

Listings:

- UL® 1741 2nd Edition with SA
- CSA C22.2, No. 107.1-16 Ed:4

Certifications:

- IEEE® 1547
- IEEE 1547.1

System Grounding and Bonding:

In this product, the AC and battery circuits are isolated from the enclosure.

Equipment grounding is required by Section 250 of the National Electric Code (ANSI/NFPA® 70) and Canadian Electrical Code (C22.1).

Overcurrent Protection

- Battery disconnection and overcurrent protection are not provided in the wiring compartment. The installer must provide protection for the battery circuit according to the following parameters.
 - Maximum 250 Adc
 - Minimum 10 kA AIC
 - Listed to UL 489
- The wiring compartment provides AC overcurrent protection for the utility grid input.
 - 60 Aac
 - Listed to UL 489 for AC output and utility grid 120/240 Vac circuits
 - Recognized to UL 1077 for generator 120/240 Vac circuits
- DIN rail space is provided for circuit breakers for a generator, if installed. See **Wiring**.

Environmental Ratings:

- Environmental : NEMA Type 1 (Ingress Protection 2X)
- Ambient Temperature Range (operating): -20°C to 50°C



CAUTION:

To reduce the risk of fire, connect only to a circuit provided with a 60 amperes maximum branch-circuit protection in accordance with the National Electric Code, ANSI/NFPA 70.

Date and Revision

August 2021, Revision A

Dimensions and Weight:

- Height 37.75" (95.9 cm)
- Depth 11.22" (28.5 cm)
- Width 15.87" (40.3 cm)
- Weight 133.0 lb (60.3 kg)

Electrical Specifications

- Maximum continuous output: 8000 VA @ 40°C
- Nominal input and output voltage: 120/240 Vac
- Nominal frequency: 60 Hz
- Nominal grid voltage range: 211.2 to 264 Vac
- Maximum continuous output current
 - Grid-tied: 32 Aac
 - Off-grid: 34 Aac
- Maximum grid input current: 55 Aac
- Maximum generator input current: 55 Aac
- **Aux** output: 0.8 A @12 Vdc
- **Aux** relay: 4 A @250 Vac and 30 Vdc
- Nominal battery voltage: 48 Vdc
- Maximum battery input current: 200 Adc
- Maximum battery charging current: 170 Adc
- Battery input voltage range: 40 to 60 Vdc
- Charging output voltage range: 40 to 64 Vdc

Supported Batteries

- Supports most 48-Vdc lead-acid batteries; consult battery manufacturer for recommended settings
- Specified lithium-ion batteries; see list of qualified batteries at www.outbackpower.com



CAUTION: Battery Damage

OutBack Power does not approve custom applications, including installation of lithium-ion batteries that have not been published as installable with OutBack Power equipment. See the *Mojave Operator's Manual* for more information.



IMPORTANT:
Not intended for use with life support equipment.

Warranty

The warranty for this product can be downloaded from www.outbackpower.com/downloads/warranty_and_safety/warranty_mojave. A copy is available by sending a self-addressed envelope to this address:

Contact Information

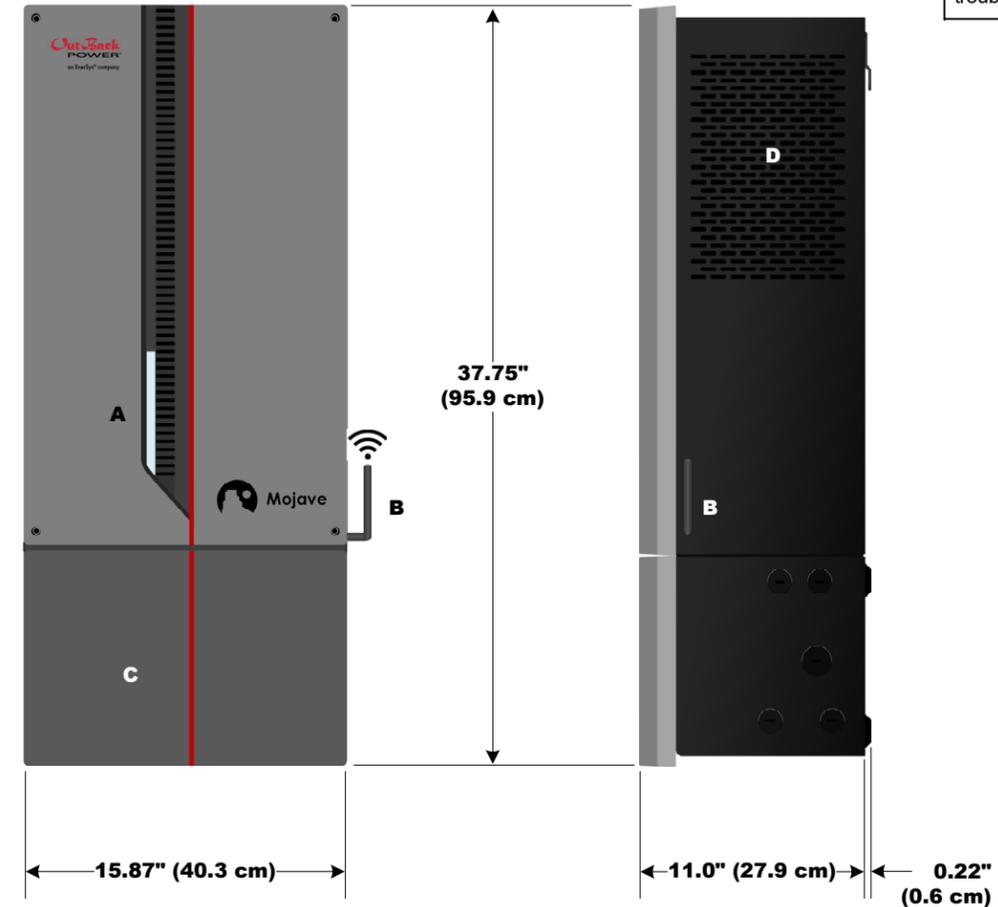
Mailing Address: 7360 – South Kyrene Road
Tempe, AZ 85283 USA
Web Site: www.outbackpower.com

