the circuit breakers prior to re-installing the main circuit breaker bracket. To install the wires:

1. Remove the nuts and washers from each circuit breaker, noting the sequence of the washers.
2. For each of the six wires, install the wire's ring terminal on the appropriate terminal post for each circuit breaker according to Figure 5. Typically each post is equipped with two identical star washers. The ring terminal on the wire should be installed between these star

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washers. If there is only one star washer, install the ring terminal on the post first, then the star washer and the remaining hardware.

3. Install the two short wires between the input, output, and bypass circuit breakers as shown in Figure 5.
4. Torque the nuts on each circuit breaker to 4 Nm (35 in-lbs).
5. Re-install the main circuit breaker bracket using the four screws and any star washers that were previously removed. Use the illustrations in Figure 3 on page 5 for reference.
6. Connect the brown wires from each circuit breaker to the appropriate bus bar as shown in Figure 5.
7. Connect the blue AC Neutral wire to the neutral bus bar.
8. Connect the green wire to the ground bus bar.

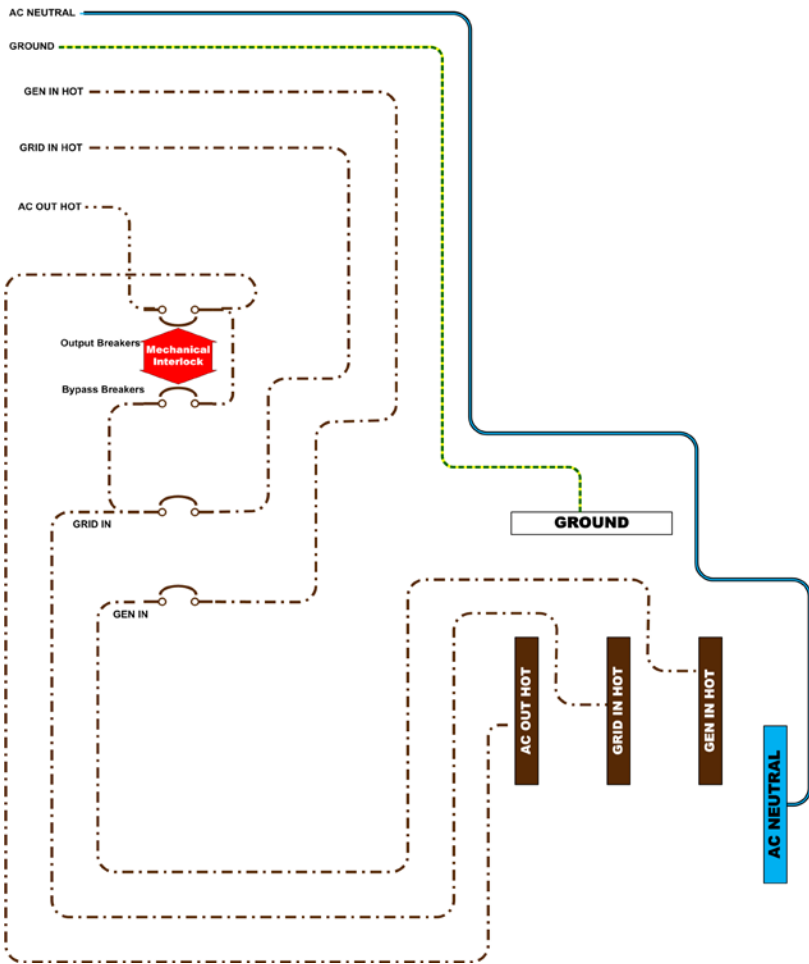
All wires from steps 6, 7, and 8 should be torqued to 2.8 Nm (25 in-lbs). It is recommended to make 90-degree bends in the wires as shown, so that the layout is easy to follow in the future. (The wires have been designed to be long enough.)

At this time, all wires should be connected to bus bars or circuit breakers. Certain wires will only have one end connected, with the other end meant to be connected to a 230 Vac Radian Series Inverter/Charger. (This is usually positioned above the GSLC.) The disconnected wires should have these labels:

- AC OUT HOT LEG 1
- GRID IN HOT LEG 1
- (Green Wire – No Label)
- GEN IN HOT LEG 1
- AC NEUTRAL

Before connecting these wires to the inverter, use a digital multimeter to check that all electrical connections are correct and show continuity. Once confirmed, connect the wires to the Radian inverter/charger, removing knockouts and installing bushings as necessary. Refer to the installation manuals for the Radian inverter and the GSLC for additional wiring instructions.

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**Figure 5 Basic AC Wiring**

At this stage, the installation is complete. The interior cover must be re-installed using the six screws and star washers previously removed. The front cover can then be re-installed. Use the illustrations in Figure 3 on page 5 for reference.

There may be a label on the inside of the front cover that identifies the circuit breakers and their usage. The label set included with this kit can be used to mark the circuit breakers that were just installed.





## About OutBack Power Technologies

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

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