ECO-WORTHY L03JYHLX4-BXS10A-1

ECO-WORTHY Solar Combiner Box Instruction Manual

Model: L03JYHLX4-BXS10A-1

1. Introduction

This manual provides detailed instructions for the installation, operation, maintenance, and troubleshooting of the ECO-WORTHY Solar Combiner Box. This device is designed to simplify the wiring of solar panel systems, enhance protection, and ensure reliable performance for both on-grid and off-grid applications, including RV setups. Please read this manual thoroughly before using the product.

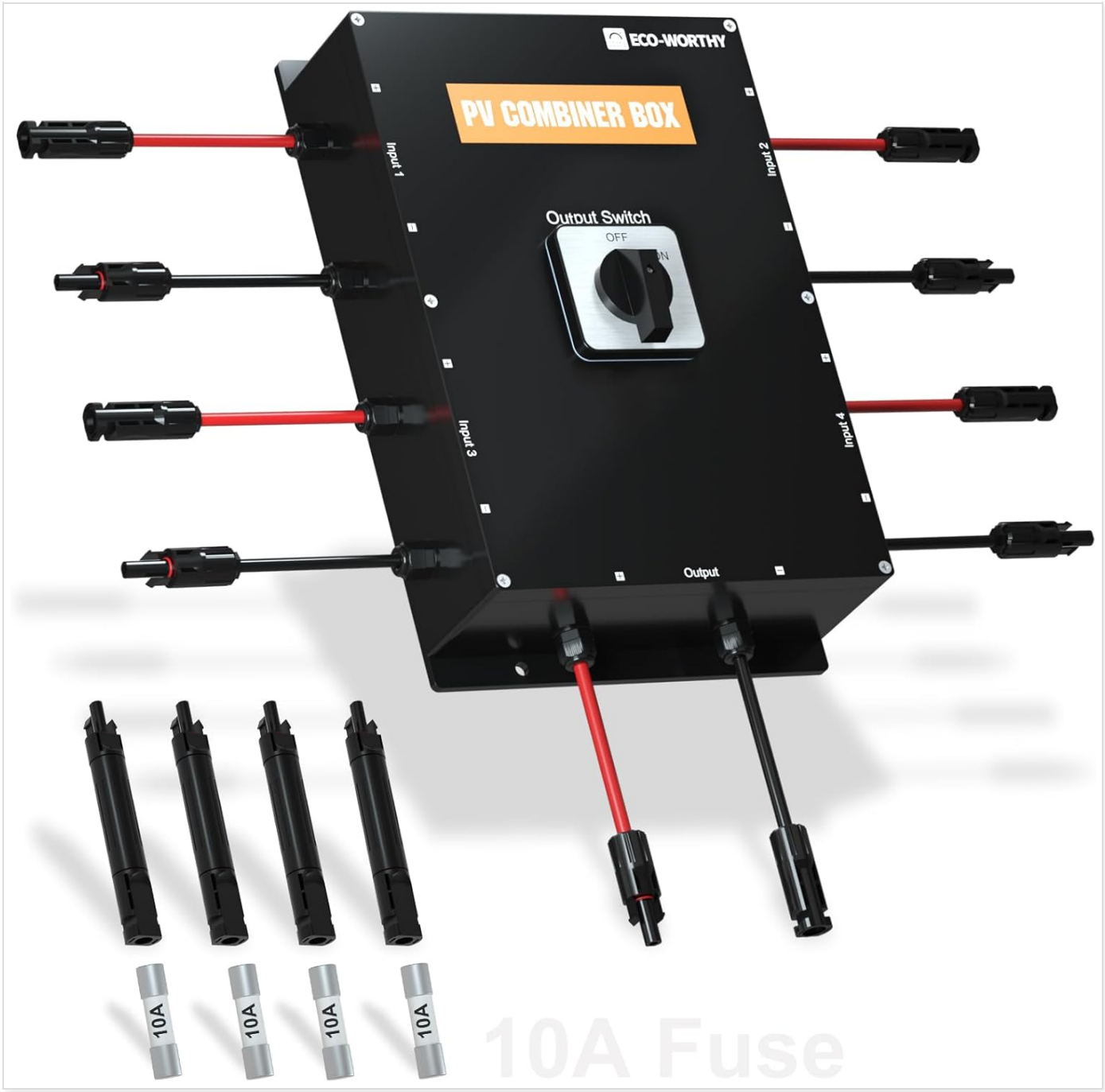


Figure 1: ECO-WORTHY 4-string PV Combiner Box with 10A Fuses.