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Mojave™ Grid-Hybrid Inverter/Charger OGHI8048A

NOTE: Additional information on this product is available at www.outbackpower.com. For user interface (UI) navigation, programming, and troubleshooting, see the *Mojave Operator's Manual*.



Features:

- A.** Indicator light
- B.** Wi-fi antenna
- C.** Wiring compartment
- D.** Vent

Included in Box:

- Mojave inverter
- Product installation literature
- Safety statement
- Wi-fi antenna
- Ground-bonding conductor
- Mounting bracket
- Hardware kit
- Current transducers

Tools Needed:

- Socket wrench
 - $\frac{7}{16}$ " socket
 - 7 mm socket
- Socket wrench, torque
 - 13 mm socket
- Screwdriver, #2 Phillips
- Screwdriver, torque
 - #2 Phillips
 - Flat blade



WARNING: Burn Hazard

The vents (the sides of the product; see **D**) may give off heated air. Install this product so that casual contact does not occur.



WARNING: Fire/Explosion Hazard

Do not place combustible or flammable materials within 12 feet (3.7 m) of the equipment. This unit employs mechanical relays and is not ignition-protected. Fumes or spills from flammable materials could be ignited by sparks.



WARNING: Personal Injury

Use safe lifting techniques and standard safety equipment when working with this equipment.



IMPORTANT:

Read all safety instructions before proceeding.



IMPORTANT:

- ❖ This document is for use by qualified personnel familiar with energy storage systems (ESS) and basic inverter functionality. Users of this document should 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. This product is only serviceable by qualified personnel.
- ❖ Clearance and access requirements may vary by location.
 - ✓ Allow 8" (20.3 cm) on either side of the unit for ventilation.
 - ✓ A 36" (91.4 cm) clear space in front of the system for access is recommended.
 - ✓ Consult local electric code to confirm clearance and access requirements for the specific location. If this product is installed or used in a manner other than specified, the protection it provides may be impaired.
- ❖ This inverter is for use in backup power and AC-coupled applications. Use with independent solar charge controllers is not supported at this time.
- ❖ This product is designed and tested for stationary applications only. It is not listed or warranted for mobile use.

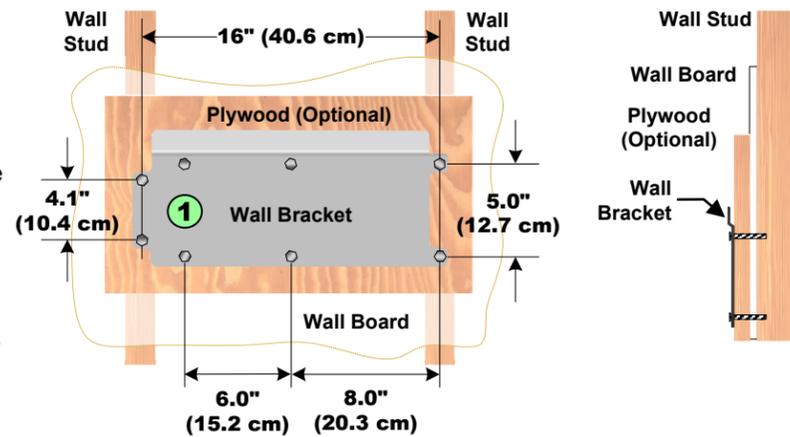
Mounting

Wall Bracket

The wall bracket is made of 14 Ga. galvanized. Ensure that the mounting surface is strong enough to handle three times the unit weight. (See **Specifications**.) Add plywood or other material as necessary to strengthen the surface.

