



 **FLEXpower™ ONE**

**System Overview**

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## WARNING: SHOCK HAZARD

- This information is 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 240 Vac and 150 Vdc.
- Consult the *FLEXpower ONE Installation Manual* for detailed information on **safety** and **installation** procedures.

## Major Components

OutBack Power Technologies Products:

- Inverter/Charger (FX, VFX, GVFX or GTFX models)
- FW250-AC-120V-NA
- FW250-DC-125, FW250-DC-175, or FW250-DC-250
- System Display and Controller (MATE2 or MATE3)
- Charge Controller (FLEXmax 80 or FLEXmax 60)
- Remote Temperature Sensor (RTS)
- Communications Manager (HUB4 or HUB10)
- FLEXnet DC Monitor
- Surge Protector

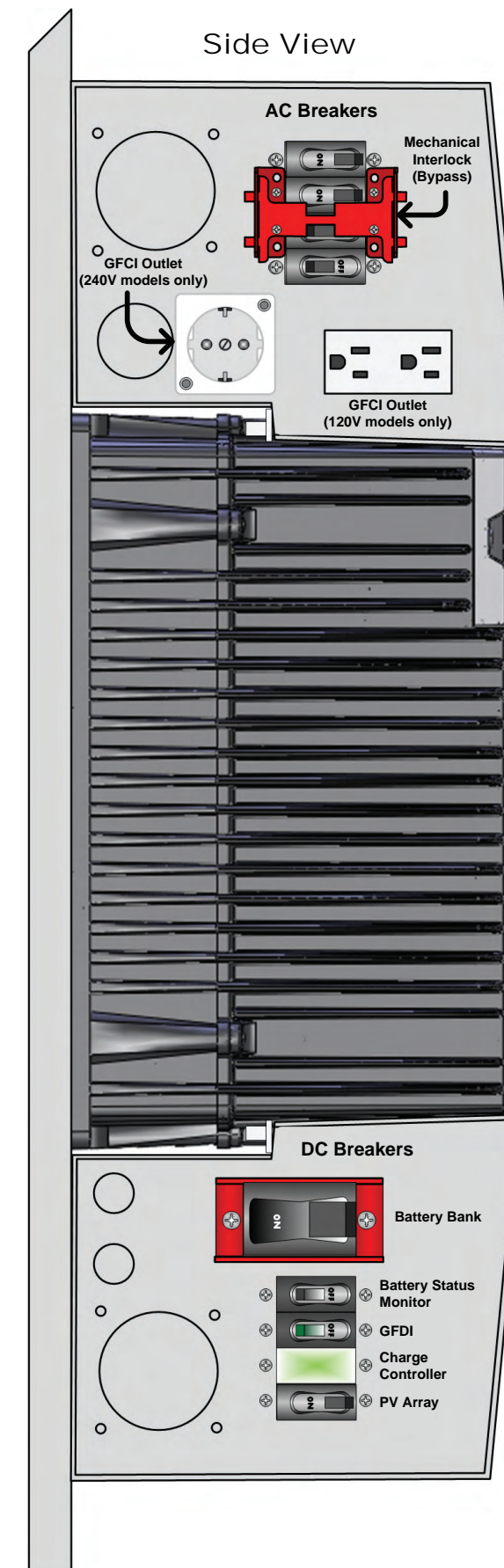
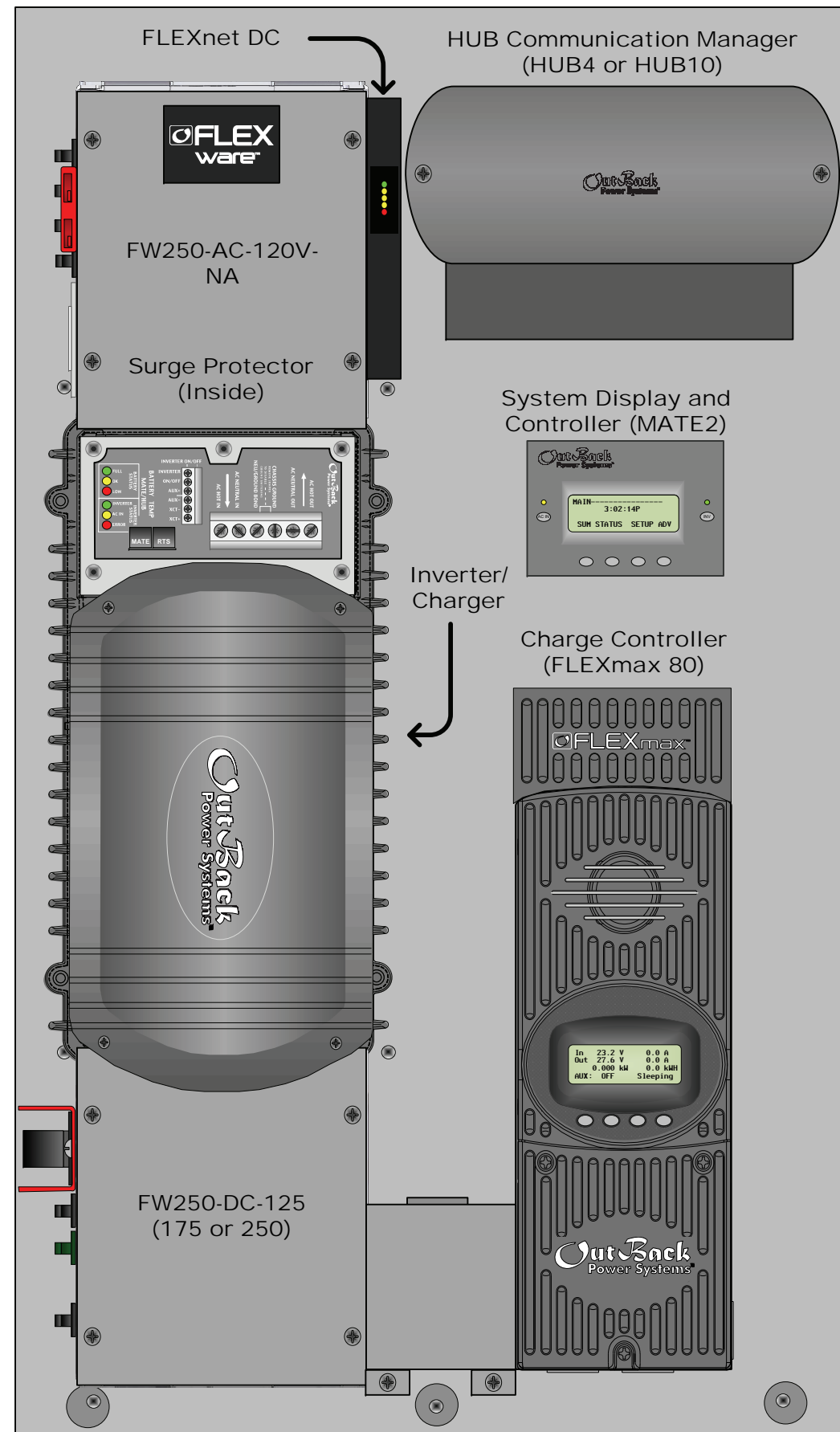
Customer Supplied Components:

- AC Source:
  - ~ Utility Grid (if available) or
  - ~ AC Generator with circuit breaker or overcurrent device
- Main AC Distribution Panel
- AC Distribution Sub-Panel (Load Panel)
- Battery Bank (24 or 48 Vdc)
- Photovoltaic (PV) Array and PV Combiner Box

Reference Documentation:

- FLEXpower ONE Installation Manual
- FX Inverter/Charger Installation Manuals
- FX Operator's Manuals
- MATE Series or MATE3 Owner's Manual
- HUB Owner's Manual
- FLEXmax Series Charge Controllers Owner's Manual
- FLEXnet DC Monitor Owner's Manual

**IMPORTANT:**  
All configurations must comply with local and national electric codes. Consult your local electric authority to ensure compliance. **Actual wiring requirements may vary. Factory wiring is not shown.**



### AC Wire Sizes and Torque Values

Wire Size		Torque	
AWG	mm <sup>2</sup>	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.

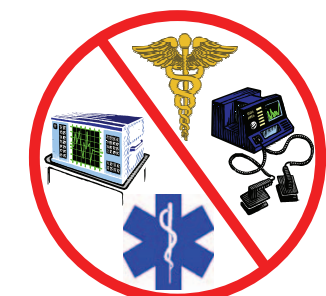
### Torque Data for Breaker Lugs

Breaker Stud	Torque	
	In-lb	Nm
M8	20	2.3
1/4 - 20	35	4.0
5/16 - 18	50	5.6
3/8 - 16	225	25.4

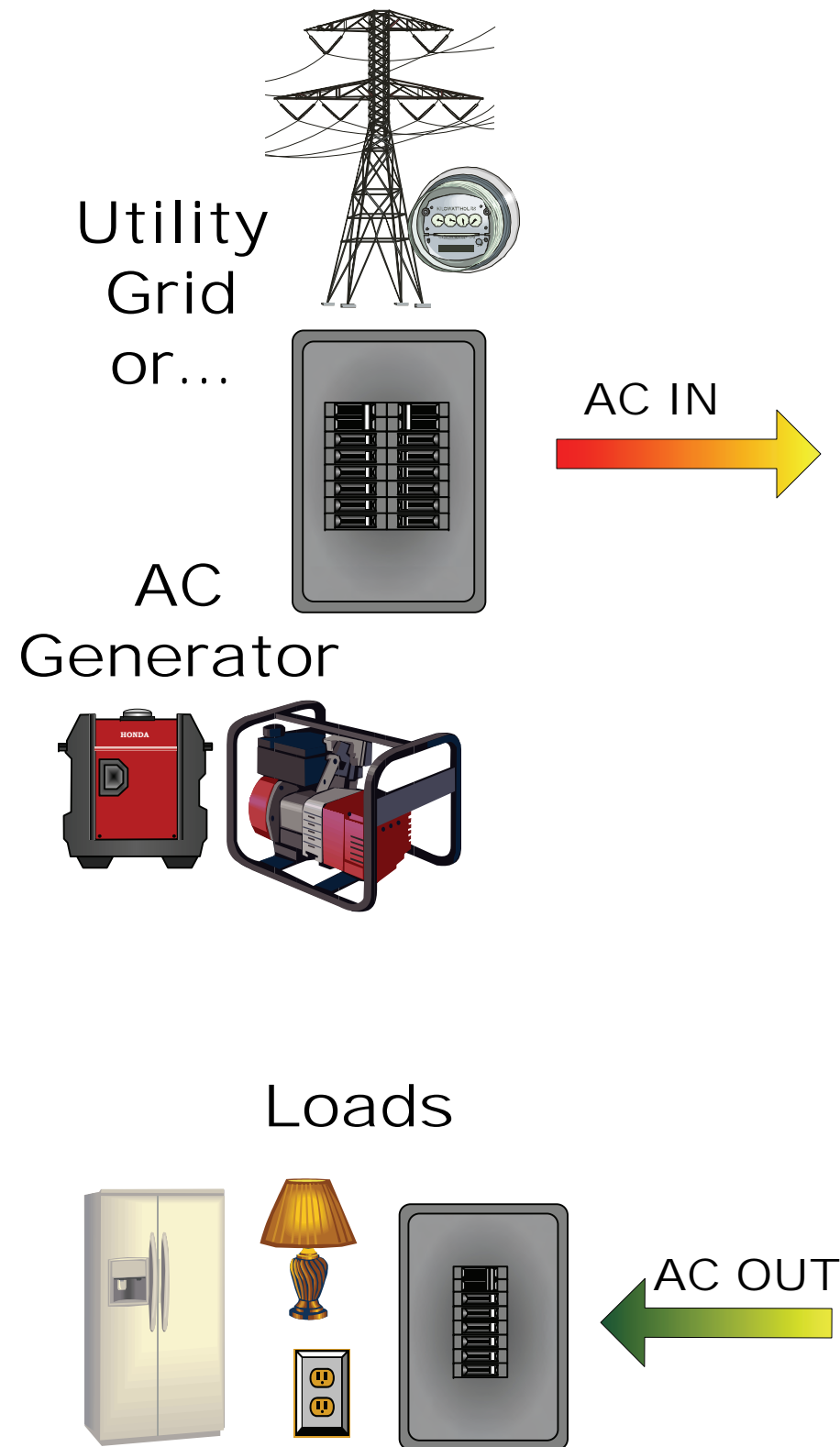
### Minimum DC Conductor based on DC Breaker

DC Breaker	Conductor Size	Torque	
		In-lb	Nm
125	1/0 (70 mm <sup>2</sup> )	50	5.6
175	2/0 (70 mm <sup>2</sup> )	225	25.4
250	4/0 (120 mm <sup>2</sup> )	225	25.4

