Configuration Wizard

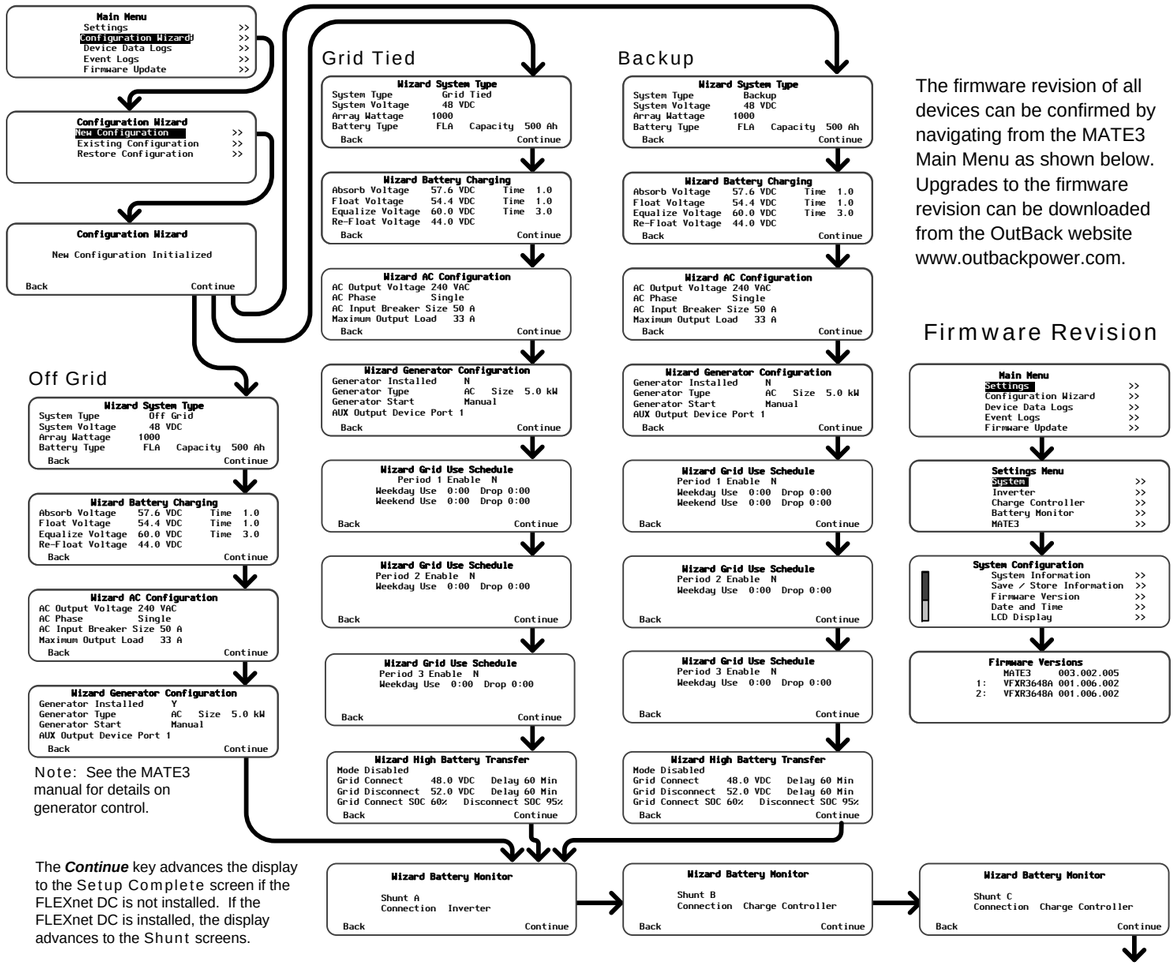
The MATE3 Configuration Wizard allows quick setup of parameters that apply to all systems. The Configuration Wizard is reached from the MATE3 Main Menu as shown below.

