## Specifications

### Electrical and Mechanical Specifications

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<td>Maximum Voltages</td>
<td>240 Vac and 300 Vdc</td>
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<td>Maximum Continuous Currents(^1)</td>
<td>40 Aac and 100 Adc</td>
</tr>
<tr>
<td>Operating Frequency Range</td>
<td>50/60 Hz or DC</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>–20 to 50°C</td>
</tr>
<tr>
<td>Dimensions (H × W × D)</td>
<td>17 × 16 × 8.5” (43.2 × 40.6 × 21.6 cm)</td>
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<td>Shipping Dimensions (L × W × H)</td>
<td>23.25 × 20.5 × 13.25” (59.1 × 52.1 × 33.7 cm)</td>
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<tr>
<td>Weight</td>
<td>26 lb (11.8 kg) minimum — varies with options</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>34 lb (15.4 kg) minimum — varies with options</td>
</tr>
<tr>
<td>Enclosure Type</td>
<td>Indoor</td>
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</tbody>
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\(^1\) The Maximum Continuous Currents rating applies to any single device connection point within GS pre-wired system. All prewired configurations were engineered and tested to meet UL1741 and current NEC 2017 requirements. All additional conductors and connections shall be sized in accordance with the National Electric Code.

### Regulatory Specifications

- UL 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources (2nd Edition)
- Canadian Electrical Code, Part II (CSA C22.2 No. 107.1-16 Ed.4)

### Contact Information

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### Date and Revision

January 2020, Revision D
Models and Options

The GSLC is available in several different configurations:

- **GSLC** – GS Load Center for Radian Series. The “basic” or “empty” version; requires almost all components to be installed if needed. Recommended for custom-built systems. Recommended for use with multiple Radian inverters (one GSLC per inverter). Can be used with other inverter models. The term “GSLC” is also used to refer generically to the product line.
  - Intended for any Radian model.
  - The following components are sold separately for the GSLC:
    - Inverter Main Disconnects (required for inverter installations)
    - AC Maintenance Bypass Assembly
    - AC Terminal Bus Bars (TBB)
    - PV Ground Fault Detector-Interrupter (GFDI)
    - FLEXnet DC Battery Monitor (FN-DC)
    - Additional DC shunts and GS-SBUS
    - PV Disconnect 80-amp circuit breaker (PNL-80-DC)

The following two “inverter-only” versions have hardware for Radian inverter AC and DC connections. Battery monitoring or PV capability must be installed as needed. For details on installing batteries and a renewable energy source such as a PV array, please see the GSLC online manual:

- **GSLC175-120/240** – GS Load Center for AC applications (split-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, and 120/240 Vac maintenance bypass assembly. Recommended for systems which have a single Radian inverter and an AC source, but can be customized in other ways. See page 14.
  - Intended for Radian model GS8048A.
- **GSLC175-230** – GS Load Center for AC applications (single-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, and 230 Vac maintenance bypass assembly. Recommended for systems which have a single Radian inverter and an AC source, but can be customized in other ways. See page 19.
  - Intended for Radian model GS7048E.

  - The following components are sold separately for these models:
    - PV Ground Fault Detector-Interrupter (GFDI)
    - FLEXnet DC Battery Monitor (FN-DC)
    - Additional DC shunts and GS-SBUS
    - PV Disconnect 80-amp circuit breaker (PNL-80-DC)

For instructions on installing components please refer to the GSLC online manual.

These “fully-loaded” versions have all options already present and need only external wiring and devices added:

- **GSLC175PV-120/240** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, and 120/240 Vac maintenance bypass assembly, two PV array inputs, PV GFDI, FLEXnet DC battery monitor, and three shunts. Intended as a “plug-and-play” solution for systems with a single inverter, two FLEXmax 60 or FLEXmax 80 charge controllers, and battery monitoring.
  - Intended for Radian model GS8048A and 150 Vdc charge controllers. See page 15.
- **GSLC-PV-300VDC** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, 120/240 Vac maintenance bypass assembly, one PV array input, PV GFDI, FLEXnet DC battery monitor, and three shunts. Intended as a “plug-and-play” solution for systems with a single inverter, two FLEXmax 100 charge controllers, and battery monitoring.
  - Intended for Radian model GS8048A and 300 Vdc charge controllers. See page 16.
- **GSLC175PV1-120/240** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with one 175 Adc inverter circuit breaker, dual AC inputs, 120/240 Vac maintenance bypass assembly, one PV array input, FLEXnet DC battery monitor, and two shunts. Intended as a “plug-and-play” solution for systems with a single inverter, one FLEXmax 60 or FLEXmax 80 charge controller, and battery monitoring.
  - Intended for Radian model GS8048A and 150 Vdc charge controllers. See page 17.
- **GSLC-PV1-300VDC** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with one 175 Adc inverter circuit breaker, dual AC inputs, 120/240 Vac maintenance bypass assembly, one PV array input, FLEXnet DC battery monitor, and two shunts. Intended as a “plug-and-play” solution for systems with a single inverter, one FLEXmax 100 charge controller, and battery monitoring.
  - Intended for Radian model GS4048A and 150 Vdc charge controllers. See page 18.
- **GSLC175PV-230** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, and 230 Vac maintenance bypass assembly. Recommended for systems which have a single Radian inverter and an AC source, but can be customized in other ways. See page 20.
  - Intended for Radian model GS7048E and 150 Vdc charge controllers.
- **GSLC-PV-300VDC-230** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with dual 175 Adc inverter circuit breakers, dual AC inputs, 230 Vac maintenance bypass assembly, one PV array input, FLEXnet DC battery monitor, and two shunts. Intended as a “plug-and-play” solution for systems with a single inverter, two FLEXmax 60 or FLEXmax 80 charge controllers, and battery monitoring.
  - Intended for Radian model GS4048A and 300 Vdc charge controllers. See page 21.
- **GSLC175PV1-230** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with one 175 Adc inverter circuit breaker, dual AC inputs, 230 Vac maintenance bypass assembly, one PV array input, FLEXnet DC battery monitor, and two shunts. Intended as a “plug-and-play” solution for systems with a single inverter, one FLEXmax 60 or FLEXmax 80 charge controller, and battery monitoring.
  - Intended for Radian model GS3548E and 150 Vdc charge controllers. See page 22.
- **GSLCPV1-300VDC-230** – GS Load Center for PV and AC applications (split-phase). Factory-prepared with one 175 Adc inverter circuit breaker, dual AC inputs, 230 Vac maintenance bypass assembly, one PV array input, PV GFDI, FLEXnet DC battery monitor, and two shunts. Intended as a “plug-and-play” solution for systems with a single inverter, one FLEXmax 100 charge controller, and battery monitoring.
  - Intended for Radian model GS3548E and 300 Vdc charge controllers. See page 23.
Different versions of the GSLC come with different components installed. The diagrams on this page depict the most common versions—GSLC175-PV-120/240 and GSLC175-PV-230. For diagrams of other versions and details about separate components available, please see pages 10-16 of the GS Load Center Installation Manual.

Components

1. Inverter Negative (–) DC Bus Bar
2. Negative (–) Terminal Bus Bar (TBB-WHITE)
3. Ground TBB (TBB-GROUND)
4. Neutral TBB (NA: TBB WHITE or EU: TBB-BLUE)
5. PV Positive (+) TBB (TBB-RED)
6. In 300 Vdc models, this TBB is PV Negative (–) TBB-BLACK
7. DC Positive (+) Cable Plate (FW-BBUS)
8. Main Inverter Disconnect(s) (PNL-175-DC)
9. Inverter Positive (+) DC Bus Bar
10. Shunt (FW-SHUNT500)
11. AC Input Circuit Breakers (PNL-50-AC-230V)
12. Maintenance Bypass Interlock

Tools Required
- Open-ended wrenches (7/16", 9/16" and 13 mm)
- Wire cutters/strippers
- Torque wrenches
- Assorted insulated screwdrivers
- Digital Voltmeter (DVM) or regular voltmeter

Dimensions

GSLC175-PV-120/240
GSLC175-PV-230

Right Side
Left Side
Front

Bottom

1. 2" or 63 mm
2. 1 ¼" or 32 mm
3. ½" or 20 mm
4. Mounting holes for HUB product
5. Mounting holes for FW-CCB and FW-CCB2 brackets

