

## OutBack Chargers with the Fortress eVault Battery

The following pages detail specific settings and methods used when integrating a Fortress eVault battery with OutBack equipment in an open loop configuration.

### Integrating with a Radian/FXR

The following charge settings are recommended when pairing a Fortress eVault battery with a single Radian or FXR system. Please consult the *MATE3s Programming Guide* for detailed instructions on how to adjust the settings.

Radian	Setting
<b>Absorb Voltage and Time</b>	54.4 Vdc / 0.3 hr <sup>1</sup>
<b>Float Voltage and Time</b>	54.4 Vdc / 0.0 hr
<b>Re-float Voltage</b>	52.5 Vdc
<b>Re-bulk Voltage</b>	51.5 Vdc
<b>AC Charger Limit (A<sub>AC</sub>)</b>	30 Aac
<b>Low Battery Cutout</b>	50.8 Vdc
<b>LBCO Delay</b>	120 seconds
<b>Low Battery Cut-in</b>	51.2 Vdc
<b>High Battery Cutout</b>	56.0 Vdc
<b>HBCO Delay</b>	10 seconds
<b>High Battery Cut-in</b>	55.5 Vdc
<b>Sell Voltage</b>	53.2 Vdc
<b>Charge Controller</b>	
<b>Absorb Voltage</b>	54.8 Vdc / 0.3 hr
<b>Float Voltage</b>	54.0 Vdc
<b>Re-bulk Voltage</b>	51.5 Vdc
<b>DC Current Limit</b>	60/80/100 Adc <sup>2,3</sup>
<b>Absorb End Amps</b>	0 Adc
<b>FN-DC</b>	
<b>Battery Ah</b>	360 Ah
<b>Charged Voltage</b>	54.0 Vdc
<b>Charged Return Amps</b>	10 Adc
<b>Battery Charge Efficiency</b>	96%
<b>MATE3s</b>	
<b>FN-DC Advanced</b>	Low SOC Warning = 15%
<b>FN-DC Advanced</b>	Critical SOC Warning = 10%

<sup>1</sup> Time has been increased from the recommended value in the Fortress manual based on analysis of the unit's reported SOC, the inverter reported SOC, and the amount of charge acceptance.

<sup>2</sup> Max current limit based on charge controller model.

<sup>3</sup> Ensure the maximum battery charging current is not exceeded after all charge controllers are taken into consideration (i.e. – 2 FM100s would charge at 200A total).

## Best Practice Operation

When using the Fortress eVault battery in a grid-tied system, the **Sell Voltage** setting must be raised above the default value of 52.0 Vdc to prevent the unit from 'selling the battery'. The recommended **Sell Voltage** setting is 53.2 Vdc. After a full charge, the Fortress battery rests at approximately 53.4 Vdc. If **Sell Voltage** is 52.0 Vdc, the Radian will see this 1.5 Vdc as an indicator of excess PV production and sell as much as it can until the batteries reach 52.0 Vdc. Because lithium batteries have a flat voltage profile, this additional 1.5 Vdc is a significant amount of energy.



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**CAUTION: Hazard to Equipment**

Temperature compensation should never be used with lithium batteries.

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## Integrating with a SkyBox

The settings below should be programmed under the **Custom** choice. Please consult the *SkyBox Programming Guide* for detailed instructions on how to adjust these settings.

SkyBox	Setting
Maximum SOC	100%
Minimum SOC	20%
Absorb Charge	Timed
Absorb Voltage	54.4 Vdc
Absorb Time	00:20
Float Charge	Disabled
Float Voltage	Can be left at default
Float Time	Can be left at default
Re-float Voltage	52.5 Vdc
Re-bulk Voltage	51.5 Vdc
Equalize Voltage	54.4 Vdc
Minimum Equalize Time	00:00
Max Charge Current (Adc)	100 Adc (Default)
Max Discharge Current (Adc)	125 Adc (Default)
Grid Charge Limit (kW)	Site specific
Low Battery Cutout (LBCO)	50.2 Vdc <sup>4</sup>
LBCO Delay	15 seconds
Low Battery Cut-in	51.0 Vdc
High Battery Cutout	56.0 Vdc
HBCO Delay	10 seconds
High Battery Cut-in	55.5 Vdc
Battery Series	Custom
Battery Model Number	Custom
Battery Description	Fortress eVault
Battery Total Amp-Hours	360 Ah
Charge Efficiency Factor	96%
Absorb End Amps	10 Adc

### Best Practice Operation

Upon installation, a total commissioning charge is required to properly calibrate the SkyBox state-of-charge (SOC) monitor. This should be done using the 'Reset SOC' button. Initiating this type of charge will begin a full charge cycle and the SOC to 100% at the conclusion of the charge. If possible, a full load test down to LBCO should also be performed. Each time the battery reaches the low battery cutout voltage, the SkyBox recalculates a state-of-health (SOH) for the battery. This number is used to more accurately track the SOC.



#### **CAUTION: Hazard to Equipment**

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<sup>4</sup> Lower than the Radian setting based on amount of delay time required.

## About OutBack Power

OutBack Power is a leader in advanced energy conversion technology. OutBack 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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## Other

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