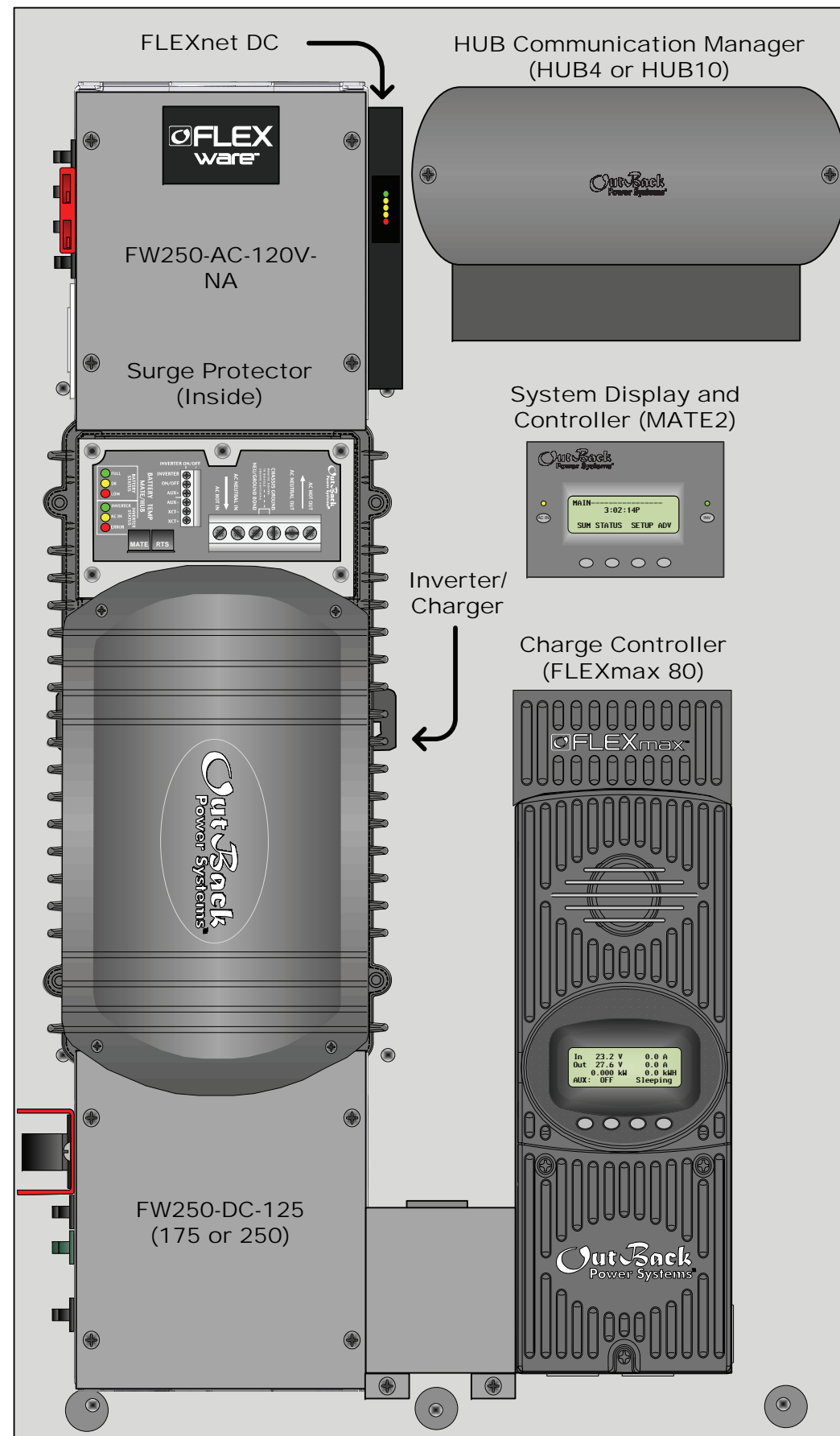
**IMPORTANT:**  
Not intended for use with life support equipment.







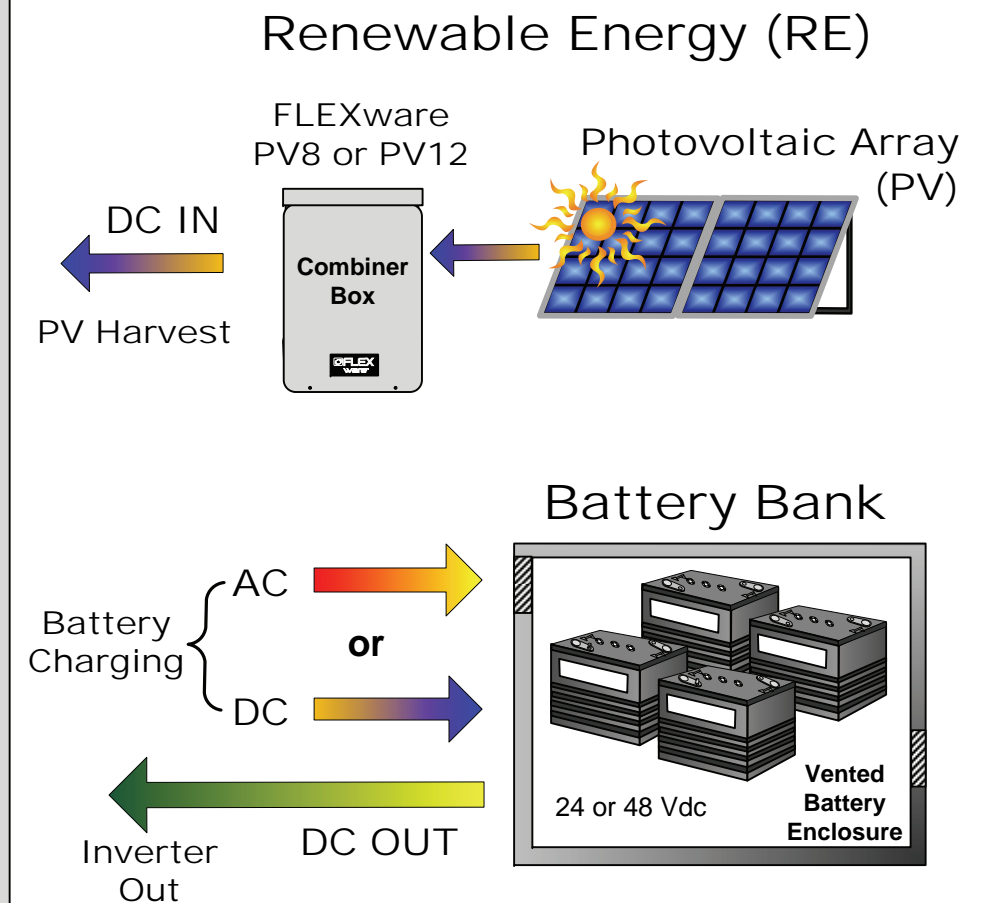
**IMPORTANT: Example only.** Actual configuration will vary depending on the specific installation requirements.



