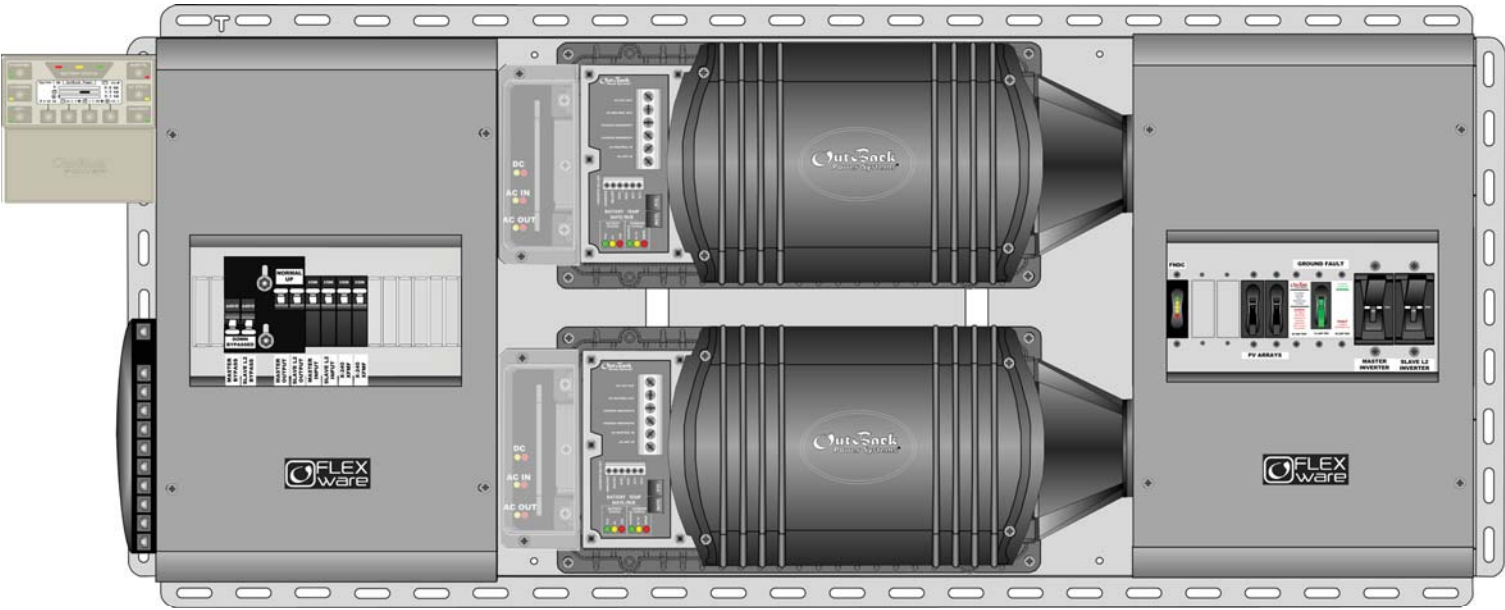