1. 2" or 63 mm
2. 1 ½" or 50 mm
3. ½" or 20 mm
4. Mounting holes for HUB product
5. Mounting holes for FW-CCB and FW-CCB2 brackets

1. 2" or 63 mm
2. 1 ½" or 50 mm
3. ½" or 20 mm
4. Mounting holes for HUB product
5. Mounting holes for FW-CCB and FW-CCB2 brackets
Remove Covers

To remove front door, open 90 degrees and lift straight up.

WARNING: Shock Hazard
If the GFDI is manually installed, the negative-ground bond on the GSLC must be removed. This must also be done if any other PV ground fault device is present that establishes its own negative-ground bond.

NOTE:
Models equipped with a GFDI do not include the mechanical bond inside the housing, as the GFDI provides a bond instead. The 300 Vdc models do not include an internal bond, as they are intended to be used with charge controllers that have GFDI protection built-in.

Mounting the GSLC to the Inverter

For instructions on mounting the GSLC to the inverter, see the Radian Quick Start Guide; more details are also available in the GSLC online manual: www.outbackpower.com.

To remove either of the bond connections:
1. Using a Phillips screwdriver, remove the screw shown above.
2. Remove the metal standoff beneath the bus bar. The screw and bus bar provide the mechanical bond to the chassis ground.
3. Rotate the TBB mount. Insert the bus bar into the open end of the TBB mount so that the TBB mount supports the bus bar. It may be necessary to loosen the TBB mount screw before rotating it.
4. Retighten the screw to secure the TBB mount.

NOTE:
- If the TBB is connected directly to the enclosure by a screw, then the bond is connected. If the TBB is held by the TBB mount and the TBB mount is secured to the enclosure, the bond is disconnected.
- The installed Neutral TBB has white insulators. A second Neutral TBB with blue insulators is included in the kit for locations where blue is standard.

Bonding

Some models are equipped with a mechanical bond between AC neutral and ground.

Some models are equipped with a mechanical bond between DC negative and ground.

If other neutral or negative bonds are present, or if a GFDI is installed later, the GSLC bond(s) must be removed. The bonds can be useful in stand-alone systems where no other bond is provided.

The GSLC’s neutral bus bar is located in the lower right portion of the GSLC. The neutral-ground bond is established at one end of the bar, near the base of the GSLC.

The GSLC’s negative (–) bus bar is located near the top of the GSLC. It is attached to the inverter negative (–) bus and its shunt.
WARNING: Shock Hazard
Ensure all circuit breakers or disconnect devices are turned off or disconnected before connecting any wires.

CAUTION: Fire Hazard
Never install extra washers or hardware between the mounting surface and the battery cable lug. When installing multiple ring terminals or lugs, stack them on the mounting surface so that the largest conductor is in direct contact. Smaller ring terminals should be placed next in decreasing size order. Stacking the hardware in any other order can result in a loss of contact area for current flow. This may allow dangerous levels of heat to build up.

Consult the inverter Installation Manual for recommendations for cable number, sizing, and length.

Battery Wiring

Battery Positive (+) Cable
Follow the instructions below when connecting battery positive (+) cables to these models:

- GSLC175-120/240
- GSLC175-230
- GSLC175PV-120/240
- GSLC175PV-1-300VDC
- GSLC175PV-1-230
- GSLC175PV-1-300VDC-230

Connect the positive (+) cables to the DC positive (+) wiring plate. This plate is located directly beneath the main inverter disconnects. It is intended for several ring lugs to be bolted to it.

- The smaller holes have a diameter of 0.31" (8 mm).
- The larger holes have a diameter of 0.4" (10 mm).

See the Radian Quick Start Guide for hardware installation order on the positive (+) plate.

Follow the instructions below when connecting battery positive (+) cables to these models:

- GSLC175PV-1-120/240
- GSLC175PV-1-300VDC
- GSLC175PV-1-230
- GSLC175PV-1-300VDC-230

Connect the positive (+) cable directly to the DC disconnect, which uses an M8 stud.