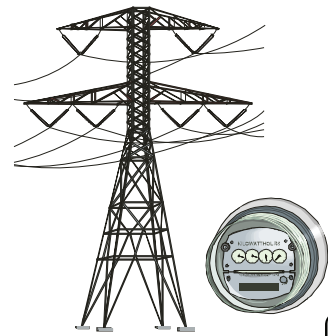
## Major Components

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- Inverter/Charger (FX or VFX models)
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  - Charge Controller (FLEXmax 80 or FLEXmax 60)
  - Remote Temperature Sensor (RTS)
  - Communications Manager (HUB4 or HUB10)
  - FLEXnet DC Monitor
  - Surge Protector

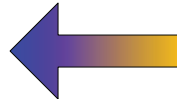
- Customer Supplied Components:
- AC Source:
    - Utility Grid AC or
    - AC Generator with circuit breaker or overcurrent device
  - Main AC Distribution Panel
  - AC Distribution Sub-Panel (Load Panel)
  - Battery Bank (24 or 48 Vdc)
  - Photovoltaic (PV) Array



On-Grid Overview



## Utility Grid



AC OUT 1  
(Selling)

OPTIONAL: An AC Generator with a circuit breaker or overcurrent device can be used in this application for backup purposes. However, a specific kind of generator is required. See the inverter literature for additional details.

<sup>1</sup> Excess RE not being used by the AC Loads. The loads get priority over selling back to the grid.



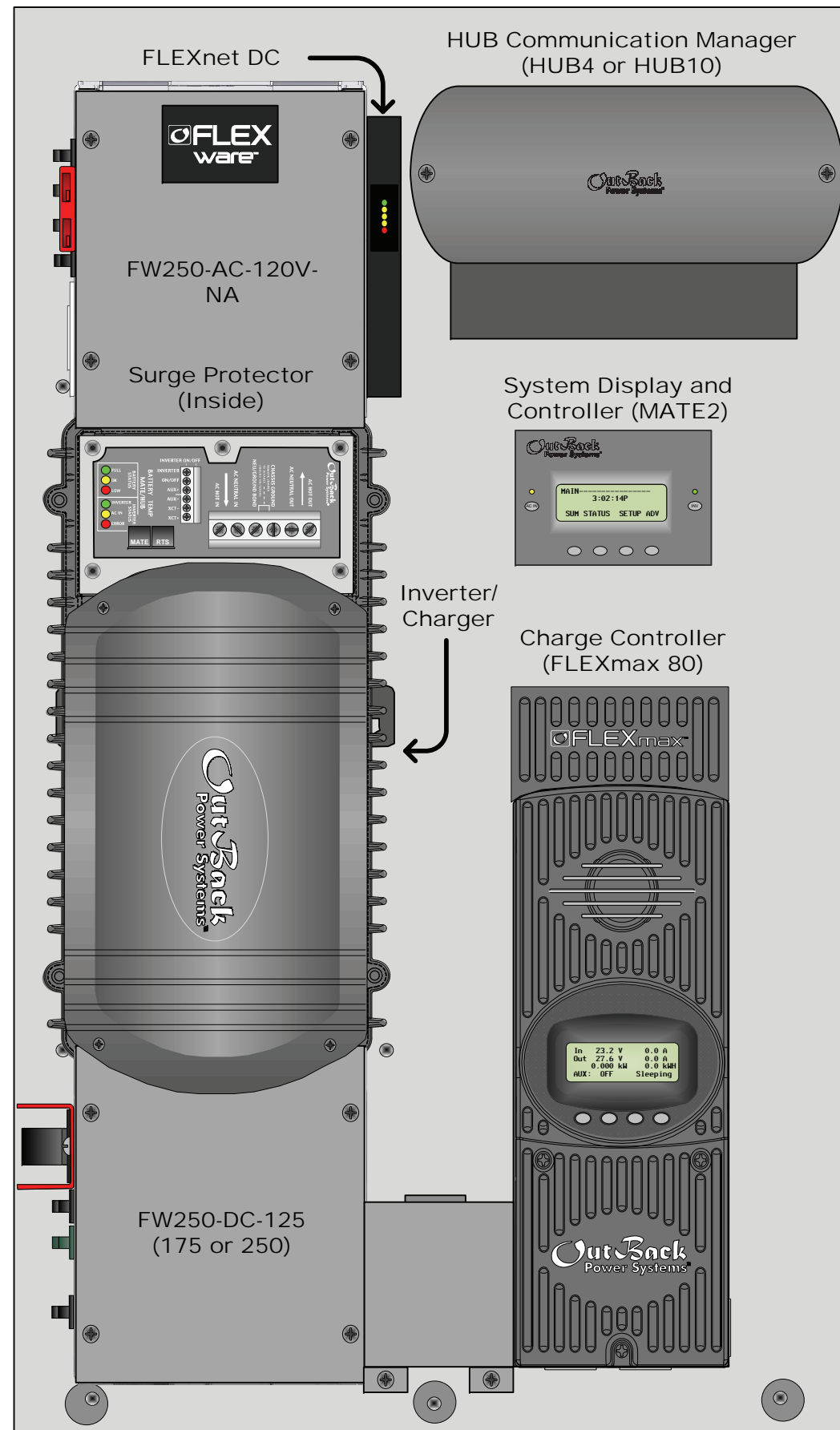
## Loads

AC OUT2



<sup>2</sup> from utility grid by default. IF RE is available, it gets 1<sup>st</sup> priority here. The remainder is sold. (See note 1 above).

**IMPORTANT: Example only.** Actual configuration will vary depending on the specific installation requirements.

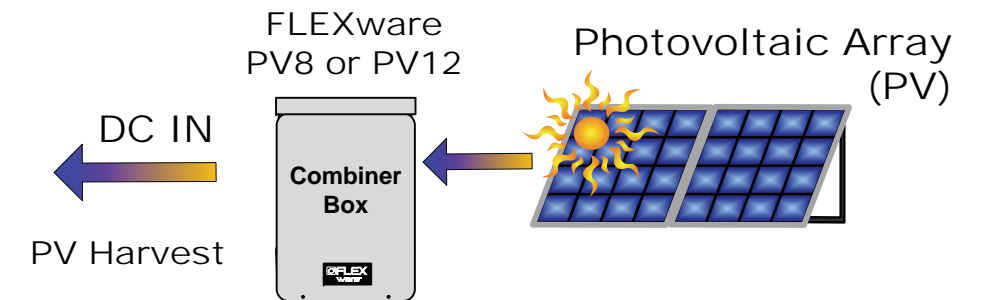


## Major Components

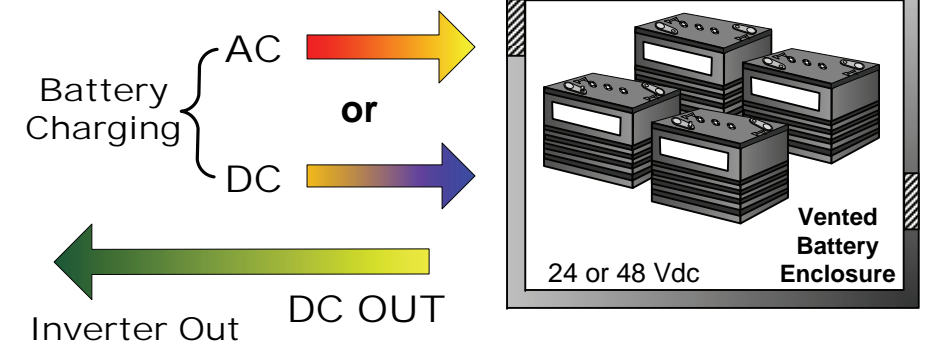
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  - Charge Controller (FLEXmax 80 or FLEXmax 60)
  - Remote Temperature Sensor (RTS)
  - Communications Manager (HUB4 or HUB10)
  - FLEXnet DC Monitor
  - Surge Protector