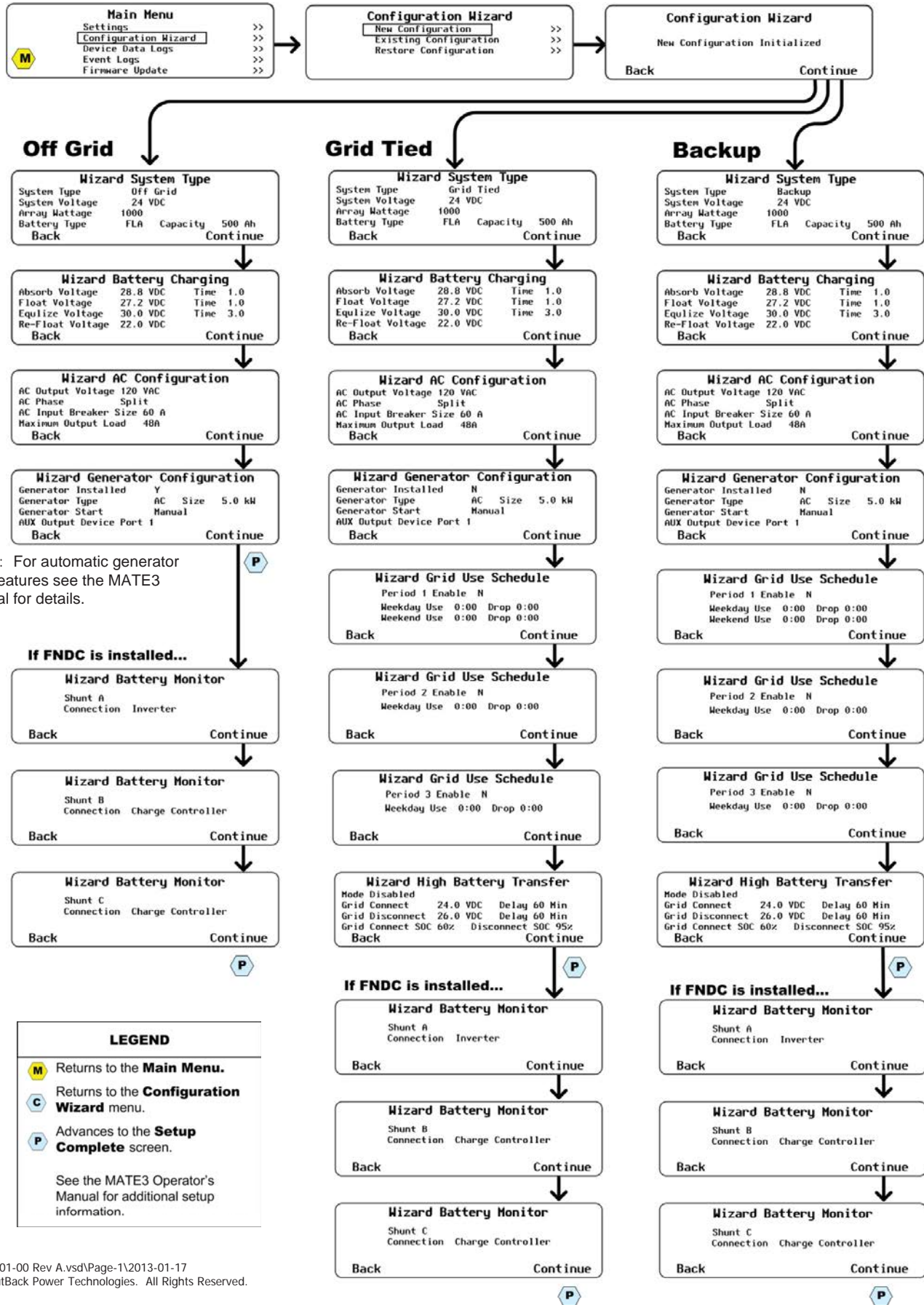