Follow the appropriate instructions when connecting to an “empty” GSLC which has been assembled with similar features to one of the models above.

PV and Charge Controller Wiring
When wiring the FLEXmax, FLEXmax 100, or another charge controller to the GSLC, many elements are involved. These elements include the PV or RE source, the battery connections, the disconnect circuit breaker, the PV ground fault device, and the charge controller. These instructions are written for a PV source which uses the OutBack FLEXmax charge controller and the GFDI. Other applications will be similar.

To make PV and charge controller connections:

1. Connect the PV positive wire to the GSLC’s PV positive (+) TBB.
   - In 300-volt models, connect this wire to the PV circuit breaker.
2. Connect the PV negative wire to the charge controller’s PV negative (–) terminal.
   - In 300-volt models, connect this wire to the PV negative (–) TBB.
3. Install a wire from the PV positive (+) TBB to the PV circuit breaker.
   - In 300-volt models, this step does not apply.
4. Install a wire from the PV circuit breaker to the charge controller’s PV positive (+) terminal.
5. Install a wire from the GSLC’s DC positive (+) cable plate to the charge controller’s circuit breaker.
6. Install a wire from the charge controller circuit breaker to the charge controller’s battery positive (+) terminal.
7. Install a wire from the charge controller’s battery negative (–) terminal to a shunt bolt. If the FLEXnet DC or another battery monitor is in use, this wire should connect to the shunt which monitors that charge controller.
8. Repeat all steps for a second charge controller, if necessary.

Installing the FLEXnet DC
The OutBack FLEXnet DC (FN-DC), or a similar battery monitor, may be added to the GSLC for observing DC current flow and providing battery state-of-charge information.

1. Assemble the FN-DC wiring as shown in the manual for the FN-DC.
   - Attach sense wires to the FN-DC wiring block and plug it into the FN-DC.
2. Connect FN-DC wiring to the GSLC. The positive (+) and negative (–) battery voltage sense conductors should connect directly to the battery bank.
3. Mount the FN-DC.

When connecting sensing wires: The end of the shunt connected to the GS-SBUS is the negative (–) battery connection and should be wired accordingly. The other end of the shunt is the “device” or “load” end and should be wired accordingly.
### Split-Phase Wiring

The GSLC can have multiple terminal bus bars for multiple AC connections. Because the Radian inverter possesses two sets of AC input connections and one set of output connections, up to three TBB sets are available. Each set of bus bars is paired in red and black, for the 120/240 Vac connections required by the Radian inverter.

The TBB set on the left is generally used for the inverter’s AC output connections. The central TBB set is for utility grid input connections and the right TBB set is for a generator input. The preassembled GSLC models follow this convention.

Each TBB accepts conductors from 1/0 (70 mm$^2$) to #14 AWG (2.5 mm$^2$). See the Radian Quick Start Guide for proper torque values.

If steps are inappropriate for a given system (such as instructions for a generator when none is present), they can be ignored.

To make the external AC connections to the split-phase GSLC:

1. Connect the L1 wire from the AC load panel to black TBB 1 (AC Output - Hot L1). Connect the L2 wire from the AC load panel to red TBB 2 (AC Output - Hot L2).
2. Connect the neutral wire from the AC load panel to neutral TBB 3.
3. Connect the L1 wire from the utility grid panel (if present) to black TBB 4 (Grid In - Hot L1). Connect the L2 wire from the utility grid panel to red TBB 5 (Grid In - Hot L2).
4. Connect the neutral wire from the utility grid panel (if present) to neutral TBB 3.
5. Connect the L1 wire from the generator (if present) to black TBB 6 (Gen In - Hot L1). Connect the L2 wire from the generator to red TBB 7 (Gen In - Hot L2).
6. Connect the neutral wire from the generator (if present) to neutral TBB 3.

**NOTE:** Remove the neutral-ground bond if necessary.

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### Single-Phase Wiring

The GSLC allows multiple terminal bus bars (TBB) for multiple AC connections. Because the Radian inverter possesses two sets of AC input connections and one set of output connections, three terminal bus bars are available for hot connections, as well as one neutral bus bar. The hot bus bars use brown insulators in 230 Vac models. The neutral bus bar uses blue insulators in 230 Vac models.