CAUTION: Equipment Damage

These procedures should be done by a qualified installer who is trained on programming inverter power systems. Failure to set accurate parameters for the system could potentially cause equipment damage. Damage caused by inaccurate programming is not covered by the limited warranty for the system.

IMPORTANT

Check the firmware revision of all OutBack devices before use. The MATE3 system display must be revision 003.002.xxx or higher. If the revision is lower, the MATE3 and inverter may not communicate or operate correctly.



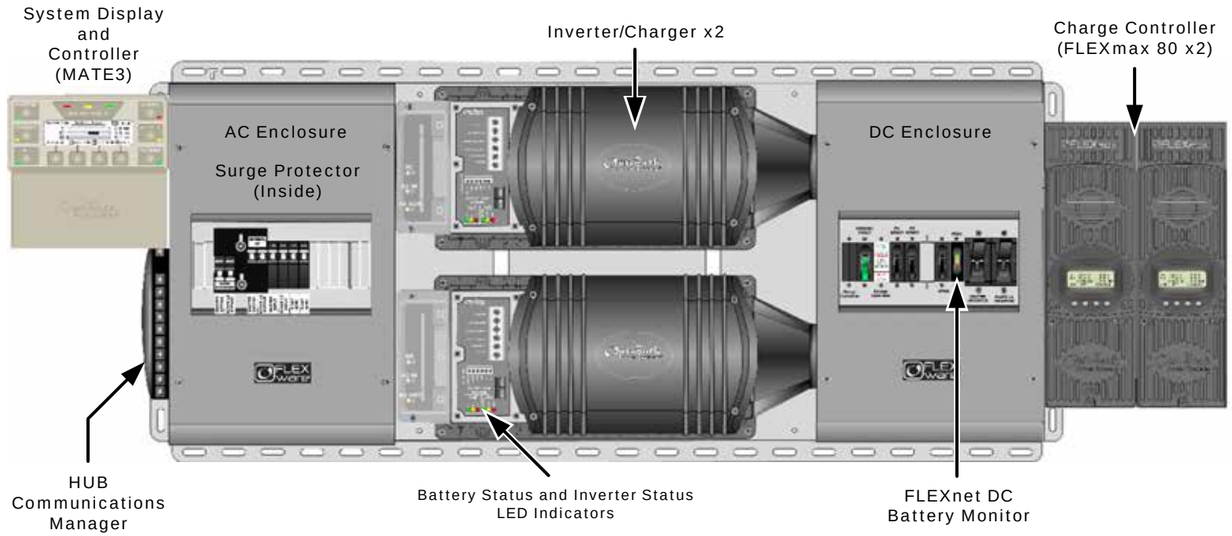
Note: See the MATE3 manual for details on generator control.

The ***Continue*** key advances the display to the Setup Complete screen if the FLEXnet DC is not installed. If the FLEXnet DC is installed, the display advances to the Shunt screens.

The firmware revision of all devices can be confirmed by navigating from the MATE3 Main Menu as shown below. Upgrades to the firmware revision can be downloaded from the OutBack website www.outbackpower.com.

Firmware Revision

Supports the OPTICS RE™ online tool for a cloud-based remote monitoring and control application. Please refer to the OPTICS RE setup instructions, or visit www.outbackpower.com to download.



Major Components

FLEXpower System Products
Inverter/Chargers (x2)
AC Conduit Box (with Bypass Assembly)
DC Enclosure Box (with Inverter Circuit Breaker)
System Display and Controller
Charge Controller
Communications Manager
Balancing Transformer
FLEXnet DC Monitor (FN-DC)
Surge Protector
Remote Temperature Sensor (RTS)

Customer-Supplied Components	
AC Source	**Utility Grid or AC Generator**
Main Electrical Panel (or overcurrent device for the AC source)	
Electrical Distribution Subpanel (Load Panel)	
Battery Bank	
Photovoltaic (PV) Array (with PV Combiner Box)	