IMPORTANT:
Programming should be done by a qualified installer who is trained on programming inverter power systems. Failure to program accurate parameters for the system could potentially cause equipment damage. Damage caused by inaccurate programming is not covered by the limited warranty for the system.



Major Components	
FLEXpower System Products	
Inverter/Chargers (x2)	FX Series VFX Series GTFX Series GVFX Series GFX Series
AC Enclosure Box	FW500-AC
AC Bypass Assembly	FW-IOBD-120/240VAC FW-IOBD-120VAC
DC Enclosure Box	FW500-DC
Inverter Circuit Breaker	PNL-175-DC PNL-250-DC
System Display and Controller	MATE3 MATE2
Communications Manager	HUB10 HUB4
FLEXnet DC Monitor Surge Protector Remote Temp Sensor RTS	FNDC FW-SP-ACA

Optional OutBack Components	
Charge Controller	FLEXmax 80 FLEXmax 60
PV Combiner Box	PV8 PV12
Balancing Transformer	FW-X240

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)	

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

FNDC 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

IMPORTANT:
Not intended for use with life support equipment.



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



Mounting

Wire Sizes/Torque Requirements



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:

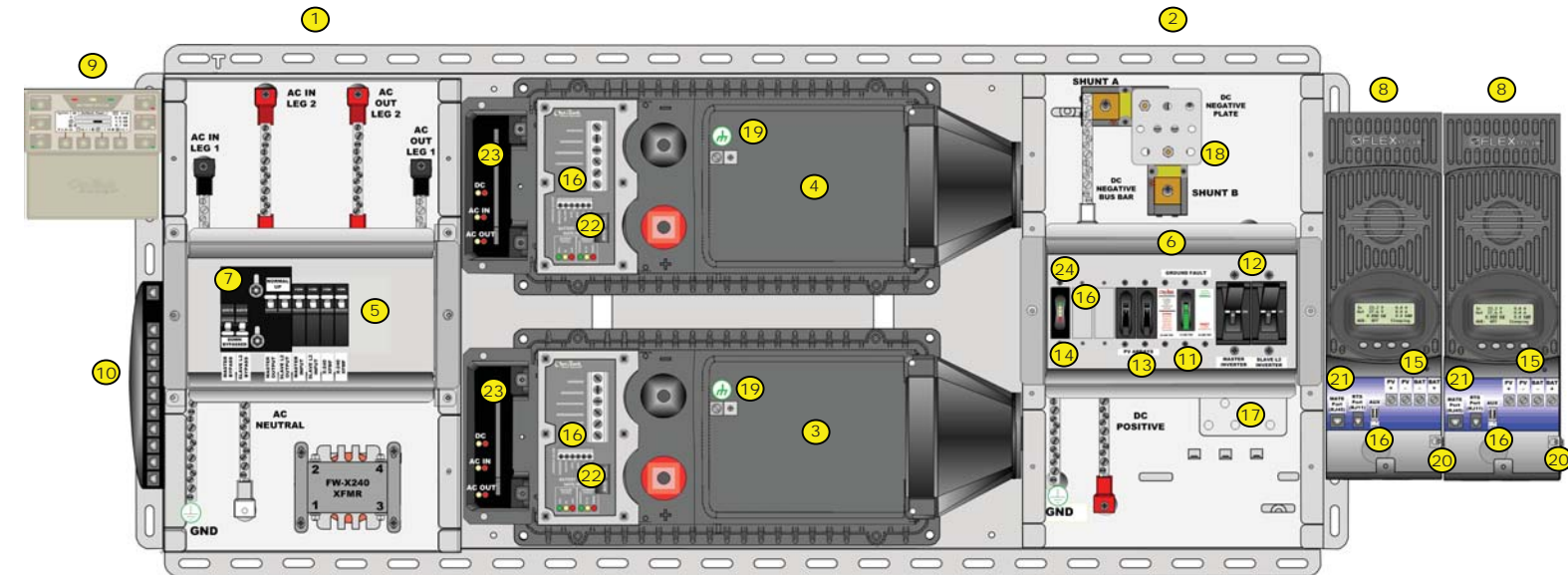
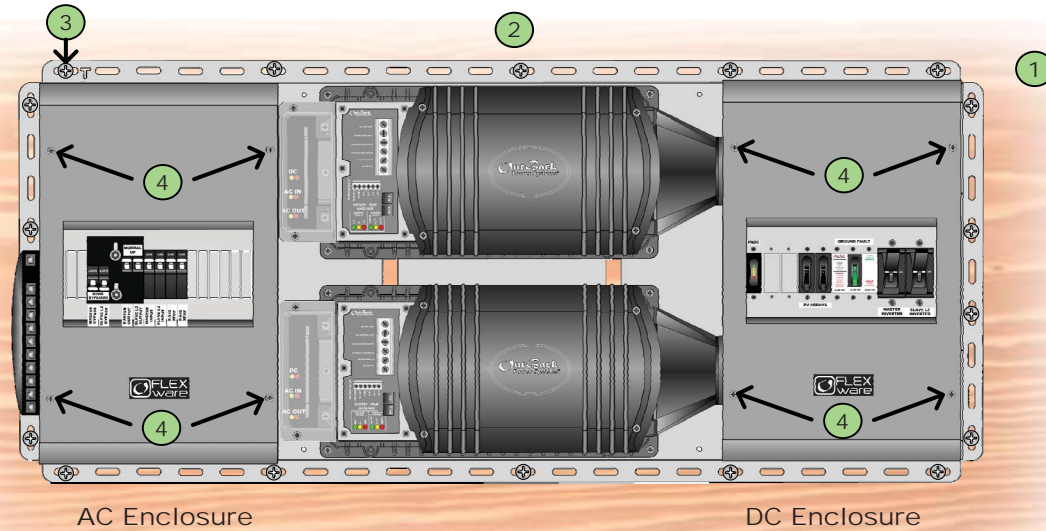
Clearance and access requirements may vary by location. Maintaining a 36" (91.4 cm) clear space in front of the system for access is recommended. *Consult local electric code to confirm clearance and access requirements for the specific location.*