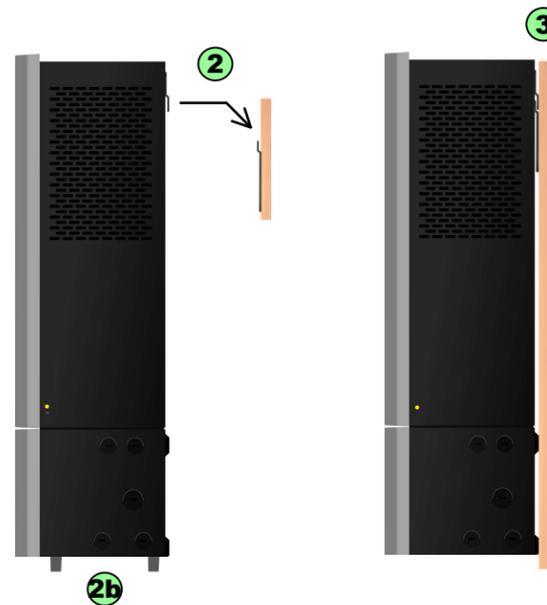
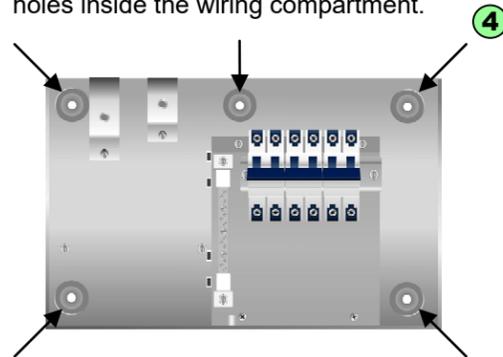
Lag screws of 1/4" thickness are provided in the hardware kit. Use a 7/16" socket to install. If other fasteners are used, ensure that they are rated for a minimum of 200 pounds and appropriate for the mounting surface.

If the Mojave battery is in use, see the *Mojave Battery Quick Start Guide* for more system mounting information.



To Mount the Inverter:

1. Install the wall bracket.
2. Lift up the inverter so that the matching bracket on the back of the inverter fits over the wall bracket. As the unit exceeds 130 pounds (60 kg), two people may be required for this task.
3. Hang the inverter on the wall.
4. Install one or more screws through the securing holes inside the wiring compartment.



CAUTION: Equipment Damage

Until at least one securing screw is installed, the Mojave inverter is not considered to be securely installed. It may be able to fall.

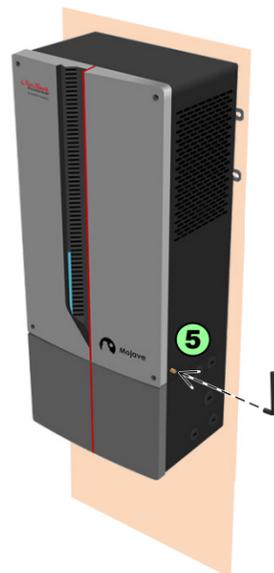
5. Install the wi-fi antenna by screwing it into the connection in the side of the inverter.

Mounting is complete.



NOTES:

- ❖ Four feet are attached to the bottom of the inverter (2b). These provide a stable surface to rest the inverter after unboxing. After mounting, the feet can be removed with a #2 Phillips screwdriver and a 7 mm socket.
- ❖ The wiring compartment is attached to the inverter and is not removable.