2. Setup and Installation

2.1 Simplified Connection

The ECO-WORTHY Solar Combiner Box features a plug-and-play design with pre-wired cables, facilitating straightforward installation. It efficiently combines up to 4-string PV arrays, significantly reducing wiring complexity. Each input supports a maximum current of 10 A, making it particularly suitable for 100 W solar panels.

Figure 2: Key Features of the Combiner Box.

2.2 Component Configuration

Each solar combiner box package includes the following components:

- 4-string PV Combiner Box (x1)
- 60 A Toggle Disconnect Switch (integrated, x1)
- 10 A Fuse (x4)
- 9 AWG Cable (x1)

Note: An additional 60A solar cable may be required for optimal use with this combiner box.

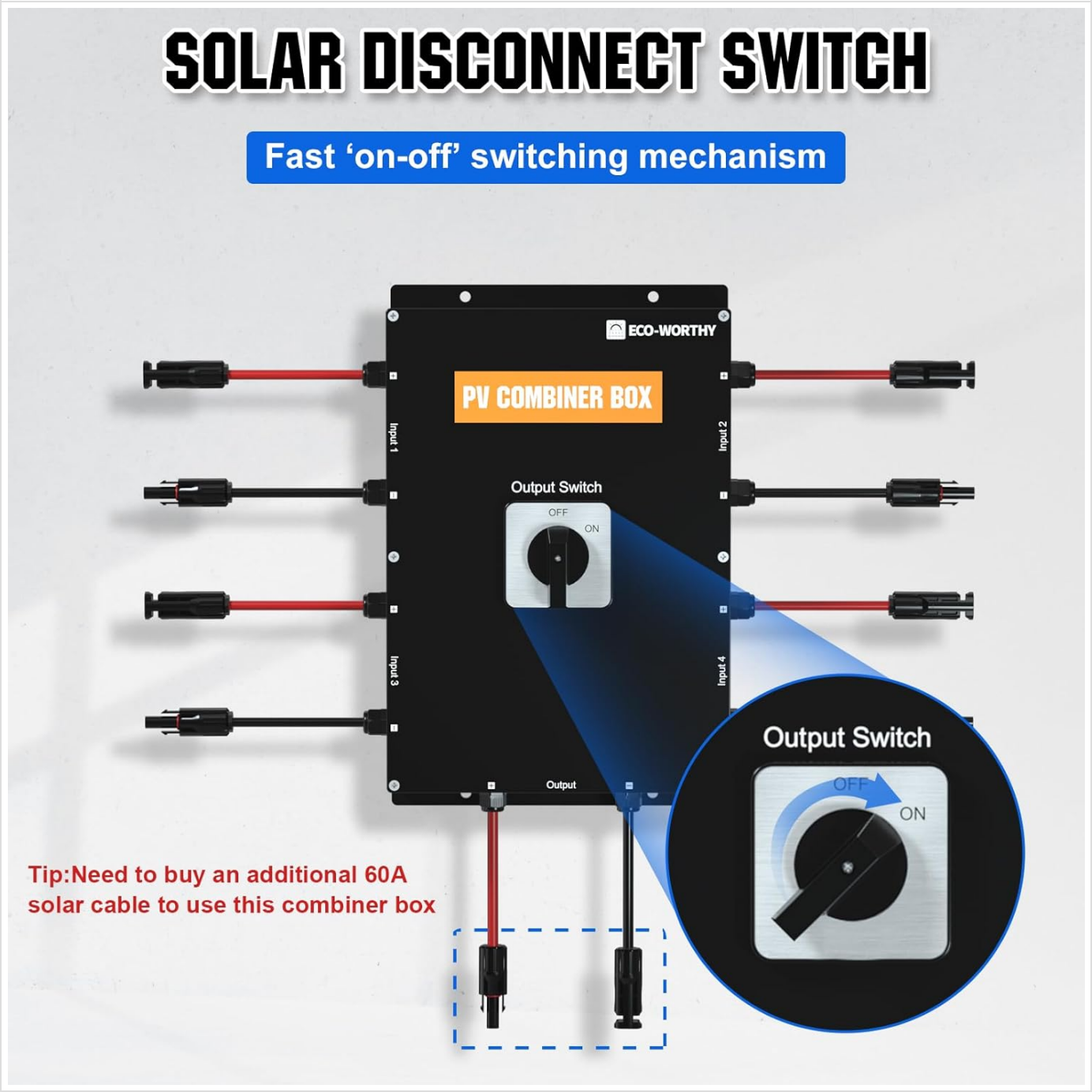


Figure 3: Solar Disconnect Switch.

2.3 Choosing Matching Fuses

It is crucial to select fuses that match the short-circuit current of your solar panels to ensure proper function and protection. The combiner box can utilize a maximum of 20A in-line fuses.