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



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

AC Wire Sizes and Torque Values

Wire Size		Torque	
AWG	mm ²	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

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

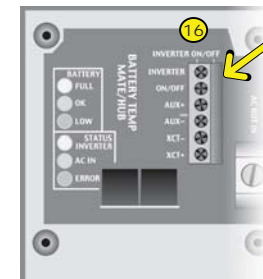
Torque requirements for the conductor lugs

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 mm ²)	35	4.0
80	#4 AWG (25 mm ²)	35	4.0
125	1/0 (70 mm ²)	50	5.6
175	2/0 (70 mm ²)	225	25.4
250	4/0 (120 mm ²)	225	25.4

Control Wiring Terminal Block:

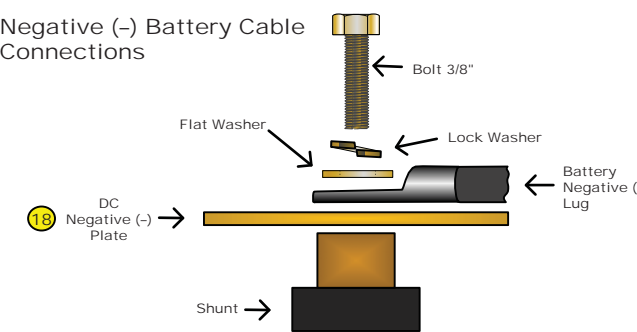


The Inverter ON/OFF terminals are used for connecting an external ON/OFF switch. To use this feature, the jumper must be removed. (See installation manual for details.)

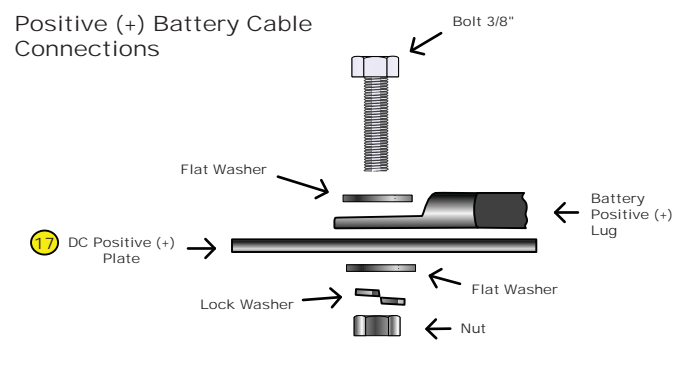
The AUX terminals provide a 12 Vdc signal. The AUX terminals can be used to start a generator or to control external devices.