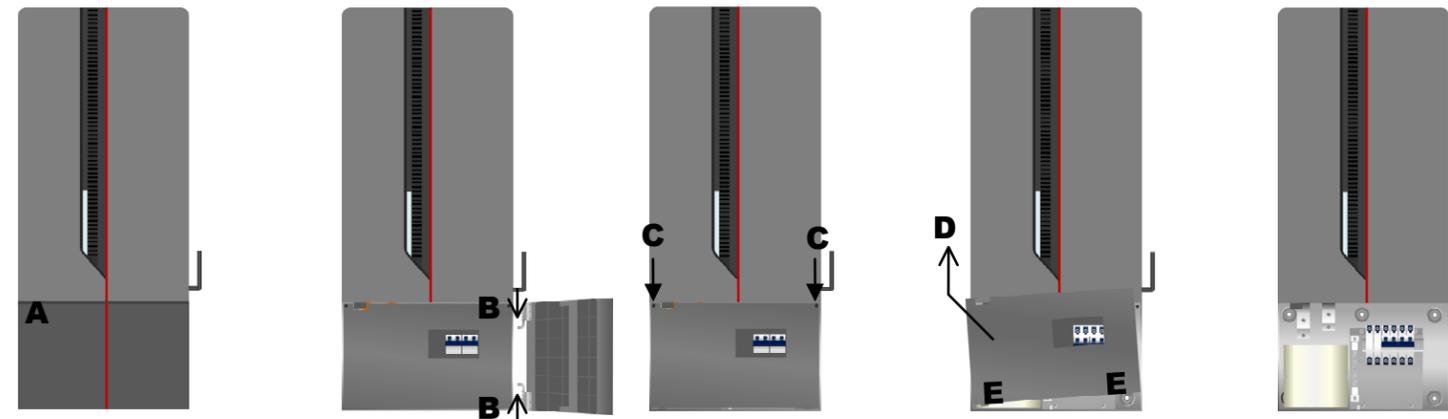


Wiring Compartment

The lower section houses the system wiring, which connects to battery, AC, and other wire. AC wires must be in conduit.

The compartment door has a latch which disengages by pressing at **A**. The compartment door swings to the right. Remove the door by pulling inward on the pins (**B**) at the corners of the door.

Inside is a "dead front" which prevents accidental contact with anything other than the circuit breakers. The dead front must be removed before wiring. Remove the two screws (**C**) at the corners of the dead front. Remove the dead front by pulling upward and out (**D**). It is held in place by tabs (**E**) on the bottom edge.



When replacing the dead front, insert the bottom tabs, push into place, and reattach the screws **C**.

| | Permitted Sizes | | Torque Requirements | |
|--------------------|---------------------|-------------------|---------------------|---------------------|
| | AWG | mm ² | In-lb | Nm |
| Battery | 4/0 | 120 | 65 to 75 in-lb | 7.3 to 8.5 Nm |
| AC | #8 to #3 | 6 to 25 | 18 to 22 in-lb | 2.0 to 2.5 Nm |
| AUX | #24 to #16 | 0.25 to 1.5 | N/A | N/A |
| Neutral and Ground | #14 to #10 | 2.5 to 4 | 20 | 2.3 |
| | #8 | 6 to 10 | 25 | 2.8 |
| | #6 to #3 | 16 to 25 | 35 | 4.0 |
| | #2 | 35 | 40 | 4.5 |
| Wiring Knock-Outs | #1 to 1/0 | 50 | 50 | 5.7 |
| | Left | | Bottom | Right |
| | 3/4" trade size x 4 | | 3/4" trade size x 4 | 3/4" trade size x 4 |
| 1" trade size x 1 | | 1" trade size x 1 | 1" trade size x 1 | |
| | | 2" trade size x 1 | | |

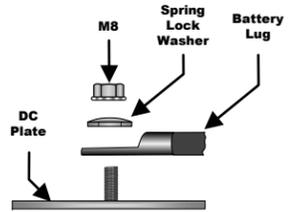


IMPORTANT

- ❖ All AC and battery conductors must be copper-only. AC conductors must be rated at 90°C or higher. Battery conductors must be rated at 75°C or higher.
- ❖ The battery cable should not exceed 10 feet (3 meters) in length.

Battery Cable Connections

NOTE: The spring lock washer used in these connections must be installed with the rounded (convex) side facing outward. Installing in any other orientation will result in inadequate compression which may be hazardous. See the **CAUTION** below.



WARNING: Shock Hazard

Before performing maintenance, all sources (battery, AC, and grid-direct inverter) must be completely de-energized for at least five minutes.



CAUTION: Fire Hazard

Before energizing, confirm that all battery terminal hardware is installed as shown above. Stacking the terminal hardware in any other order can overheat the terminals.



CAUTION: Equipment Damage

When connecting to the battery terminals, make sure to observe the proper polarity. Connecting the cables incorrectly can damage or destroy the equipment and void the product warranty.

Wiring

NOTES

- ❖ Tighten the applicable connections to the torque values specified in Table 1. (See opposite sheet.)
- ❖ A generator circuit breaker is not included in this system and must be installed on the DIN rail if a generator is to be used. Route the generator L1 and L2 wires from the location of the circuit breaker to the **GEN** terminals **C**. This page depicts these items as installed.
- ❖ The main battery disconnect cannot be installed in the inverter's wiring compartment. See local wiring codes for the requirements for disconnects and overcurrent protection.