- Customer Supplied Components:
- AC Source:
    - ~ Utility Grid AC
  - Main AC Distribution Panel
  - AC Distribution Sub-Panel (Load Panel)
  - Battery Bank (24 or 48 Vdc)
  - Photovoltaic (PV) Array

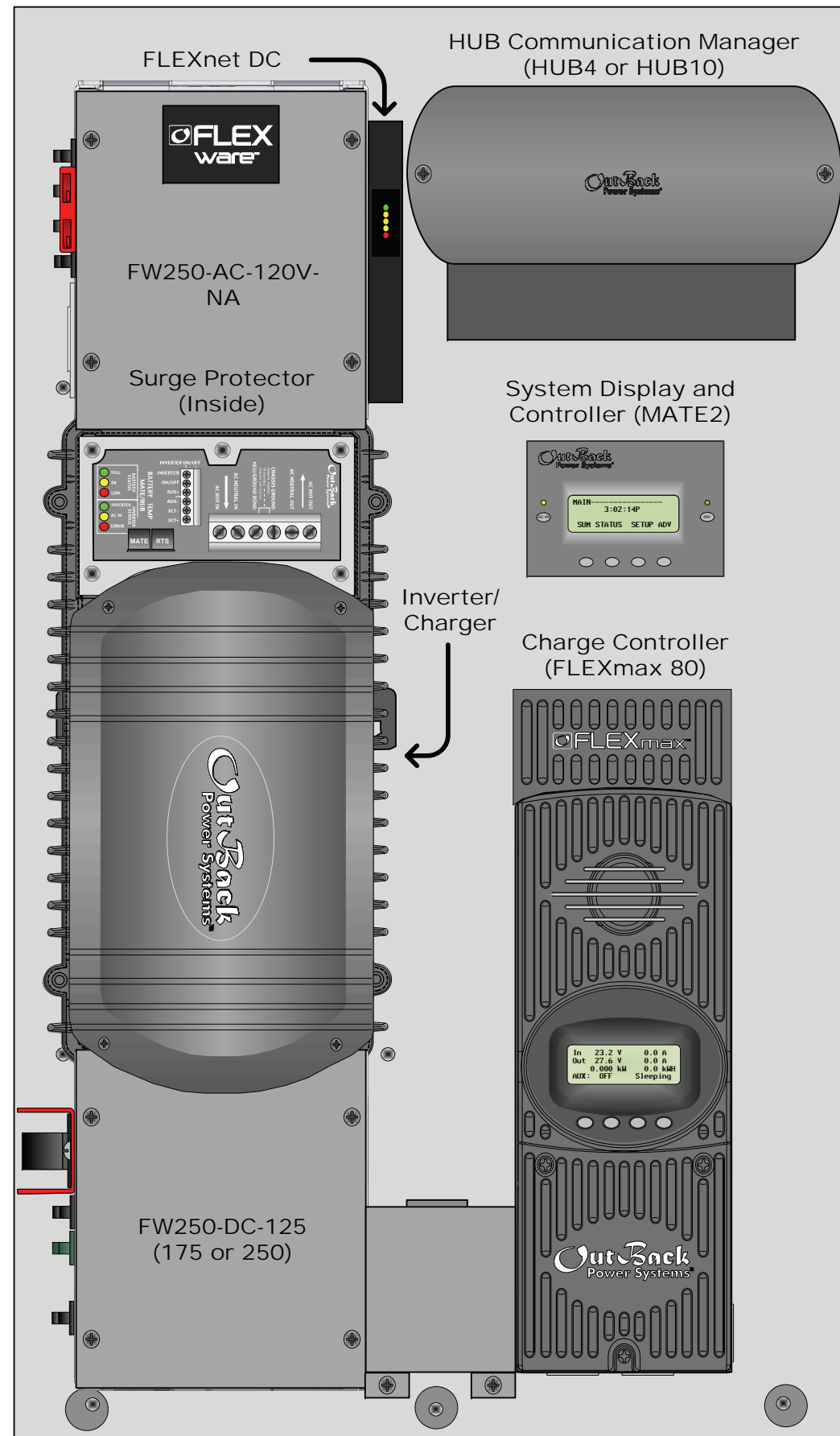
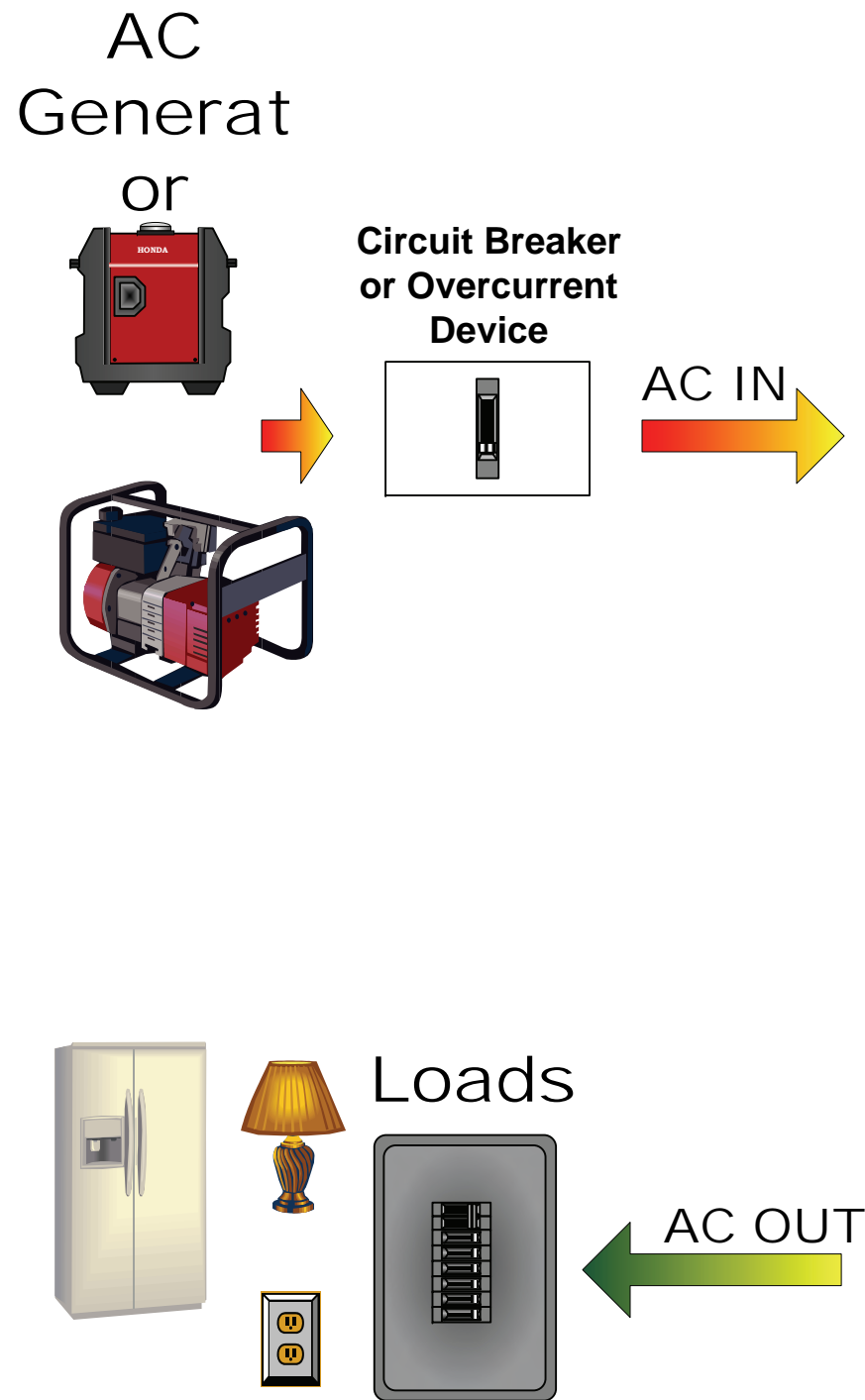
## Renewable Energy (RE)