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

Negative (-) Battery Cable Connections

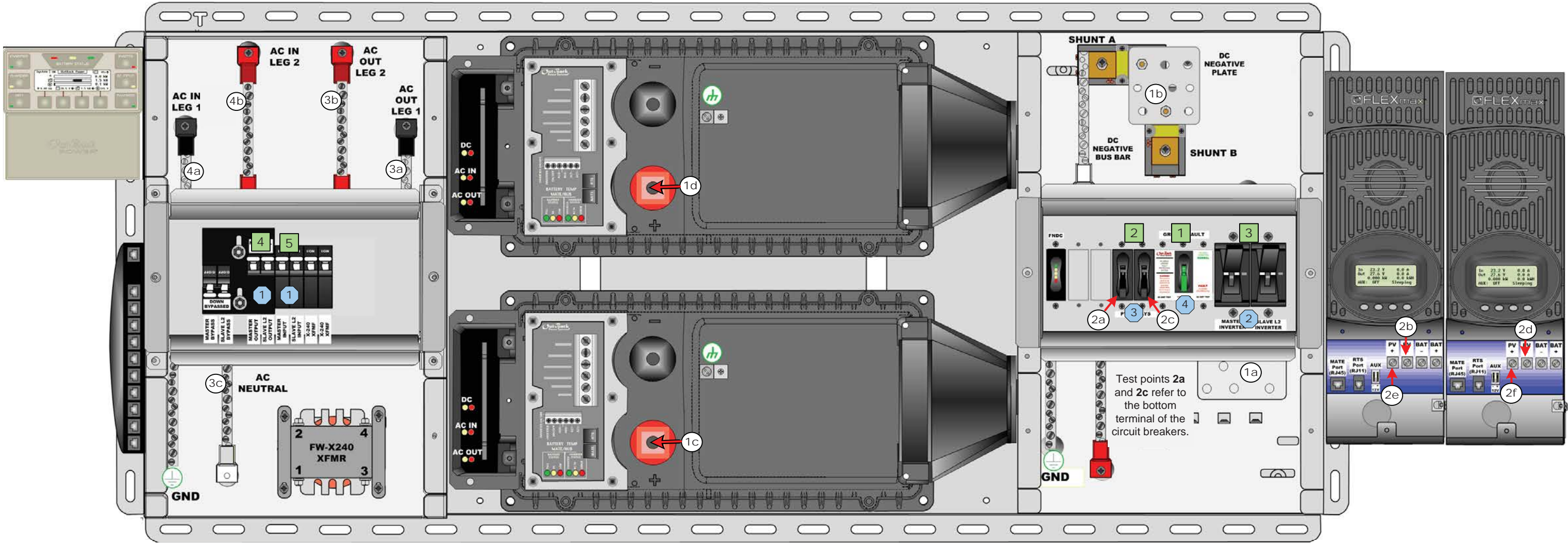


Positive (+) Battery Cable Connections



 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.



Pre-startup Procedures:

- 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.

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		

To energize or start up the OutBack devices:

- 1. Using a digital voltmeter (DVM), verify 12, 24, or 48 Vdc on the DC plates 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. Turn on (close) the GFDI circuit breaker. 1
- 3. 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 .
- 4. Turn on (close) the PV input circuit breakers. 2
- 5. Turn on (close) the DC circuit breakers from the battery bank to the inverter. 3
- 6. Verify 120 Vac on the AC Output L1 TBB by placing the DVM leads on 3a and 3c .
- 7. Verify 120 Vac on the AC Output L2 TBB 3b and 3c .
- 8. 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.
- 9. Turn on (close) the AC output circuit breakers. 4
- 10. Verify 120/240 Vac on the terminals of the AC source and connect the source.
- 10. Verify 120 Vac on the AC Input L1 TBB by placing the DVM leads on 4a and 3c .
- 11. Verify 120 Vac on the AC Input L2 TBB 4b and 3c .
- 12. Verify 240 Vac between the AC Input TBBs by placing the DVM leads on 4a and 4b .
- 13. Turn on (close) the AC input circuit breakers. 5
- 14. 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 .
- 7. Verify 0 Vdc on the PV terminals of the other charge controller by placing the voltmeter leads on 2d and 2f .
- 7. 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.

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