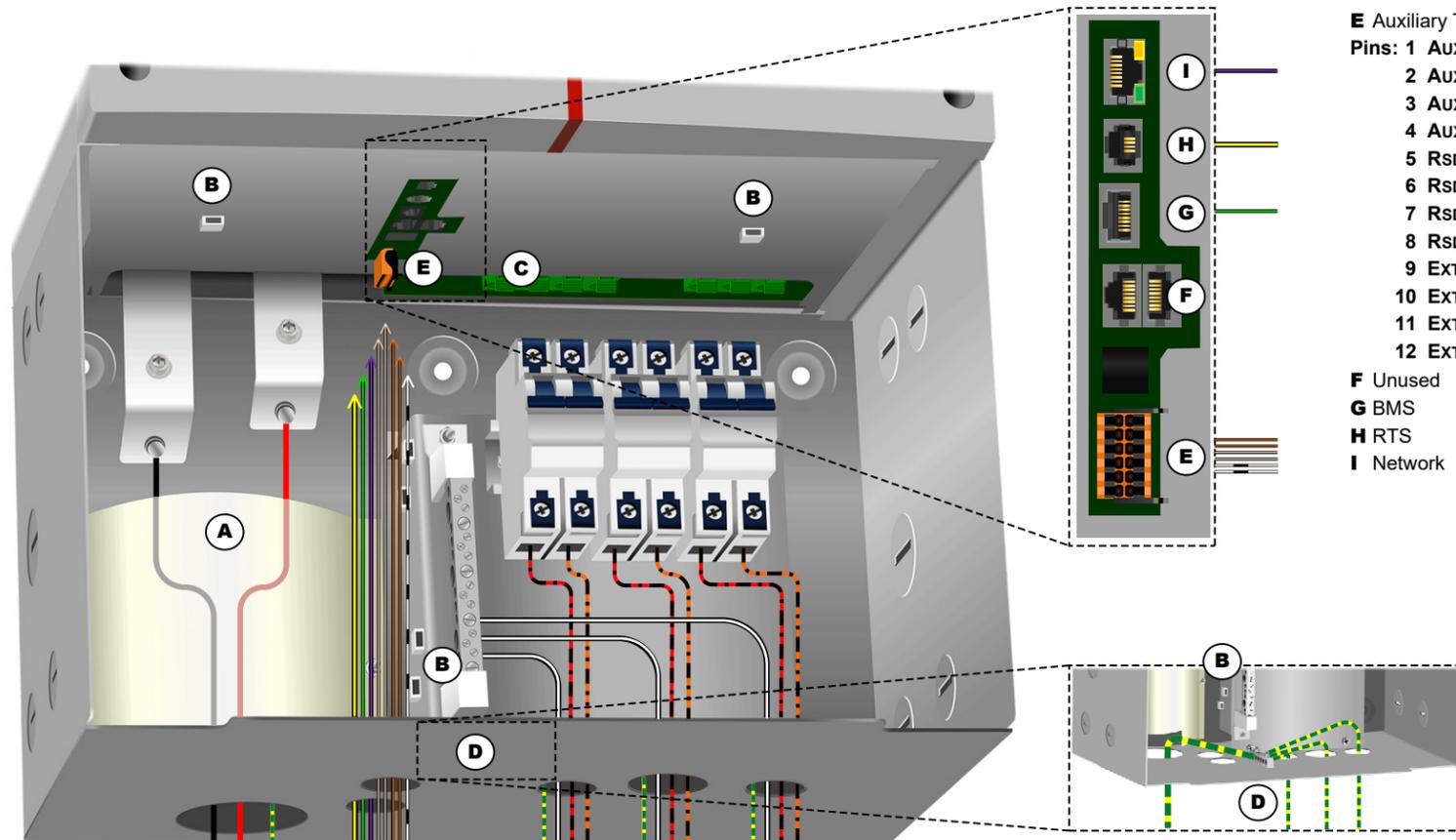
IMPORTANT

- ❖ Before using this system, overcurrent protection of 250 Adc must be installed on the main battery conductor. A separate battery disconnect may be required in the system.
- ❖ Route the battery cables underneath the plastic shield **A**.
- ❖ The AC connections are not bonded to ground. The customary location for a neutral-ground bond is at the main AC service panel. Make sure to establish a neutral-ground bond when installing in an off-grid application. Make sure that no more than one neutral-ground bond is present in any system.
- ❖ The battery connection is not bonded to ground. Make sure to establish a negative-ground bond for each battery system. Make sure that no more than one negative-ground bond is present in any system.
- ❖ Connect all ground wires to the **GROUND TBB**, which is not visible in the main image. See **D**.
- ❖ The Mojave inverter will not function unless a jumper or device is installed on **Aux** terminals **5** and **6** at **E**. It will show a **Rapid Shutdown** message.
- ❖ Current transducers (CTs) are installed at the main AC panel as in **J**. Install the L1 and L2 wires into **Aux** terminals at **E**. (White wires use terminals **9** and **11**; black wires use terminals **10** and **12**.) Available length is 8' (2.5 m).
NOTE: A CT is labeled as oriented toward the "source". "Source" is defined as the inverter, NOT the utility grid. (A separate labeled arrow shows the location of the utility grid.) Orient each CT accordingly for correct current readings.
NOTE: The L2 CT wiring is not depicted in this image.
- ❖ If a grid-direct (GD) inverter is used for AC coupling applications, it must be installed on the protected loads panel as shown in **K**.
- ❖ For batteries with a separate battery management system (BMS): The BMS connects to the **BAT MON** port **G**. Do not insert the RTS or any other cable into the **BAT MON** port.
- ❖ For lead-based batteries (no BMS): Connect the remote temperature sensor (RTS, purchased separately) to port **H**. Attach it on a battery sidewall near the center of the bank. The RTS is not used with lithium-ion batteries.
- ❖ Secure all CT, RTS, BMS, and similar cables using cable-ties inserted into the fittings at **B**. These cables must not be able to touch any battery or AC conductors.