## Battery Bank



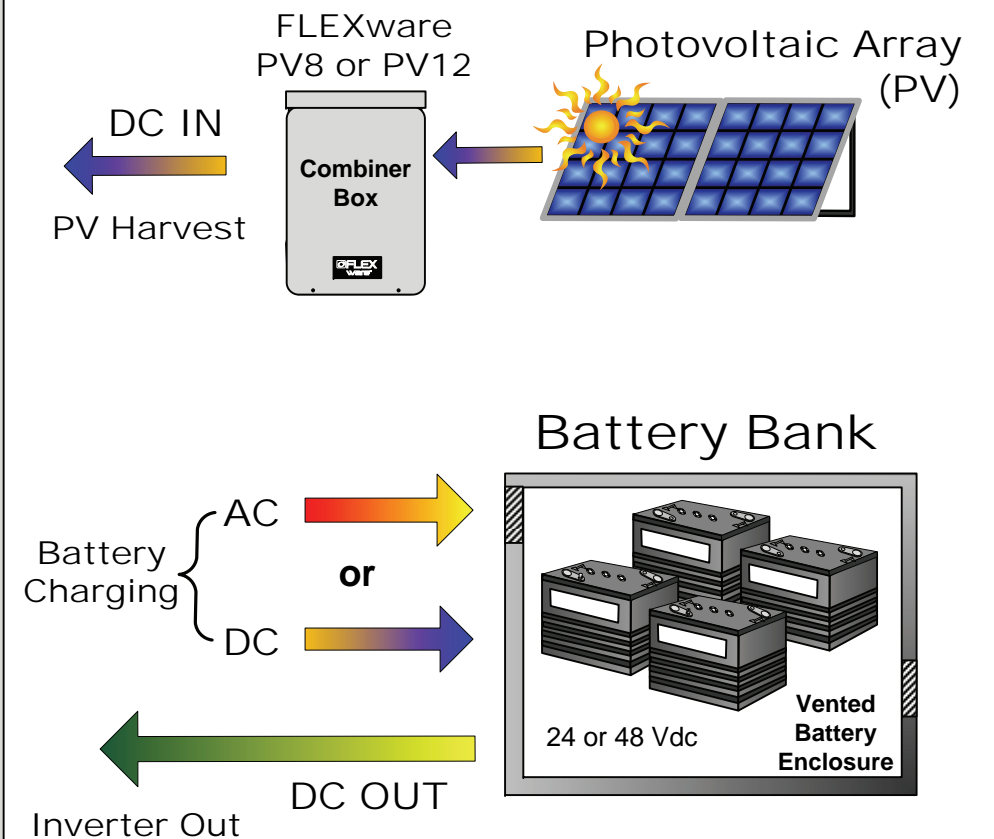
Grid-Tie Overview



## Major Components

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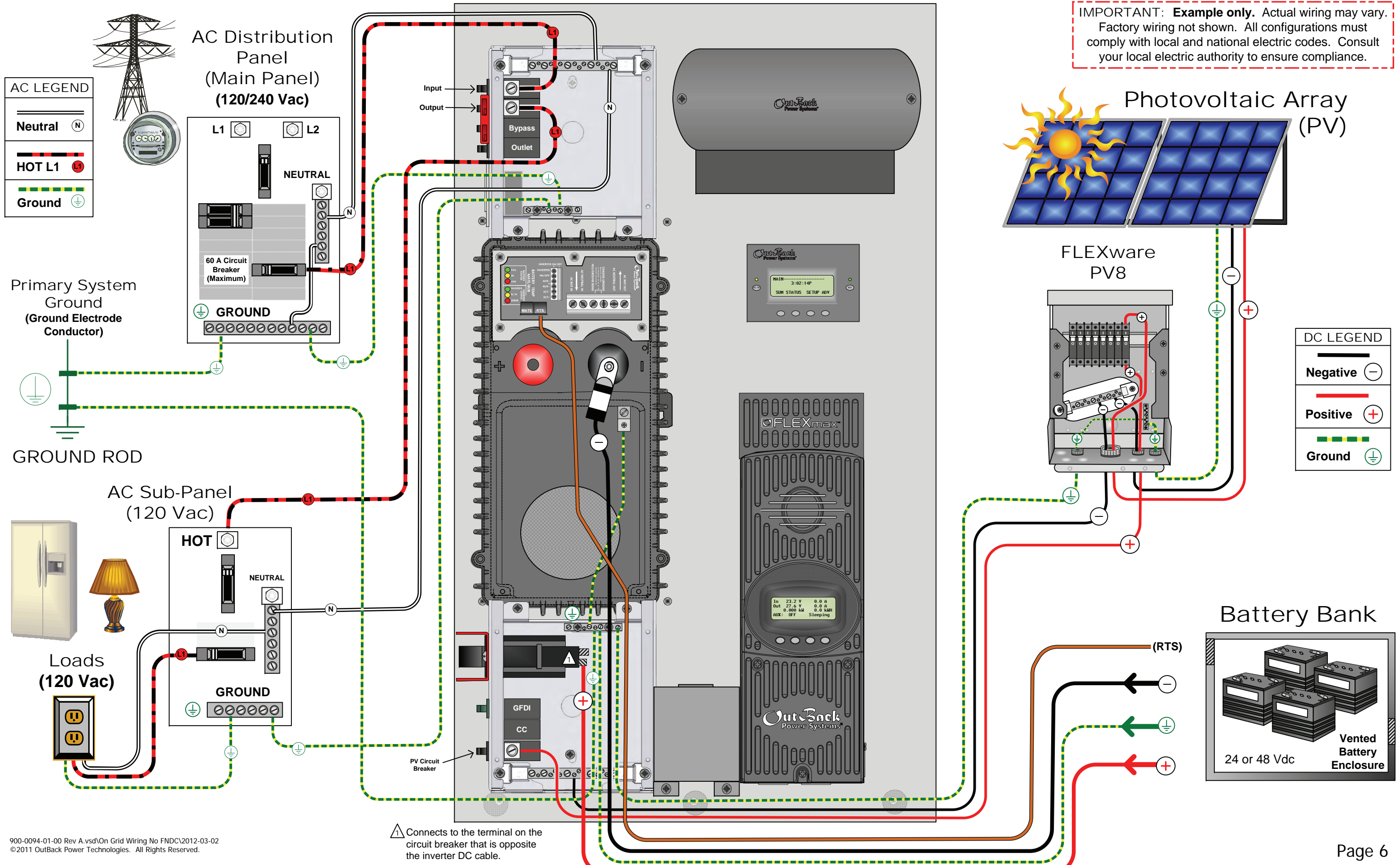
## Renewable Energy (RE)



