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Decapentaplegia



Circuit breaker for 1000W inverter?

Hi folks, I'm looking at connecting a power inverter to my 12V to use as a generator while camping.

I see most people use a fuse/breaker when installing an inverter - is this required, and if so what kind will work? I'm planning on leaving the car in ready mode while I use it, and not exceeding 1000W draw. The inverter I'm looking at is a DeWalt modified sine wave with 2000W peak / 1000W continuous power.



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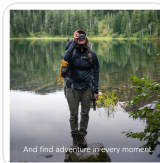
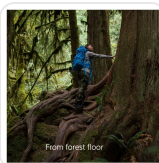
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Your inverter may have a fuse, but if there's a short somewhere in the wiring, you could damage your 12V battery or electrical system, or start a fire. If you're doing a "permanent" installation, I would use a fuse. If it's just alligator clips that you remove when not in use, you're probably fine.

Now, 1000W is a lot of power. And if that's 1kW on the AC output, you'll be drawing significantly more on the DC side. There's also a fun effect with inverters. When the inverter draws current, the input voltage will drop, requiring the inverter to draw even more current to maintain output power..

1kW is really pushing what your car/battery can handle. I've done it before for a few minutes at a time but it was just way too much imo, so I stopped using it that way. Make sure you have short wires and the biggest gauge you can handle. Be careful, and be kind to your Prius!



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use it because some inverters will still drain electricity even though it is off. The cut off switch ensures that it is off.

If you are connecting electronics, go with a pure sine wave inverter. Modified runs a number on electronics. Also make sure you have the appropriate gauge power wire and use connector o-rings to terminal instead of the battery clamps.

Edit. A Fuse is needed to protect the power wire from burning (should be installed as close to the battery as possible. So that's up to you if you want to install a fuse or not. The fuse on the inverter protects the inverter.

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myself248 • 2y ago

The fuse protects the wire, and should be installed upstream of it. Size the wire and the fuse together.

Personally I wouldn't ask the Prius system to do more than about 100A continuous, despite the inverter being capable of more. The issue is that the white wire, which carries the 12v feed from the front to the back, is pretty small and it's only fused at 125A, and it's not a slow-blow fuse, so you want to make sure you *never* exceed that even for a moment. Blow that fuse and you're dead in the water.

And the issue is that all the high-amp breakers you can buy are slow-trip thermal types, so for instance, a 100A thermal breaker will allow 200A for like 10 seconds before it trips. But, if your battery is healthy, then drawing 200A with the inverter doesn't immediately translate to 200A over the white wire, probably closer to half that for a few moments until the battery comes off its surface-charge. So that's probably a good spot to aim for, a 100A breaker.

Which means you need wire that can safely carry 100A continuously. (This implies that it can carry more current for shorter times; thermal breakers model the thermal behavior of wire.) I like to use the ABYC E-11 guidance for this, which says that if we make some safe assumptions about insulation temperature, you'd be just skirting it with 6AWG, in the clear with 4AWG, and 2AWG would be gratuitous overkill with nice low loss if you're putting the inverter more than a few feet from the battery.

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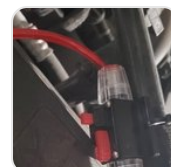
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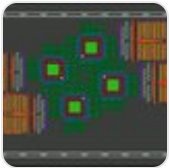


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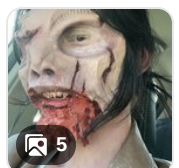
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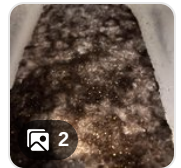
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