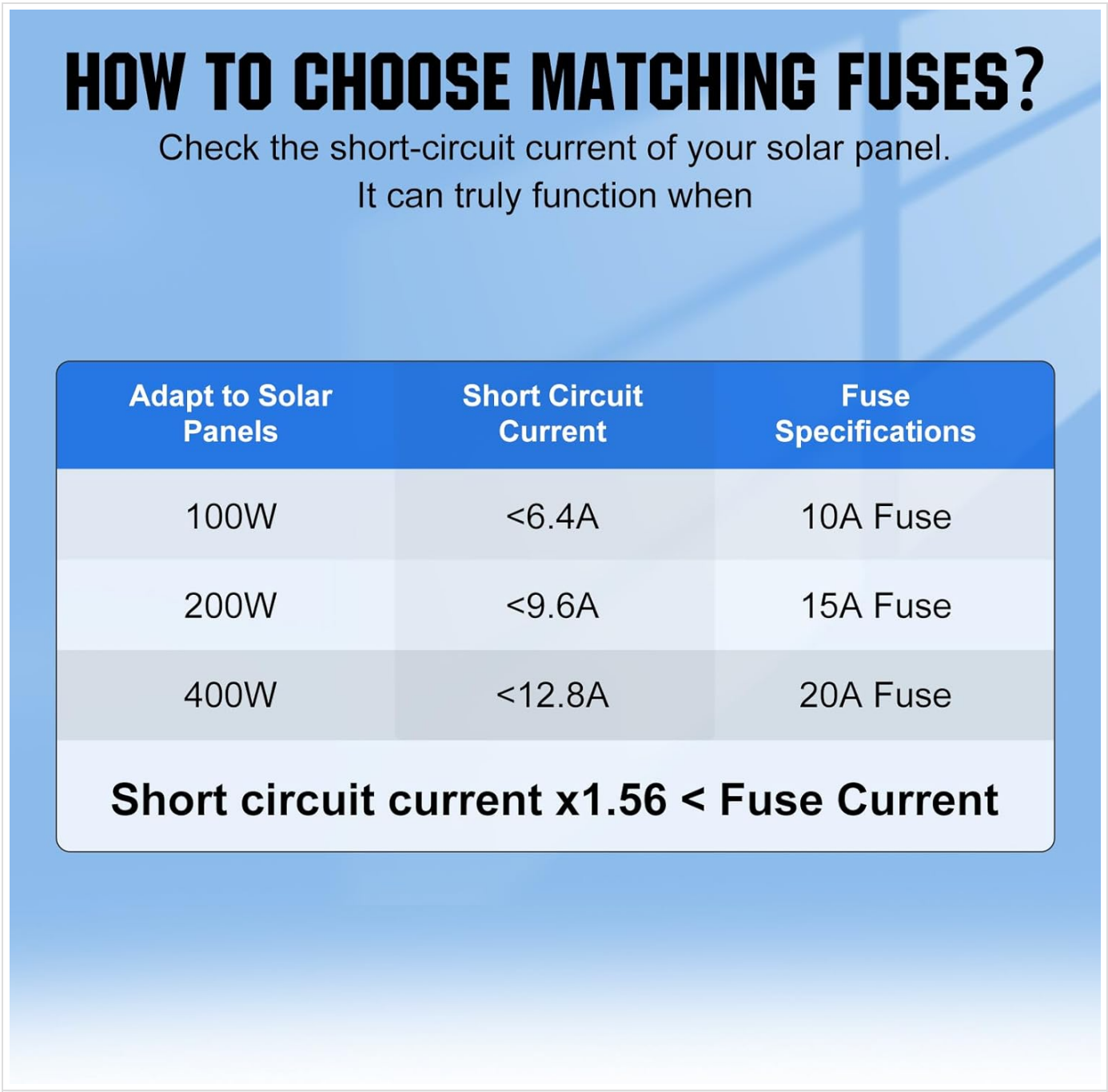


Figure 4: Fuse Selection Guide.

Table 1: Fuse Selection Based on Solar Panel Wattage

Adapt to Solar Panels	Short Circuit Current	Fuse Specifications
100W	<6.4A	10A Fuse
200W	<9.6A	15A Fuse
400W	<12.8A	20A Fuse
Formula: Short circuit current x 1.56 < Fuse Current		

