PowerFilm SOLAR
ASSEMBLED IN THE USA

School Bus Solar Panel Installation Instructions

The panel pictured is a 110W model, but these instructions apply to both the 50W and 110W models.

Required Materials

Cleaning Supplies:

- >90% Isopropyl Alcohol
- Lint-free shop rags or clean cloths

Measurement & Marking Tools:

- Tape measure
- Permanent marker

Unpacking Tools:

- Scissors, utility knife, or hook tool (for cutting stretch wrap carefully)

Installation Tools:

- Screwdriver set
- Wire cutters
- Heat gun
- Socket wrench
- Multimeter (for power testing)
- Alcohol wipes
- Plastic felt-edged squeegee

Electrical & Fastening Components:

- Roof-mounted solar panel
- Long solar cable with a connector
- Butt shrink connectors
- Heat shrink wrapper
- Small ring terminal connector
- P-Clips
- White flex seal tape

- Self-tapping screws (x2)
- Zip ties

Roof Preparation and Panel Placement

1. Clean the installation location with >90% isopropyl alcohol and a clean towel or rag.
2. Once you are on the mounting surface (not before), unpack the panel by cutting the banding and carefully removing the cardboard packaging.
3. Position the solar panel close to the front and center (height-wise) of the roof.
4. If the bus has a small black antenna on the roof, align the panel so that the cable and the white control box sit directly behind the antenna for protection. Mark the desired install location with a permanent marker to ensure alignment during the installation process.

Double-Release Liner Installation Method


1. **CRITICAL STEP:** Begin by slowly pulling the release liner, exposing 1–2 inches of the butyl adhesive.
2. Align the panel precisely in the desired location—once the butyl adhesive is pressed down, the position is permanent.
3. Using a plastic felt-edged squeegee, press the exposed butyl portion firmly to the roof.
4. Stroke from the center outward in diagonal motions to avoid air pockets.
5. Continue pulling the double-release liner gradually, while squeegeeing the panel in the same center-out pattern. Pull about 12 inches of release at a time, exposing about 6” of adhesive.
6. **Warning: DO NOT** attempt to pull the panel up once it is set; this will cause damage.
7. After the entire panel is seated, carefully work out any remaining air pockets with the squeegee.

Cable Routing Through Driver-Side Mirror Grommet

1. Remove the bolts from the driver-side mirror to expose the wiring hole used for the heated and controlled mirror.
2. Cut the long solar cable approximately 16 inches above the white control box so that it fits through the mirror grommet.
3. Attach the long solar cable to the panel's cable connector.
4. Feed the cut end of the cable through the grommet alongside the mirror cable.

Interior Cable Routing and Connection

1. Remove the driver's left-side dash panel to access the wiring path.
2. Run the cable down along the driver's side front window, zip-tying it to the existing cables.
3. Guide the cable into the left-side dash panel box.
4. Once the cable is secured and zip-tied, trim any excess length.

Ground and Power Connections

1. On the negative cable (black), crimp a small ring terminal connector and secure it to a ground connection inside the fuse box panel area.
2. Mount the charge controller inside the fuse panel box using two self-tapping screws.
3. Splice the two positive wires together using butt shrink connectors.
4. Apply additional heat-shrink wrap for enhanced durability and insulation.

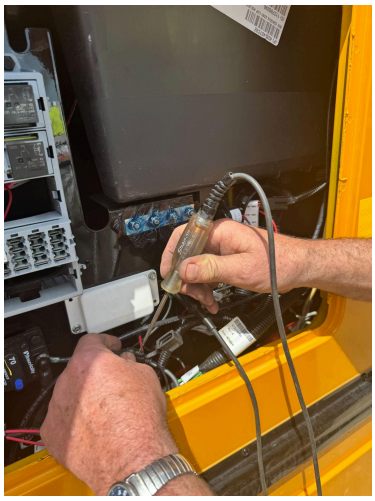
Cable Routing and Weatherproofing

1. On the roof, secure the solar cable from the panel directly to the rain gutter, ensuring a straight and clean run.
2. Use P-clips attached to existing screws along the rain gutter for added stability.
3. Apply white flex seal tape from the edge of the panel down to the rain gutter for secure adhesion.

Final Power Connection and Fuse Installation

1. Remove the fuse from the main panel and the fuse from the solar panel harness.
2. Secure the positive wire to the main positive cable that leads directly to the battery box, ensuring it bypasses the battery disconnect.
3. Reinsert the fuse in the main panel to complete the connection (do not insert the fuse in the solar harness at this time).

Final Inspection and Testing



1. Pull the bus outside before reinserting the fuse in the solar harness to ensure you have good lighting.
2. Use a multimeter to test that the system is working, verifying:
    - The panel and charge controller are producing voltage. Place the multimeter in DC voltage measurement mode. Place the negative lead of the multimeter on a ground connection and place the positive lead on the terminal in the fuse holder of the solar harness on the side with the wire leading to the solar panel. The voltage should be between 14.2 and 14.6V.

- The splice is connected correctly and is conducting electricity. Place the multimeter in DC voltage measurement mode. Place the negative lead of the multimeter on a ground connection and place the positive lead on the terminal in the fuse holder of the solar harness on the side with the wire leading to the bus's battery. The voltage should read the same as the bus battery voltage.

3. Once confirmed, proceed to install the fuse in the solar panel wiring harness.

You've completed a successful installation of a 50W or 100W SemiFlex Solar Panel!