



**VANLIFE**  
OUTFITTERS

## Using a Sterling BB1248120 DC-DC Charger for 12-Volt Vehicle Battery to 48V House Battery Charging in a Camper Van

### 1. Fuse at vehicle battery to Sterling DC-DC (12V)

According to the [manual](#) the maximum input current draw is 125 amps at 12-volts. The general guidance for DC-DC charging is to limit the current to less than 50% of your stock alternator rating. In your case, that is likely around 90-100 amps. There is the ability to throttle the input current to 85% or 65% of the maximum of 120 amps. See the screenshot from the manual below. That would be around 102 amps with a 85% throttle or around 81 amps with a 65% throttle.

#### Settings

- Battery type - here you can change battery type, you can also select user defined setting (custom) - the custom profile is adjusted in the User Defined 1 and 2 settings below.
- EQ Mode - Enabling EQ mode shall put the BB into a desulphation cycle. Warning high voltage.
- Float on/off - Here you can turn off float mode - only available in lithium
- Ign - Ignition mode, you can toggle whether the BB is in ignition mode or not. (on/off)
- Backlight - Here you can adjust how long the backlight stays on after you press a button (All, 10s-250seconds).
- **Set Current** - here you can adjust the current levels to 65%, 85% or 100%.
- User defined setting 1 - here you can adjust absorption voltage, float voltage and absorption time lengths
- User defined setting 2 - here you can adjust absorption voltage, float voltage and absorption time lengths
- **SAVE AND EXIT** - This is **CRITICAL** if you want to save the settings you have changed, they will otherwise be forgotten.

I'll also paste in the recommended wire and fuse sizes from the manual which are based on the maximums.

<b>BB1248120</b>	
Input voltage range	9V-16V
Max Rated output power	28A at 57.6V
Max Rated input current	120A
Quiescent current	5mA
Efficiency rating	92-94%
Dimensions	270mm x 130mm x 73mm
Weight	1.8Kg
Terminal diameter	8.9mm
Recommended Input cable	35mm <sup>2</sup> or above (2awg)
Recommended Input fuse	150A
Recommended Output cable	6mm <sup>2</sup> or above (10awg)
Recommended Output fuse	40A

If you go with the 85% throttle you could use a 125 amp mega fuse (up to 32V rating) at your van's vehicle battery connection.

<https://www.vanlifeoutfitters.com/store/victron-energy-mega-fuses/>

Then you would size the wire for the circuit accordingly. The manual recommends 2 AWG. If we use the [Blue Sea Circuit Wizard](#) to double check that recommendation with 125 amps as the max current (because of the fuse size) and a round-trip wire length of 30 feet with an allowable 10% voltage drop, it suggest 4 AWG or 2 AWG. So, I would recommend the 2 AWG for this part of the circuit.



## 2. Fuse at Lynx Distributor for output from Sterling DC-DC (48V)


The Sterling manual calls for a 40 amp fuse here but it's actually quite hard to find "small" 45V capable mega fuses. The one we have is a 60 amp rating:

<https://www.vanlifeoutfitters.com/store/littelfuse-60-amp-mega-fuse-48-volt/>


As you see above, we normally recommend the [Blue Sea Circuit Wizard](#) for determining the right gauge of wire to use but it does not work with 48V systems. This [ABYC version does](#).

If you use the ABYC calculator to size the wire for this "output" circuit at 60 amps and a 3% allowable voltage drop, it suggests 10 AWG which is a handy size of wire that you can use in a few other places as well in your system. Here's a screenshot of that.


ABYC Wire Size Calculator




Wire Size Mode



Ampacity Mode

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Cable Run (both ways) 6 feet ▼

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Electrical Load 60 Amps ▼

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System Voltage 48 V ▼

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Max. Voltage Drop 3% ▼

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Conductor/Insulation Temperature Rating 105 °C (221 °F) ▼

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Current-Carrying Conductors in the Bundle 1 ▼

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Installation in Engine Compartment?

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Cable used for AC?

The minimum required cross-sectional area of the conductor is 10383 circular mils (5.26 mm<sup>2</sup>). This is determined by ampacity requirements which exceed those of voltage drop. This corresponds to

10 AWG

3. **Fuse at Lynx Distributor to MultiPlus (48V)**

Recommended from the MultiPlus manual. 125 amps at up to 58V.

<https://www.vanlifeoutfitters.com/store/victron-energy-125-amp-mega-fuse-48-volt/>

4. **Fuse at Lynx Distributor to Orion 48/12/30 converter (48V)**

Here again, I would go with the 60 amp mega fuse.

<https://www.vanlifeoutfitters.com/store/littelfuse-60-amp-mega-fuse-48-volt/>

Even though it's much larger in current capacity that is needed for this circuit, your circuit protection/fuses is to protect the wire and you can use the same, 10 AWG wire for this circuit that you would in #2 above.

5. **Fuse between battery and Lynx Distributor (probably a terminal/MRBF) (48V)**

I would use a 200 amp terminal/MRBF fuse for this. They are rated for up to 58V as well.

<https://www.vanlifeoutfitters.com/store/blue-sea-200-amp-terminal-fuse-5187/>

Normally we recommend 1/0 AWG wire between the batteries and the main bus bars (Lynx Distributor) in these 48V systems but you can use the ABYC wire size calculator here as well.

6. **For your 120VAC loads/circuits (output from the MultiPlus) and your 12VDC loads**

**(output from the Orion 48/12/30 converter** you might want to check out our [combo load center from WFCO](#). It uses standard automotive 12V fuses for the DC loads and HOM style breakers for the AC side. We have some recommendations for the HOM breakers in this "[stuff we don't sell yet](#)" sheet. We explain "why" you want to use a 50 amp main breaker instead of the 30 amp you'd expect in [this blog post](#).