



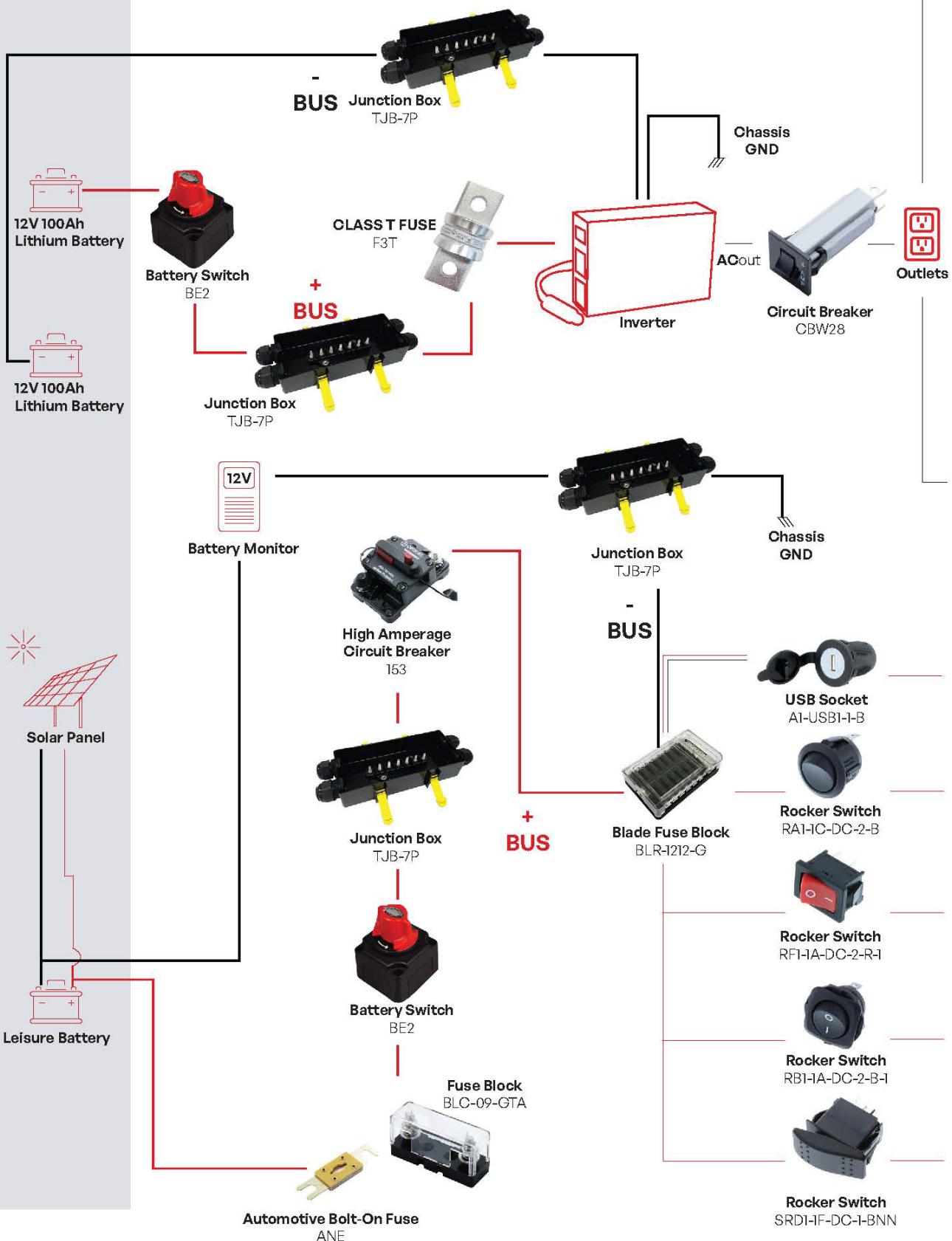
# RV Fuses Explained: How to Protect Your Camper's 12VDC Electrical System



## Why Fuses Matter in RVs

A fuse is your last line of defense against burnt wiring, damaged gear, and fires. In RVs, where 12 VDC and 120 V AC often live side-by-side, matching the right fuse type and location keeps faults from turning into costly disasters. In some locations, resettable high-amp circuit breakers are used instead of fuses, but they follow the same basic rules: protect the wire, clear faults quickly, and keep energy contained. RVs pack a lot of electrical gear into a small, mobile space: batteries, inverters, solar, slide motors, fans, pumps, and all the creature comforts of a tiny home on wheels. Long, unoptimized wire runs, vibration, and DIY add-ons all increase the chances of a short-circuit or overload.