| AC LEGEND | |
|-----------|----|
| Neutral | N |
| HOT L1 | L1 |
| HOT L2 | L2 |
| Ground | ⊕ |

| DC LEGEND | |
|-----------|---|
| Negative | ⊖ |
| Positive | ⊕ |
| Ground | ⊕ |

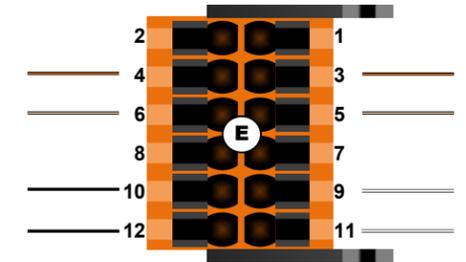
Mojave Battery



E Auxiliary Terminal Block

- Pins:
- 1 Aux 12V+
 - 2 Aux 12V GND
 - 3 AUX RELAY 2
 - 4 AUX RELAY 1
 - 5 RSD INPUT 1
 - 6 RSD INPUT 2
 - 7 RSD OUTPUT 1
 - 8 RSD OUTPUT 2
 - 9 EXT CT 1+
 - 10 EXT CT 1-
 - 11 EXT CT 2+
 - 12 EXT CT 2-

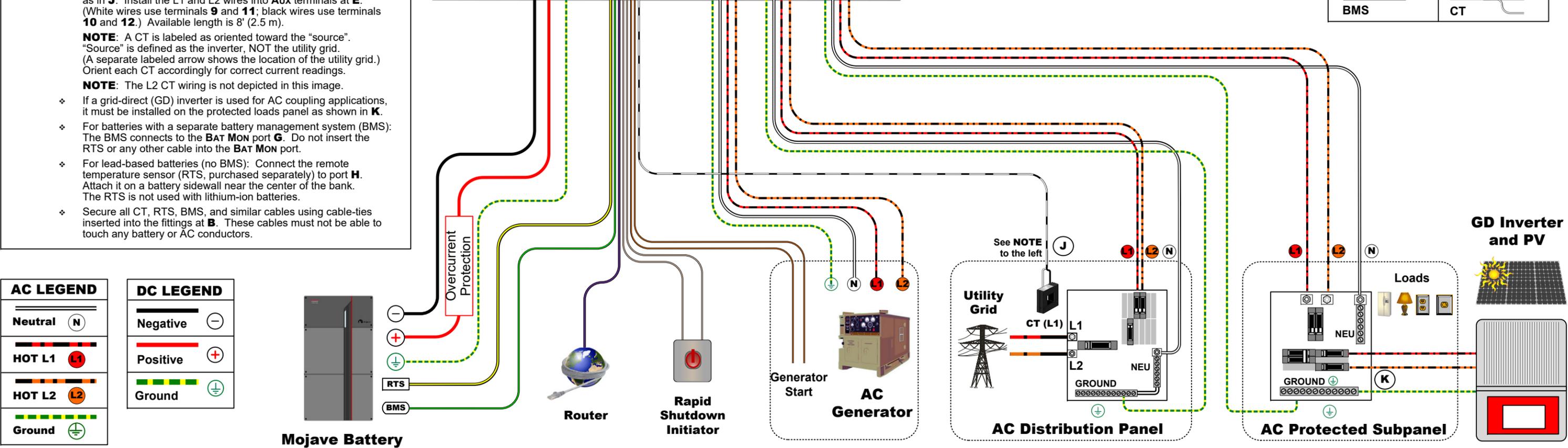
- F Unused
G BMS
H RTS
I Network



NOTES:

- ❖ The **Aux** terminal block, item **E**, is located alongside the other communications ports. It extends down into the wiring compartment.
- ❖ To install a wire, push on the release next to it (the square black area) with a tool and insert the wire into the opening.
- ❖ To remove a wire, push on the release with a tool while pulling on the wire.
- ❖ The wire may be installed more easily by pushing on the release with a tool while inserting the wire.
- ❖ The entire terminal block can be unplugged from the inverter to make this task easier. The black bars (above and below **E**) are levers. When moved from the vertical position, they will push the terminal block out of its socket.

| COMMUNICATIONS LEGEND | |
|-----------------------|----------------|
| RTS | Gen Start |
| Network | Rapid Shutdown |
| BMS | CT |



Commissioning

NOTES

- ❖ Directory plaques for all service equipment identifying all electric power sources shall be provided in the installation as required by NEC 705, 706 and 710.
- ❖ The steps shown here assume the use of a generator and the installation of a **GEN** circuit breaker at **4**.
- ❖ The steps shown here assume knowledge of the online user interface (UI). For more information, see the *Operator's Manual*.
- ❖ If any onscreen faults or other problems occur during commissioning, see the **Troubleshooting** section of the *Operator's Manual*.

Pre-startup Procedures:

1. Open the door and remove the dead front panel as depicted on the opposite sheet.
2. Double-check all wiring connections. Using a digital multimeter (DMM), test for continuity between **(3)** and **(7)** (item **D** in the **Wiring** section). Ensure that a neutral-ground bond is installed in the system.
3. Inspect the wiring compartment. Ensure no debris or tools were left inside.
4. Ensure all AC loads at the backup (or protected) load panel are disconnected.
5. Ensure all AC input feeds to the wiring compartment are disconnected at each source.
6. Check all other elements of the system including batteries, grid source, generator, etc. Ensure voltages and polarities are correct. Ensure all connections are tight. Check any other aspects of this installation.
7. Energize the system as below. Follow the procedures which are applicable to the system. If any elements are not present, ignore those procedures.

CAUTION: Equipment Damage

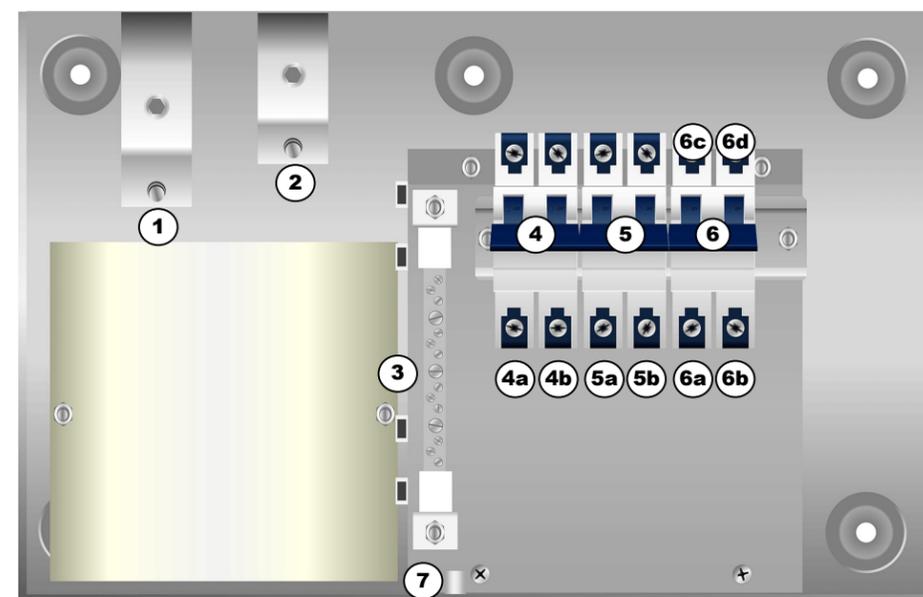
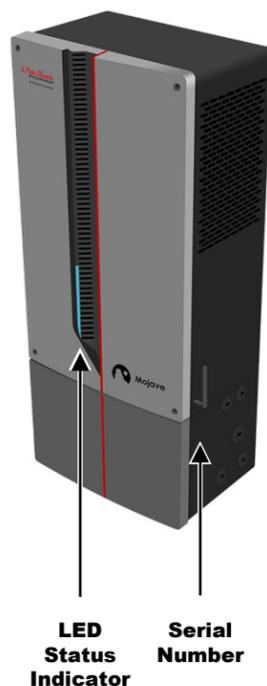
Incorrect battery polarity will damage the equipment.

NOTE

Do not close the **LOAD**, **GRID**, or **GEN** circuit breakers, or the main battery disconnect, at this stage.