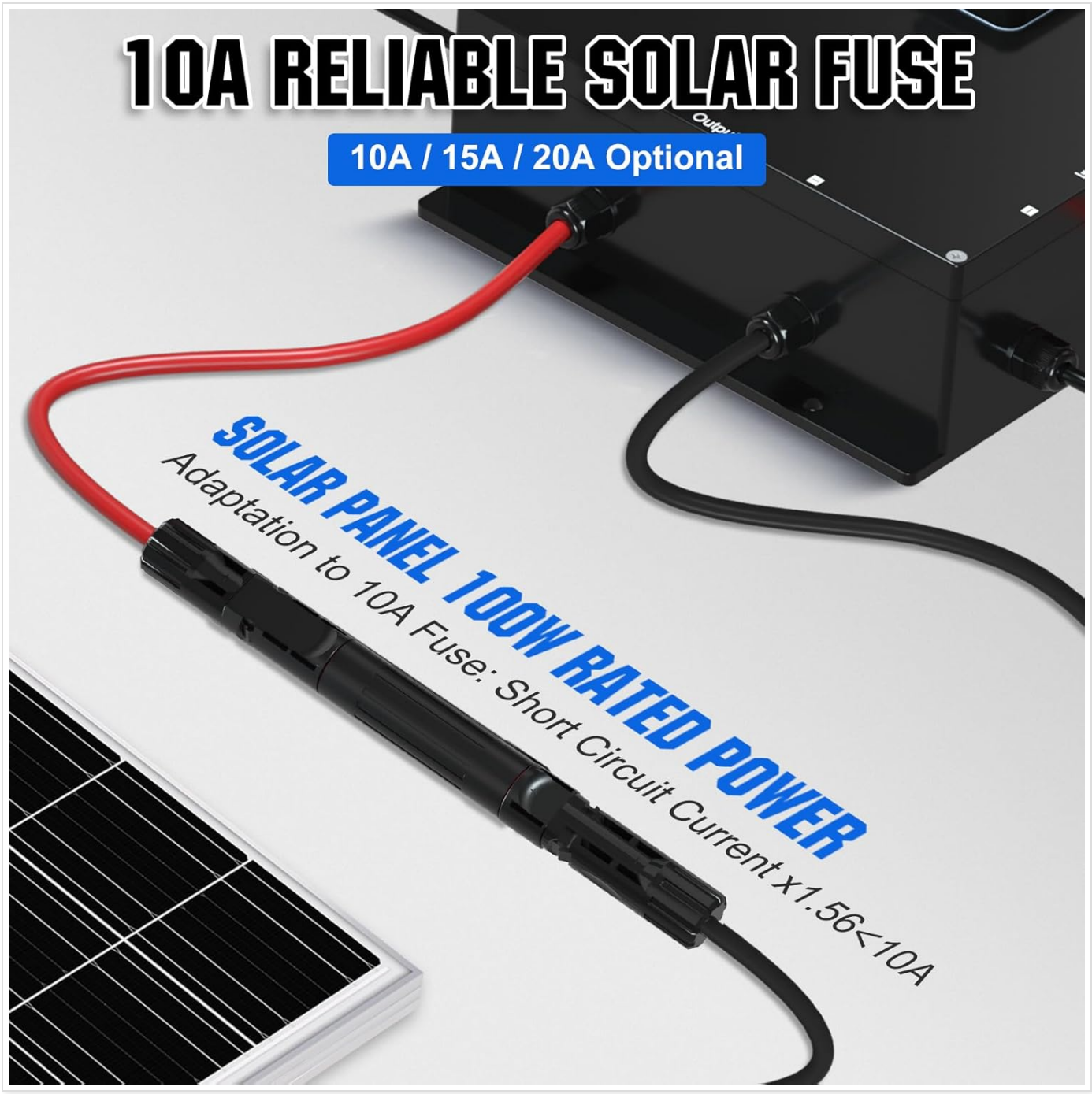


Figure 5: 10A Reliable Solar Fuse.

3. Operation

3.1 Enhanced Protection Features

The fuses within the solar combiner box offer multiple layers of protection, including short-circuit protection, overcurrent protection, and overvoltage protection. These features are designed to safeguard your solar panels and controllers, ensuring reliable operation under various environmental conditions.

3.2 Upgraded In-line Fuses

The 10A fuses are encased in durable PPO material, providing an IP67 waterproof rating to resist aging and UV damage. Their built-in latch design allows for plug-and-play functionality. The external placement of these fuses facilitates quick fault detection and timely replacement, minimizing downtime.