FN-DC LED Indicators

Color	Battery State-of-Charge
Green	> 90% (blinks if charge parameters are met)
Yellow	≥ 80%
Yellow	≥ 70%
Yellow	≥ 60%
Red	≥ 60% off, < 60% solid, < 50% blinks

LED Indicators on the Inverter

Battery Status LED Indicators			
Color	12 V Inverter	24 V Inverter	48 V Inverter
Green	12.5 Vdc or higher	25.0 Vdc or higher	50.0 Vdc or higher
Yellow	11.5 to 12.4 Vdc	23.0 to 24.8 Vdc	46.0 to 49.6 Vdc
Red	11.4 Vdc or lower	22.8 Vdc or lower	45.6 Vdc or lower

Inverter Status LED Indicators	
Green	Inverter on (solid) or standing by (flash)
Yellow	AC source in use (solid) or standing by (flash)
Red	Inverter error or warning (see manual)

Surge Protector LEDs

Active	Error	Phase
Yellow	Red	DC
Yellow	Red	AC IN
Yellow	Red	AC OUT

IMPORTANT:
Not intended for use with life support equipment.

OPTICS RE Compatible

Contact Technical Support:
Telephone: +1.360.618.4363
Email: Support@outbackpower.com
Website: www.outbackpower.com

OutBack POWER™
member of The alpha Group™

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Mounting

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.

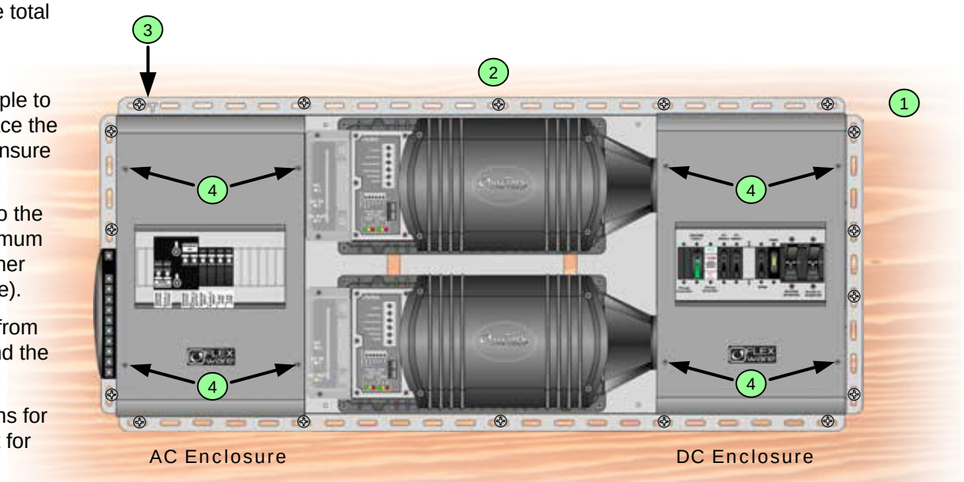
IMPORTANT:
Clearance and access requirements may vary by location. Maintaining a 36" (91.4 cm) clear space in front of the system for access is recommended. *Consult local electric code to confirm clearance and access requirements for the specific location.*

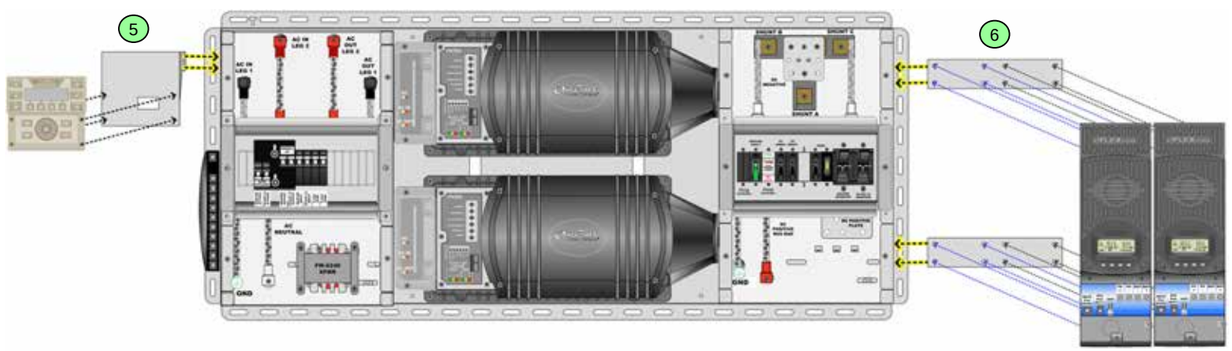
FP2 Mounting:

1. Ensure the mounting surface is strong enough to handle 3 times the total weight of all the components.
2. Using additional people to assist with lifting, place the panel on the wall. Ensure the panel is level.
3. Secure the panel into the surface using a minimum of 10 lag bolts (or other appropriate hardware).
4. Remove the covers from the AC Enclosure and the DC Enclosure.
5. Follow the instructions for installing the bracket for the MATE3.
6. Follow the instructions for installing the brackets for the charge controllers.

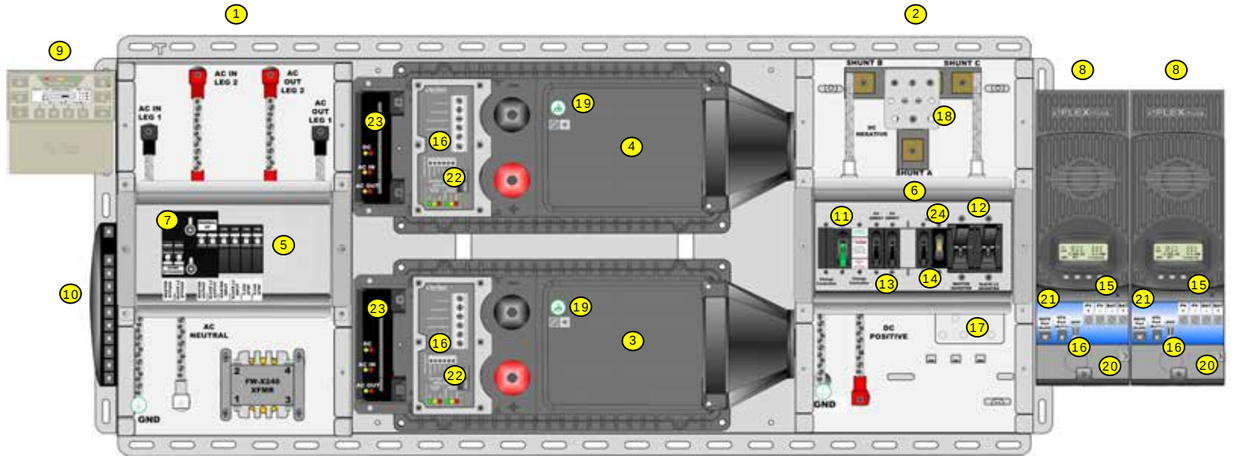
FP2 Dimensions:

20.25" (51.4 cm) H X 36.5" (92.6 cm) W X 13.5" (34.3 cm) D





Wire Sizes/Torque Requirements



1. **AC Enclosure**
2. **DC Enclosure**
3. **Master Inverter**
4. **Slave Inverter**
5. **AC Circuit Breakers**
6. **DC Circuit Breakers**
7. **Mechanical Interlock (Bypass)**
8. **FLEXmax 80 Charge Controller**
9. **MATE3 System Display and Controller**
10. **Communication Manager HUB10**
11. **GFDI**
12. **Inverter DC Circuit Breakers**
13. **PV Input Circuit Breakers**
14. **FLEXnet DC (FN-DC)**
15. **Charge Controller Terminals**
16. **AUX Control Terminals**
17. **DC Positive (+) Plate**
18. **DC Negative (–) Plate**
19. **Inverter Chassis Ground**
20. **Charge Controller Chassis Ground**
21. **CC Communication Ports**
22. **Inverter Communication Ports**
23. **Surge Protector**
24. **FN-DC Communication Port**