To energize the Mojave inverter:

1. Verify battery voltage using a DMM prior to closing the main disconnect. Confirm correct polarity.
2. Once proper voltage and polarity are confirmed, turn on (close) the main disconnect. Power-up may require up to 1 minute. Verify battery input 48 Vdc at the inverter by measuring from **(1)** to **(2)**.
The LED status indicator will flash blue. Once the inverter is powered up, the indicator will be solid blue.
3. Check the tablet, smartphone, or other device that will be used for access. A new wi-fi connection will appear after power-up. It appears as "Mojave-xxxx" and incorporates part of the inverter's serial number. Connect to the device. When prompted for a password, the default password consists of the last eight digits of the inverter's serial number. (See above for the location of the serial number.) In a new browser window, enter the inverter's IP address, which is 192.168.2.2. This will open the UI.
Once the UI is open, an overlay will appear. The viewer can use it to "tour" available screens and options. Buttons will appear for the **Previous** or **Next** screen.
On initial power-up, the the inverter will be operating under the factory default settings. Before proceeding, ensure **Battery Model** and **Grid Profile** are set appropriately for the system. See the *Operator's Manual* for more information.
4. In the **ACTIONS** view, set the **Grid Input** switch to **Drop**. Set **Inverter** to **On**. In the UI, the inverter icon will turn green.
NOTE: Any **Action Menu** settings are retained after losing battery power. For example, **Inverter** will resume in the **On** state.
5. Using a DMM, verify the inverted **L1** output 120 Vac on the upper **LOAD** terminals from **(6c)** to **(3)**. Verify **L2** by measuring from **(6d)** to **(3)**.
6. Verify 240 Vac across the **LOAD** terminals by measuring from **(6c)** to **(6d)**.
7. Turn on (close) the **LOAD** circuit breaker **(6)**. Do not connect loads at the protected load panel.



NOTE: Shutting Down

In general, there is no required shutdown order. It is common to de-energize circuits in the reverse order from which they were energized.

An exception is when disconnecting the battery for any reason. Before disconnection, make certain all AC sources are shut down. This includes AC coupling if present. This removes any possible voltage increases on the internal circuitry in the absence of the battery.

WARNING: Shock Hazard

Before performing maintenance, all sources (battery, AC, and grid-direct inverter) must be completely de-energized for at least five minutes.

8. Verify 120 Vac on **LOAD L1** by measuring with a DMM from **(6a)** to **(3)**. Verify **L2** by measuring from **(6b)** to **(3)**.
9. Verify 240 Vac across the **LOAD** terminals by measuring from **(6a)** to **(6b)**.
10. Connect and test loads at the protected load panel.
11. **To test grid interaction:** Turn on the grid connection at the main distribution panel.
12. Verify 120 Vac on **GRID L1** by measuring with a DMM from **(5a)** to **(3)**. Verify **L2** by measuring from **(5b)** to **(3)**.
13. Verify 240 Vac across the **GRID** terminals by measuring from **(5a)** to **(5b)**.
14. Open the online user interface. In the **ACTIONS** view, set the **Grid Input** switch to **Use**.
15. Turn on (close) the **GRID** circuit breaker **(5)**. Wait for the programmed connection delay to elapse. The timer is displayed in the UI. When the inverter begins interacting with the grid power, the grid icon in the UI turns green.
16. Using a DMM, test the pass-through (transferred) **L1** output voltage at **(6c)** and **(3)**. Test the **L2** voltage at **(6d)** and **(3)**.
17. **To test generator interaction:** Turn off (open) the **GRID** circuit breaker **(5)**.
18. Start the generator manually. **NOTE:** These steps do not test the automatic generator start (AGS) function. See the *Operator's Manual* for more information.
19. Set the **Gen Input** switch to **Use**. Do not turn on (close) the **GEN** circuit breaker **(4)**.
20. Repeat steps 11 and 12 using **(4a)**, **(4b)**, and **(3)**.
21. Turn on (close) the **GEN** circuit breaker **(4)**. The **LOAD** circuit breaker should remain on (closed). Repeat step 15.
22. Stop the generator.
23. Turn on (close) the **GRID** circuit breaker **(5)**. Wait for the programmed connection delay to elapse. The grid icon should turn green.
24. As appropriate to the installation: In the **ACTIONS** view, set **Bulk Charge** to **Bulk Start** and test battery charging. Test AGS, load checks, AC Coupling functionality, and any other relevant aspects of this installation. In the UI, make any additional changes to items that should not be left at the factory default settings.
25. To connect the inverter to an external network, go to the **Network** tab (under the **SETTINGS** view) and enable the desired connection method, whether **Wireless_Connection** or **Wired_Connection**.
 - If wireless, choose the appropriate network in the **SSID** field.
 - If a physical connection is desired, connect an Ethernet cable to port **I** (see the opposite side of this sheet) and choose the appropriate **Wired_Connection** settings.