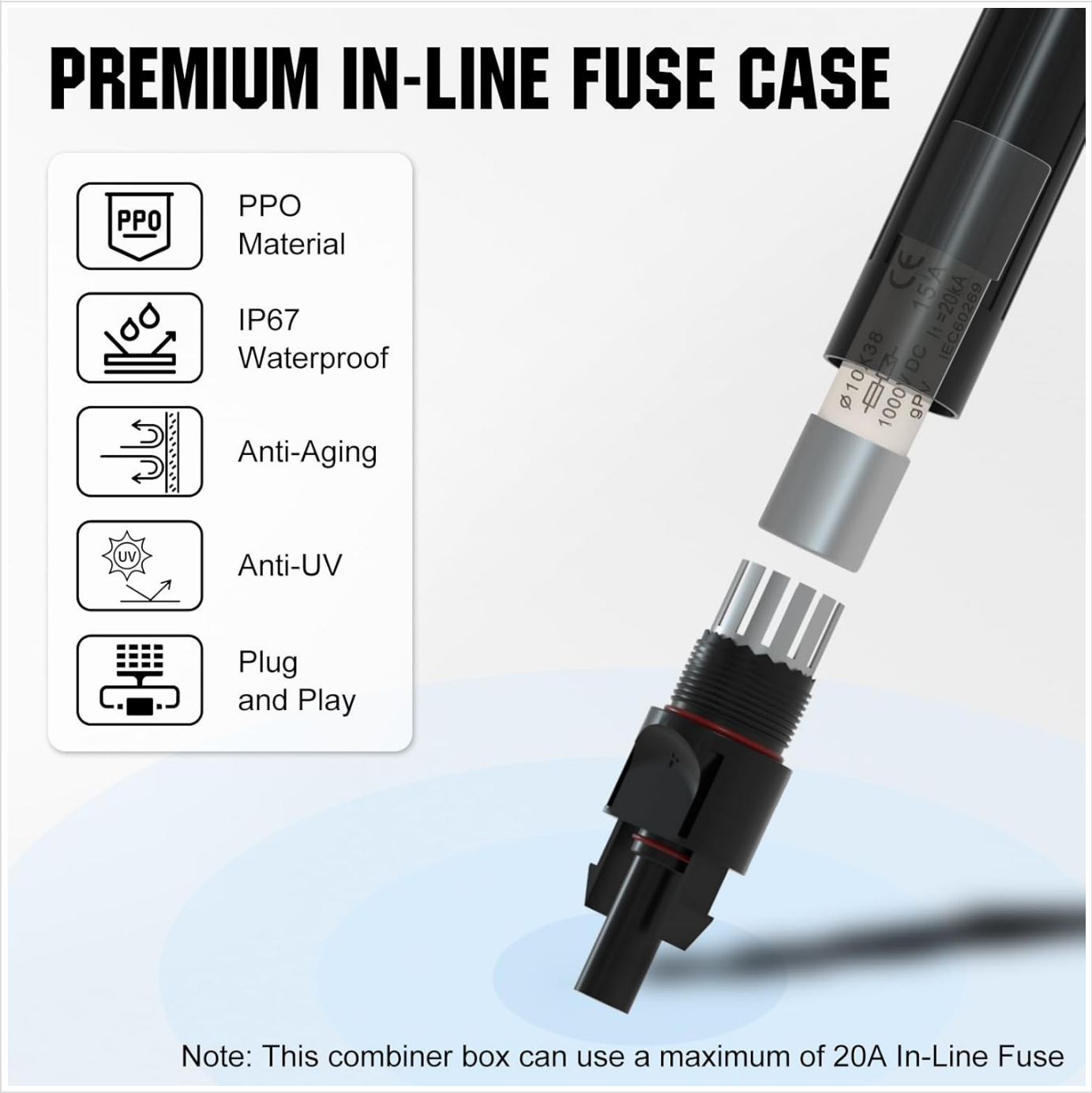


Figure 6: Premium In-Line Fuse Case.

3.3 Off-Grid Solar System Diagram

Below is a typical diagram illustrating how the combiner box integrates into an off-grid solar system, connecting solar panels to a charge controller and battery bank.