**IMPORTANT: Example only.** Actual configuration will vary depending on the specific installation requirements.



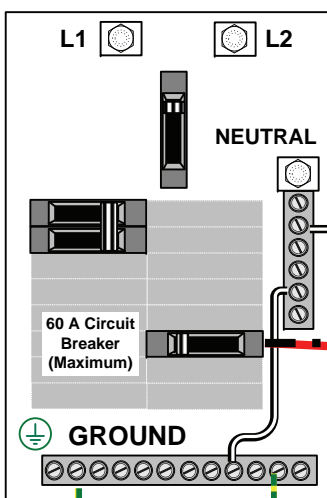




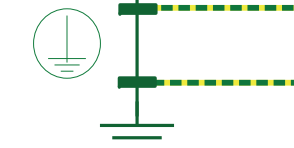
**AC LEGEND**

— (with N symbol)	Neutral
— (with L1 symbol)	HOT L1
— (with ground symbol)	Ground

AC Distribution Panel  
(Main Panel)  
(120/240 Vac)

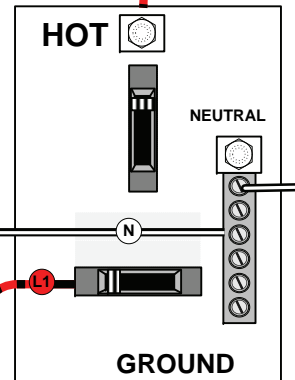


Primary System Ground  
(Ground Electrode Conductor)



GROUND ROD

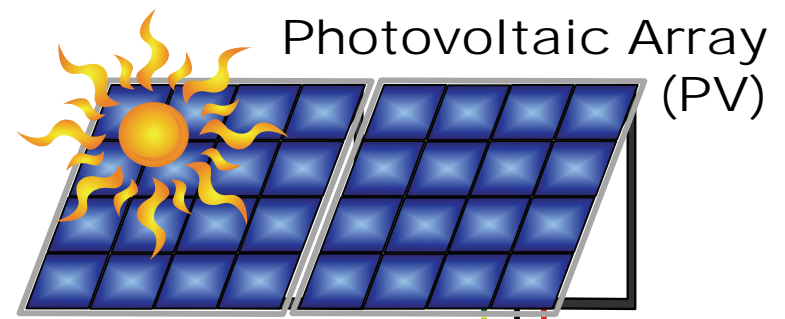
AC Sub-Panel  
(120 Vac)



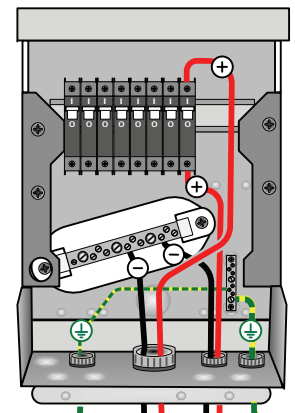
Loads  
(120 Vac)



**IMPORTANT: Example only.** Actual wiring may vary. Factory wiring not shown. All configurations must comply with local and national electric codes. Consult your local electric authority to ensure compliance.