## DC Power



## AC Loads



## DC Loads



# RV Electrical at a Glance

## 12 V DC side (house system)

- Battery banks (lead-acid, AGM, lithium)
- Interior and exterior lights
- Water pump and fans
- Refrigerator electronics and control boards
- Solar charge controllers and DC-DC chargers
- Inverter DC inputs and other add-on accessories

## 120 V AC side (shore/generator side, typically breaker-protected)

- Shore power inlet
- Generator output
- Inverter AC output
- Receptacles/outlets
- Microwaves, televisions, and other AC appliances

In this article we'll focus on 12V DC fusing, the parts that protect your batteries and 12V distribution.

## Common RV Fuse Types (What to use, and where)

### ■ Blade fuses (1A-80A)



Blade fuses are the most common fuse found in RVs. They're popular because they're compact, inexpensive, and easy to diagnose at a glance. If the link is melted, you see it within seconds.

- Use blade fuses for low to mid-current RV circuits: lights, fans, USB/aux ports, control circuits, and small pumps.
- Pair them with covered blade fuse blocks so labels stay tidy and roadside diagnostics are quick.
- OptiFuse has all sizes available:
  - MICRO 3 Style | MICRO2 Style
  - Mini Style | Mini Style – Low Profile
  - Regular (ATO/ATC Style)
  - Maxi Style

## ■ Bolt-On Fuses for High-Current RV Circuits

Fuse Type	Typical Range (A)	Typical Use in RVs	Notes
MIDI (MID, MIDA)	~30-200 A	Small/mid inverters, DC-DC chargers, sub-panels	Compact, good for medium feeders close to the source
MEGA (MGGA, MGGA-B)	~100-300 A	Larger inverters, big DC-DC chargers, alternator feeds	Widely used in van/RV upfits, broad rating range
ANL-Style (ANE, ANE-M, ANF)	~35-400A	Main battery feeds, alternator charge lines, inverter inputs	Clear window that allows for easy open fuse identification



MIDA

MGGA-B

ANE

### MIDI Fuses

- Use MIDI-style fuses for medium-current feeders, like small/mid inverters, DC-DC chargers, and distribution sub-panels.
- OptiFuse MID/MIDA fuses are compact, vibration-resistant, and mount close to the source to minimize unprotected cable.
- Pair with MIDI fuse holders / covered blocks for safer, serviceable installs.

### MEGA Fuses

- Use MEGA-style fuses for ~100–300 A higher-draw devices: larger DC-DC chargers, mid/large inverters, and high-output alternator feeds.
- They're popular in RV and van upfits due to their broad current range and rugged terminations.
- OptiFuse's MGGA and MGGA-B cover common MEGA-style ratings.

### ANL-Style Fuses

- Use ANL-style fuses for ~35–400 A main battery feeds, alternator charge lines, and inverter inputs.
- OptiFuse's ANE and ANF provide ANL-style performance with compatible blocks and limiter options.

## ■ UL Listed, Class T Fuses



F3T 225A-400A

F3T 110A-200A

F3T 70A-100A

BLT3-400

Class T fuses range from 1 to 1200 A at 300 VAC / 160 VDC and are very fast-acting with a high interrupt rating, making them ideal for applications where battery banks and inverters can deliver huge fault currents. With silver-plated blades for corrosion resistance and fast short-circuit response, OptiFuse's Class T Fuses are excellent candidates for inverter and battery protection in demanding RV systems. See F3T Class T fuses for more detail.