AC Wire Sizes and Torque Values

Wire Size		Torque	
AWG	mm²	In-lb	Nm
#14 - 10	2.5 – 6	20	2.3
#8	10	25	2.8
#6 - 4	16 – 25	35	4.0
#3	35	35	4.0
#2	35	40	4.5
#1	50	50	5.6
1/0	70	50	5.6

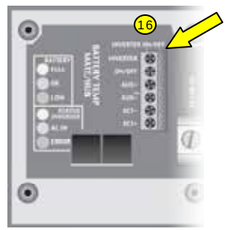
OutBack recommends that conductors be #6 AWG THHN copper, or larger, rated to 75°C (minimum) unless local code requires otherwise.

Torque requirements for the conductor lugs

Circuit Breaker Stud	Torque	
	In-lb	Nm
M8	20	2.3
¼ - 20	35	4.0
5/16 - 18	50	5.6
3/8 - 16	225	25.4

Minimum DC Cable based on the DC Circuit Breaker

DC Circuit Breaker	Cable Size	Torque	
		In-lb	Nm
60	#6 AWG (16 mm²)	35	4.0
80	#4 AWG (25 mm²)	35	4.0
125	1/0 (70 mm²)	50	5.6
175	2/0 (70 mm²)	225	25.4
250	4/0 (120 mm²)	225	25.4



Control Wiring Terminal Block:

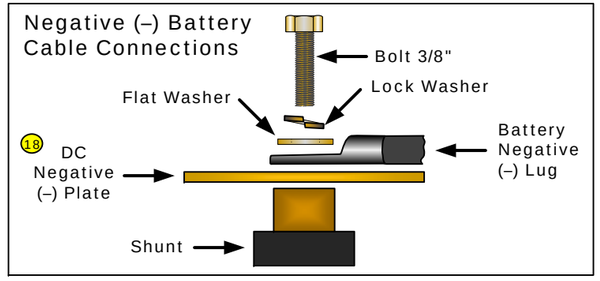
The Inverter ON/OFF terminals are used for connecting an external ON/OFF switch. To use this feature, the jumper must be removed. (See installation manual for details.)

The AUX terminals provide a 12 Vdc signal. The AUX terminals can be used to start a generator or to control external devices.

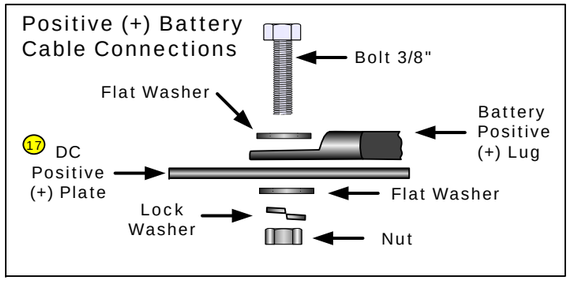
AUX terminals are also available on the charge controller and the FLEXnet DC. (See the charge controller or FNDC installation manuals for details.)