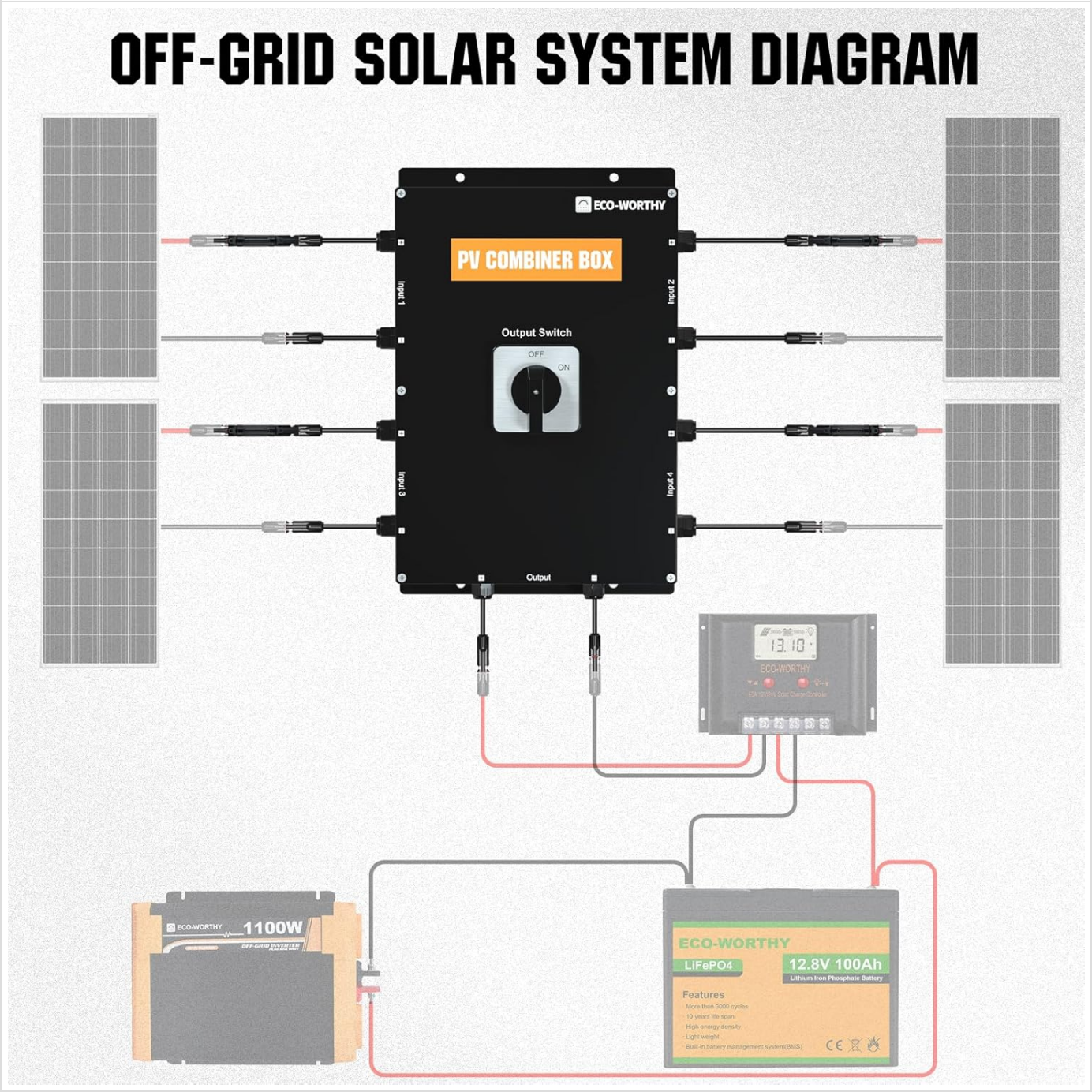


Figure 7: Off-Grid Solar System Diagram.

4. Maintenance and Safety Precautions

4.1 Rugged Outdoor Use

The solar combiner box is engineered for durability in outdoor environments. It features a sturdy, flame-retardant PVC shell and boasts an IP67 rating for water resistance. This robust construction ensures its suitability for both grid-connected and off-grid solar panel systems, as well as RV applications, withstanding various weather conditions.

Figure 8: Durability for Outdoor Use.

4.2 Precautions for Use

Adhere to the following precautions to ensure safe and effective operation:

1. Always connect fuses to the **positive terminal only** for safe operation.
2. It is recommended to turn off the disconnect switch during thunderstorms or if the system will be unattended for prolonged outdoor activities.
3. Before purchasing or installing, always check the short-circuit current of your solar panel. The combiner box and fuse combination will function optimally only when the calculation formula (Short circuit current x 1.56 < Fuse Current) is satisfied.