To mount these fuses in an RV, OptiFuse offers Class T fuse blocks designed around real-world marine/rv installs:

- **BLT3-200** mounts 110A-200A fuses
- **BLT3-400** mounts 225A-400A fuses

When paired with an F3T fuse, both blocks are ignition-protected and include an insulating cover that meets ABYC requirements. Each features a four-stud layout, making it easy to connect batteries, inverters, and bus bars without fighting for space.

## ■ **High-Amp Circuit Breakers (When a Resettable Device Makes Sense)**



143



153



151

In the same current ranges as MIDI/MEGA/ANL fuses, many RV builders use high-amp circuit breakers for certain loads:

- Typical range: roughly 25-300A, depending on breaker style
- Common RV uses slide-out motors, leveling jacks, tongue jacks, winches

### **Why choose a breaker instead of a fuse?**

- Automatic reset, modified reset, manual reset capabilities available
- Can double as a local disconnect in a pinch
- Easy to troubleshoot in the field

### **Key things to watch**

- **DC voltage rating:** Make sure the breaker's DC rating meets or exceeds your system voltage (12/24/48VDC), not just the AC rating on the label.
- **Interrupt rating (AIC):** Just like fuses, high-amp breakers must be able to safely interrupt worst-case fault current that can be seen by the breaker.
- **Continuous rating:** Many thermal breakers can run warm at their respective rating. Treat their "30 A" or "100 A" rating like a continuous rating and size wiring and loads accordingly.
- **Environment and mounting:** Stud-type and panel-mount breakers need secure mounting and strain-relieved cables; vibration and heat can impact long-term performance.

This article focuses on fuses first, since they set the baseline for overcurrent protection. In many well-designed RV systems, you'll see a mix of bolt-on fuses for main battery / inverter feeds and high-amp breakers where reset capability and visual status are helpful.

# How to Size an RV Fuse

- 1. Start with the wire.** Choose a fuse rating at or below the wire's ampacity. The fuse's primary job is to protect the conductor, then the equipment. Verify the fuse has a DC voltage rating that meets or exceeds system voltage and a sufficient interrupt rating for worst-case fault current.
- 2. Account for continuous load.** For loads running 3+ hours (fans, fridges), target ~125% of continuous current so nuisance openings are minimized.
- 3. Check voltage & interrupting rating (AIC).** DC arcs are stubborn, especially with big lithium banks or large inverters.
- 4. Choose form factor & holder type.** Match the environment: vibration (bolt-on), serviceability  
Match the mechanical environment:
  - o High vibration, high current: bolt on fuses and stud-type breakers or blocks
  - o Serviceable low currents: blade fuses in organized fuse blocks

## Placement That Actually Protects

**Fuse every positive conductor leaving the battery bank** Main feed, inverter feed, DC-DC charger feed, solar/controller feed, each should have its own fuse or breaker mounted as close to the battery as practical.

**Keep unprotected lengths short** Aim to minimize the length of the cable between the battery and the first overcurrent device. Where you can't, add abrasion protection, loom, or conduit in tight runs under floors, through walls, or near metal edges.

**Fuse sub-panels and branch circuits appropriately** Main DC fuse -> sub panel -> properly sized branch fuses for each load. This keeps fault energy localized and simplifies troubleshooting.

## Selecting the Appropriate Fuse Holder



LPR-02



BLR-I-1212-G

Once you've chosen a fuse, match it with a holder suited to the location, environment, and service needs:

- In-line fuse holders:**
  - o Small form-factor, great for single-circuit branch protection near the load or source
  - o Ideal for add-on accessories, 24-hour "always-hot" circuits, and simple retrofits
  - o See OptiFuse's LPR-02, LPM-08, LPX-02
- Fuse blocks/panel-mount**
  - o Allow for centralized distribution, easier labeling and troubleshooting
  - o Options for clear insulating covers, LED blown-fuse indication, split buses, and ground buses
  - o See our BLR-I-504, BLC-106-G, BLR-I-1212-G