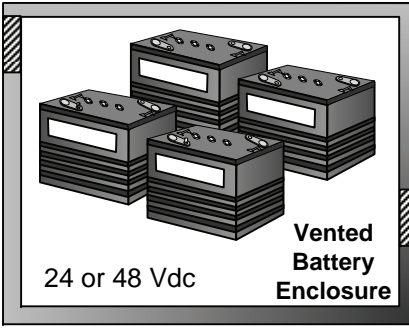
FLEXware  
PV8



**DC LEGEND**

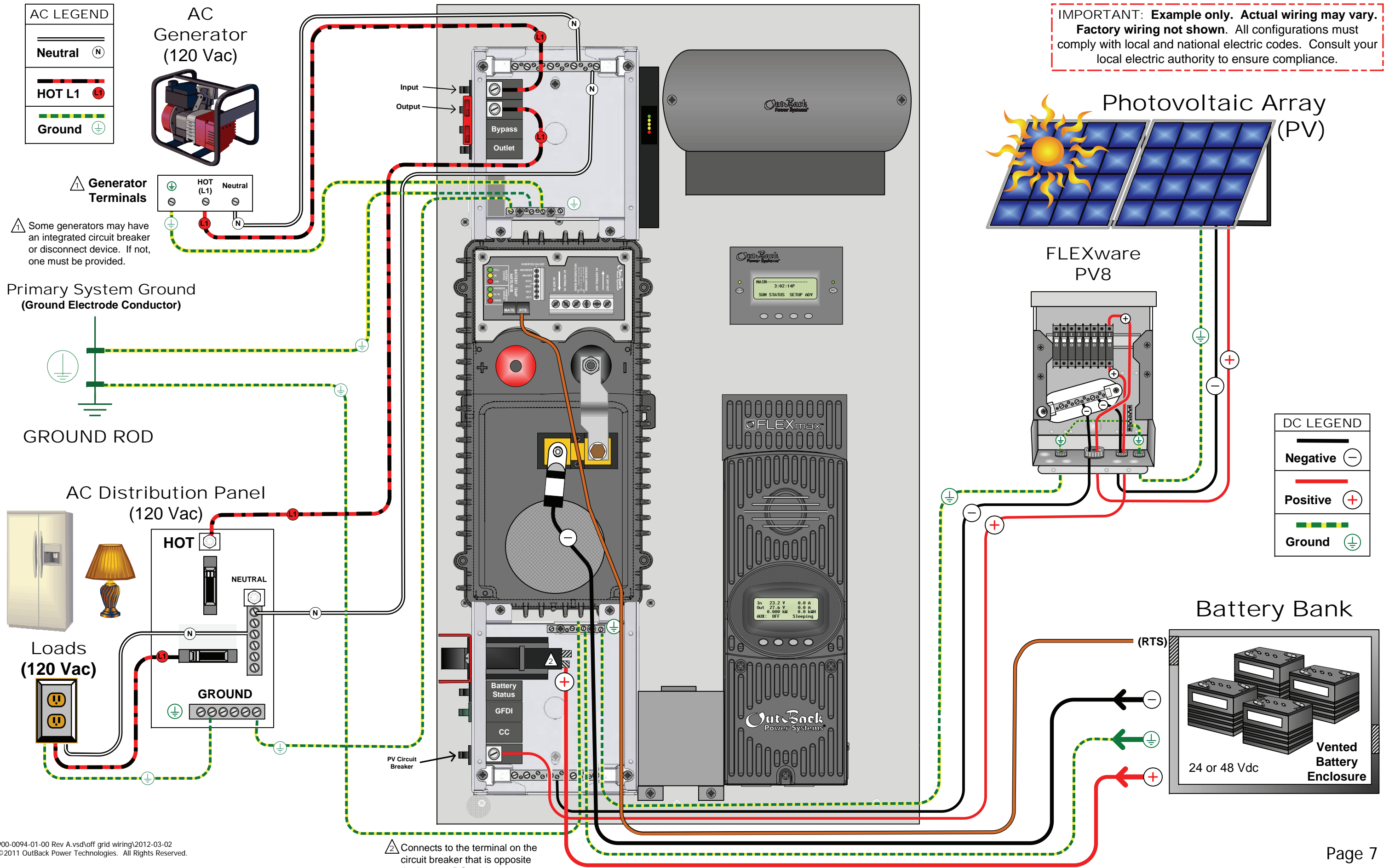
— (with - symbol)	Negative
— (with + symbol)	Positive
— (with ground symbol)	Ground

Battery Bank

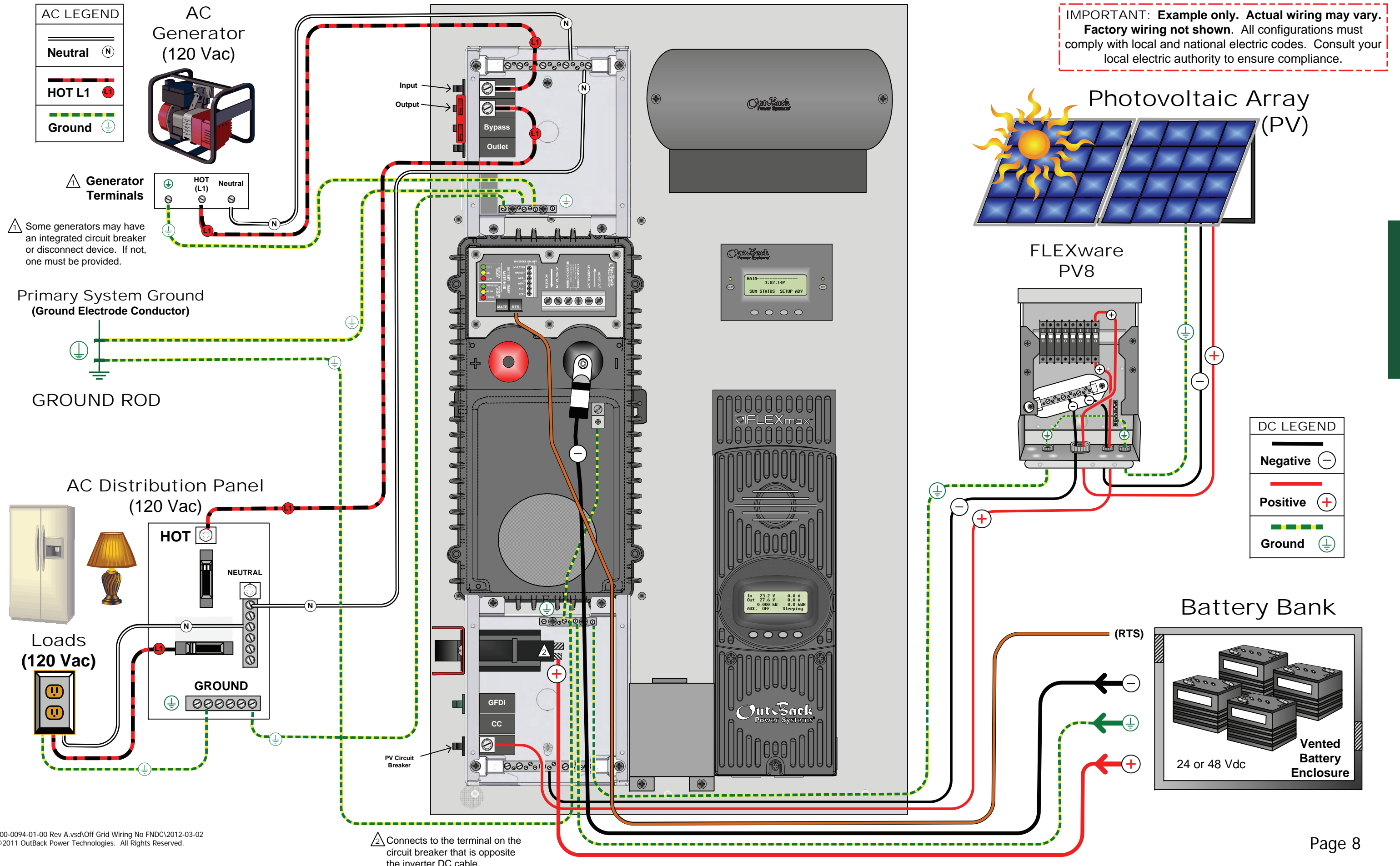


⚠ Connects to the terminal on the circuit breaker that is opposite the inverter DC cable.





# Wiring Overview – Off-Grid Applications



Off-Grid Wiring

# About OutBack Power Technologies

OutBack Power Technologies is a leader in advanced energy conversion technology. Our 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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## Warranty Summary

OutBack Power Technologies warrants that the products it manufactures will be free from defects in materials and workmanship for a period of five (5) years subject to the conditions set forth in the warranty detail, found in the product manual.

OutBack Power Technologies cannot be responsible for system failure, damages, or injury resulting from improper installation of their products.

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## Date and Revision

January 2012, Revision A

## Part Number

900-0094-01-00 Rev A



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