The TBB on the left is generally used for the inverter’s AC output connections. The central TBB is for utility grid input connections and the right TBB is for a generator input. The preassembled GSLC models follow this convention.

Each TBB accepts conductors from 70 mm$^2$ (1/0 AWG) to 2.5 mm$^2$ (#14 AWG). See the Radian Quick Start Guide for proper torque values.

If steps are inappropriate for a given system (such as instructions for a generator when none is present), they can be ignored.

To make external AC connections to the single-phase GSLC:

1. Connect the hot wire from the AC load panel to brown TBB 1 (AC Output).
2. Connect the neutral wire from the AC load panel to neutral TBB 2.
3. Connect the hot wire from the utility grid panel (if present) to brown TBB 3 (Grid).
4. Connect the neutral wire from the utility grid panel (if present) to neutral TBB 2.
5. Connect the hot wire from the generator (if present) to brown TBB 4 (Generator).
6. Connect the neutral wire from the generator (if present) to neutral TBB 2.

**NOTE:** Remove the neutral-ground bond if necessary.

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**WARNING:** Shock Hazard

Ensure all circuit breakers or disconnect devices are turned off or disconnected before connecting any wires.
**Bypass Switches**

Inverter systems are often equipped with maintenance bypass switches or interlocks. If the inverter system ever needs to be shut down or removed, its AC sources and loads must be disconnected. A bypass device allows the AC source to “bypass” the inverter and deliver power directly to the loads. This can minimize disruption to the system and it avoids the need for extensive rewiring.

**WARNING: Shock Hazard or Equipment Damage**

- Bypassing multiple sources will usually connect the sources to each other, which may damage one or both sources. It can otherwise result in power being routed to inappropriate places.
- The bypass assembly does not disconnect the inverter’s AC input.
- Even with the inverter bypassed, any AC input source may be a shock hazard unless disconnected.

In the illustration below, when Switch 1 is on (normal operation), the inverter’s output sends power to the loads. Switch 2 is off, preventing the inverter from sending power back to the AC source (backfeeding).

When Switch 2 is on (bypass operation), the AC source sends power directly to the loads. Switch 1 is off, removing the inverter’s output from the loads. This also prevents the AC source from backfeeding the inverter. With the inverter removed from the circuit, maintenance can be performed as necessary.

The GSLC can be ordered with bypass circuit breakers for this purpose, or it has a bypass option (the GS-IOB-120/240VAC or GS-IOB-230VAC) which can be installed.

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**NOTES**

- The inverter may use an AC source which powers the inverter’s output. The bypass assembly does not disconnect the inverter’s input.
- Switch 1 and Switch 2 are prevented from being on at the same time by the Mechanical Interlock. Although both switches can be off, only one can be on.
- In OutBack bypass assemblies, circuit breakers are used instead of standard switches.
NOTE:
This GSLC model has a neutral-ground bond which is added during construction. It is not depicted here. The bond can be removed if necessary. See page 7.

GSLC175-120/240

See Page 12

See Page 12

See Page 9

NOTE:
This GSLC model has a neutral-ground bond which is added during construction. It is not depicted here. The bond can be removed if necessary. See page 7.

GSLC175-PV-120/240 with FN-DC
NOTE:
This GSLC model has a neutral-ground bond which is added during construction. It is not depicted here. The bond can be removed if necessary. See page 7.

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Wiring Diagrams

GSLC-PV-300VDC with FN-DC

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GSLC175PV1-120/240 with FN-DC

See Page 9

See Page 12

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NOTE:
This GSLC model has a neutral-ground bond which is added during construction. It is not depicted here. The bond can be removed if necessary. See page 7.
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**Wiring Diagrams**

**NOTE:**
This GSLC model has a neutral-ground bond which is added during construction. It is not depicted here. The bond can be removed if necessary. See page 7.

**GSLC175PV1-230 with FNDC**

![GSLC175PV1-230 Wiring Diagram]

**GSLCPV1-300VDC-230 with FN-DC**

![GSLCPV1-300VDC-230 Wiring Diagram]