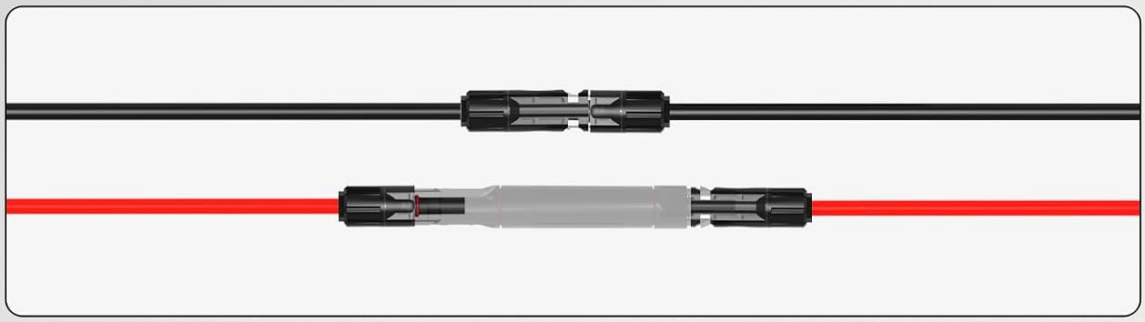
WARNINGS

1.Check the short-circuit current of your solar panel. It can truly function when

Short circuit current x1.56 < Fuse Current

Adapt to Solar Panels	Short Circuit Current	Fuse Specifications
100W	<6.4A	10A Fuse
200W	<9.6A	15A Fuse
400W	<12.8A	20A Fuse

2. The fuses can only be connected to the positive pole(+), not the negative pole(-)



3. Turn off the circuit breaker in thunderstorm weather

Figure 9: Important Warnings.

5. Troubleshooting

5.1 Importance of a Combiner Box

A solar combiner box is a critical component for the safety and efficiency of your solar power system. Without a combiner box, a short circuit in one panel can lead to significant damage to other panels and the charge controller, potentially causing fires. With a combiner box, the system is protected by fuses, which will burn out in case of an overload or short circuit, isolating the fault and preventing widespread damage.