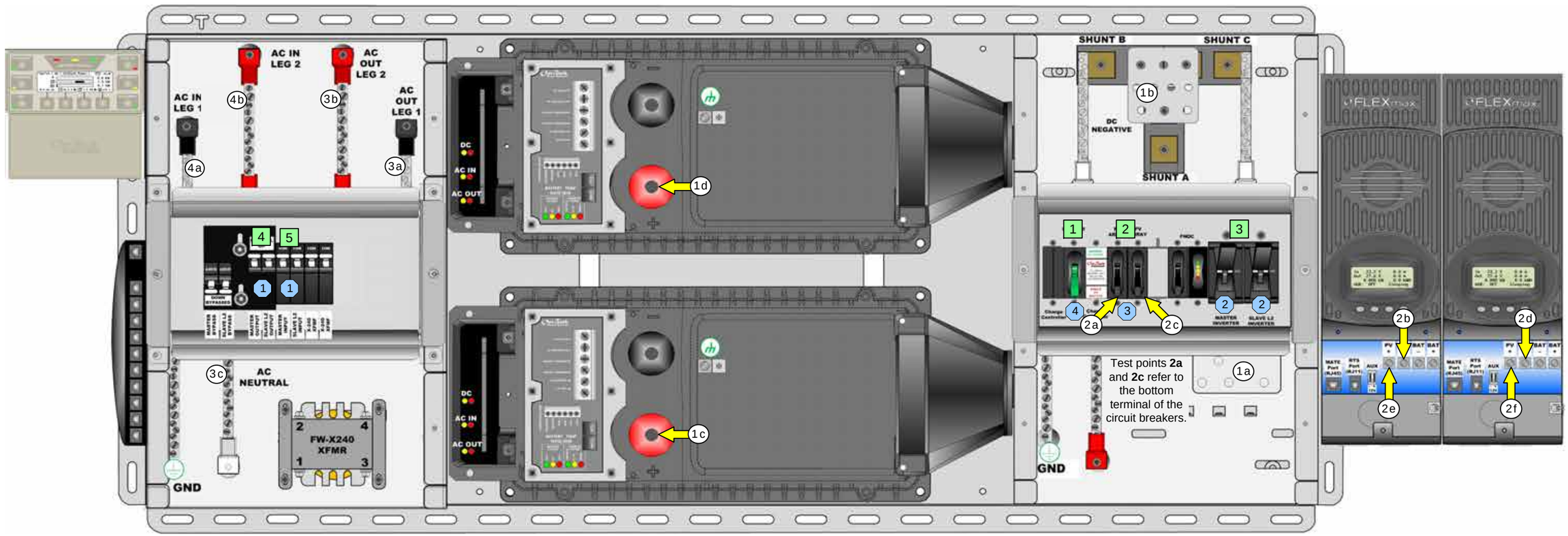
CAUTION: Equipment Damage
When connecting cables from the inverter to the battery terminals, ensure the proper polarity is observed. Connecting the cables incorrectly can damage or destroy the equipment and void the product warranty.

Negative (–) Battery Cable Connections



Positive (+) Battery Cable Connections





Pre-startup Procedures

After opening the AC and DC enclosures:

1. Double-check all wiring connections.
2. Inspect the enclosure to ensure no tools or debris has been left inside.
3. Disconnect AC loads at the load panel.
4. Disconnect AC inputs at the source.
5. Place the mechanical interlock in the normal (non-bypass) position.

Functional Test Points

Battery Voltage Test Points 1a 1b 1c 1d
PV Voltage Test Points 2a 2b 2c 2d 2e 2f
AC OUT Voltage Test Points (Terminal bus bar = TBB) 3a 3b 3c
AC IN Voltage Test Points (Terminal bus bar = TBB) 4a 4b 3c

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To energize or start up the OutBack devices:

1. Using a digital voltmeter (DVM), verify 12, 24, or 48 Vdc on the DC input terminals by placing the DVM leads on 1a and 1b. Confirm that the voltage is correct for the inverter and charge controller models. **Confirm the polarity**.
2. Verify that the PV output for each charge controller is in the correct range of open-circuit voltage and confirm the polarity by:
   a) placing the DVM leads on 2a and 2b, and
   b) placing the DVM leads on 2c and 2d.
3. Verify 120/240 Vac on the terminals of the AC source and connect the source.
4. Verify 120 Vac on the AC Input L1 TBB by placing the DVM leads on 4a and 3c.
5. Verify 120 Vac on the AC Input L2 TBB 4b and 3c.
6. Verify 240 Vac between the AC Input TBBs by placing the DVM leads on 4a and 4b.
7. Turn on (close) the GFDI circuit breaker. 1
8. Turn on (close) the PV input circuit breakers. 2
9. Turn on (close) the DC circuit breakers from the battery bank to the inverter. 3
10. Check the system display or LED indicators. Ensure the inverter is in the ON state. The factory default state for FXR inverters is OFF.
11. Turn on (close) the FN-DC circuit breaker.
12. Turn on (close) the AC output circuit breakers. 4
13. Verify 120 Vac on the AC Output L1 TBB by placing the DVM leads on 3a and 3c.
14. Verify 120 Vac on the AC Output L2 TBB 3b and 3c.
15. Verify 240 Vac between the AC Output TBBs by placing the DVM leads on 3a and 3b.