Figure 10: System with vs. Without Combiner Box.

5.2 Common Issues and Solutions

Refer to the table below for a comparison of system behavior with and without a combiner box, highlighting potential issues and their resolutions.

Table 2: Combiner Box Impact on System Performance and Safety

	Using a Combiner Box	Do Not Use Combiner Boxes
Connection Method	Independent connections	Series and parallel connections
Voltage/Current	Slight fluctuations	Wild fluctuations
Overload Consequences	Fuse burnt	Solar panels and controllers burnt
Processing	Fuse replacement	PV system components replacement

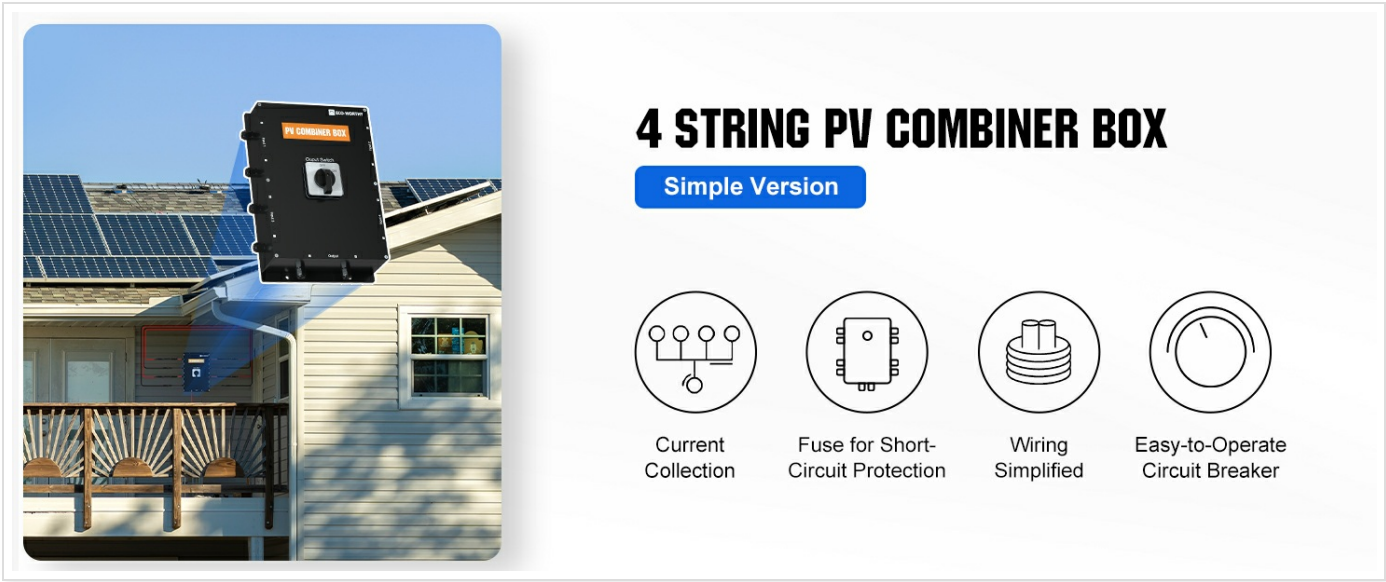


Figure 11: Combiner Box Comparison Table.

6. Specifications

Table 3: Product Specifications

Attribute	Value
Brand	ECO-WORTHY
Model Number	L03JYHLX4-BXS10A-1
Product Dimensions (L x W x H)	11.8" x 7.09" x 3.74"
AC Adapter Current	10 Amps
Material	Polyvinyl Chloride (PVC)
Number Of Circuits	4
Phase Type	Single Phase
Item Weight	36.8 pounds
Color	Black
Item Package Quantity	1
Included Components	Solar combiner box
Batteries Required?	No

7. Warranty and Support

For warranty information, technical support, or any inquiries regarding your ECO-WORTHY Solar Combiner Box, please refer to the contact information provided with your product packaging or visit the official ECO-WORTHY website. Our customer service team is available to assist you with any questions or concerns.