NOTE: Assumes correct stacking programming with the Configuration Wizard.

16. Replace the covers on the AC and DC enclosures.
17. Turn on (close) the AC input circuit breakers. 5
18. Turn on the AC disconnects at the load panel and test the loads.

CAUTION: Equipment Damage
Incorrect battery polarity will damage the equipment.

To de-energize or shut down the OutBack devices:

1. Turn off (open) the AC circuit breakers. 1
2. Turn off (open) the DC circuit breakers for the battery. 2
   Wait 5 minutes for the devices to internally discharge themselves.
3. Turn off (open) the PV circuit breakers. 3
4. Turn off (open) the GFDI circuit breaker. 4
5. Verify 0 Vdc on the DC input terminal of the master inverter by placing the voltmeter leads on 1b and 1c.
6. Verify 0 Vdc on the DC input terminal of the slave inverter by placing the voltmeter leads on 1b and 1d.
7. Verify 0 Vdc on the PV terminals of one charge controller by placing the voltmeter leads on 2b and 2e.
8. Verify 0 Vdc on the PV terminals of the other charge controller by placing the voltmeter leads on 2d and 2f.
9. Verify 0 Vac on the AC output circuit breakers by placing the voltmeter leads on 3a and 3c. Repeat this step for 3b and 3c.

WARNING: Lethal Voltage
Review the system configuration to identify all possible sources of energy. Ensure ALL sources of power are disconnected before performing any installation or maintenance on this equipment. Confirm that the terminals are de-energized using a validated voltmeter (rated for a minimum 1000 Vac and 1000 Vdc) to verify the de-energized condition.

WARNING: Lethal Voltage
The numbered steps will remove power from the inverter and charge controllers. However, sources of energy may still be present in the AC and DC wiring boxes. To ensure absolute safety, disconnect ALL power connections at the source.

WARNING: Burn Hazard
Internal parts can become hot during operation. Do not remove the cover during operation or touch any internal parts. Be sure to allow the parts sufficient time to cool down before attempting to perform any maintenance.

General Wiring

FLEXpower TWO

IMPORTANT: Example only. Actual wiring may vary depending on local electric code. Factory wiring is not shown.

MATE3

CAT5 Cable

AC IN LEG 1

AC IN LEG 2

AC OUT LEG 2

AC OUT LEG

AC NEU

FW-X240 XFMR

GND

SLAVE INVERTER

MASTER INVERTER

DC

AC IN

AC OUT

SHUNT B

SHUNT C

SHUNT A

DC NEGATIVE

DC POSITIVE

Charge Controller #1

Charge Controller #2

FLEXmax

GROUND FAULT

FAULT PV INACTIVE

PV ARRAY

FNDC

MASTER INVERTER

SLAVE L2 INVERTER

AC LEGEND

- Neutral (N)
- HOT L1 (L1)
- HOT L2 (L2)
- Ground

AC Distribution Panel

L1

L2

NEU

AC Source

Neutral-Ground Bond

GROUND

Loads (240 Vac)

AC Subpanel

Loads (120 Vac)

Ground Electrode Conductor

Ground Electrode System (Ground Rod)

RTS

Vented Battery Enclosure

Battery Bank

PV Combiner Box

PV Array #1

PV Array #2

DC LEGEND

- Negative (−)
- Positive (+)
- Ground