ECO-WORTHY US-DCDC1240-1

ECO-WORTHY 12V 40A DC to DC Charger with Solar Charge Controller Built-in User Manual

Model: US-DCDC1240-1

1. Introduction

The ECO-WORTHY 12V 40A DC to DC Charger with Solar Charge Controller Built-in is a versatile and efficient power management solution designed for various battery types including AGM/GEL, lead acid, lithium, and calcium batteries. This 2-in-1 charger integrates both generator starting battery input and solar panel input, providing multi-stage charging capabilities for optimal battery health and longevity. It is ideal for use in RVs, campervans, motorhomes, and travel trailers, ensuring your leisure batteries are always charged, whether on the road or off-grid.

Figure 1.1: ECO-WORTHY 12V 40A DC to DC Charger.

2. Key Features

- **Multi-input Efficient Charging:** Features both generator starting battery input and solar panel input, capable of charging AGM/GEL, lead acid, lithium, and calcium batteries.
- **Intelligent MPPT Charging:** IP65 waterproof design with an MPPT solar intelligent control management system that records user charging habits.
- **One-Way Charging:** Ensures enhanced safety with isolation for primary and secondary batteries, preventing reverse charging and power consumption from the house battery.
- **Comprehensive Protection Measures:** Includes engine start battery low-voltage protection, overcharging, and short-circuit protection to extend battery lifespan.
- **Easy to Use:** Clearly labeled wiring for solar panels, alternator, and battery, with indicator lights for normal charging connections and easy identification of abnormal connections.

3. Safety Information

Please read all safety instructions carefully before installing or operating the charger. Failure to do so may result in injury or damage to the product or connected systems.

- Ensure all connections are secure and properly insulated to prevent short circuits.
- Always disconnect power before making or breaking connections.
- Install the charger in a well-ventilated, dry area, away from flammable materials.
- Do not expose the charger to water or excessive moisture. The unit is IP65 rated for water resistance, but direct

submersion or high-pressure water jets should be avoided.

- Use appropriate circuit breakers and fuses as recommended in the installation section to protect the system.
- Keep out of reach of children.
- Consult a qualified professional if you are unsure about any installation or wiring procedures.

4. Package Contents

Verify that all items are present in the package:

- ECO-WORTHY 12V 40A DC to DC Charger with Solar Charge Controller
- User Manual
- Wiring Harness (pre-attached, labeled for DC Input, Solar Input, Output, and Ground)
- Mounting Brackets and Screws (not explicitly mentioned but implied for installation)

Figure 4.1: The charger supports dual input from solar panels and automotive alternators.

5. Setup and Installation

5.1. Installation Location

Locate a suitable dry area in your vehicle or caravan for installing the DC-DC charger. Ensure the location allows for proper ventilation and is protected from direct exposure to weather elements. The charger can be mounted overhead, vertically, or horizontally using the provided brackets.

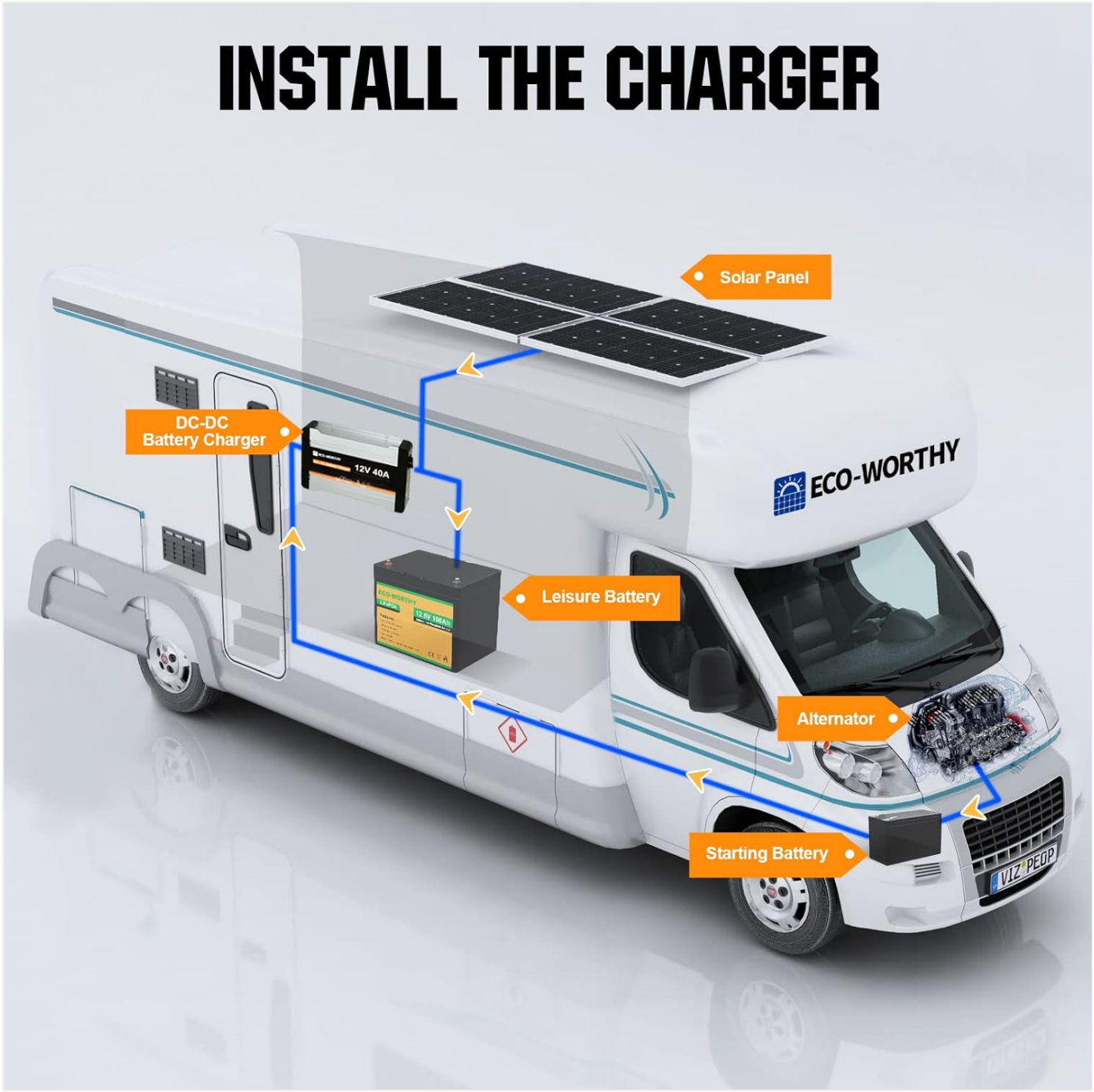

Figure 5.1: Suggested installation within an RV, showing connections to solar panel, leisure battery, and alternator.

5.2. Wiring Connections

The charger comes with clearly labeled wiring for easy connection. It is recommended to use twin core wiring and suitable cable connectors (not included) for all connections. Ensure all connections are tight and secure.

- **DC Input (Red):** Connects to the positive terminal of the main starting battery.
- **Solar Input (Brown):** Connects to the positive terminal of the solar panel.
- **Output (Blue):** Connects to the positive terminal of the auxiliary (leisure) battery.

- **Ground (Black):** Connects to the negative terminal of the main starting battery, solar panel, and auxiliary battery.

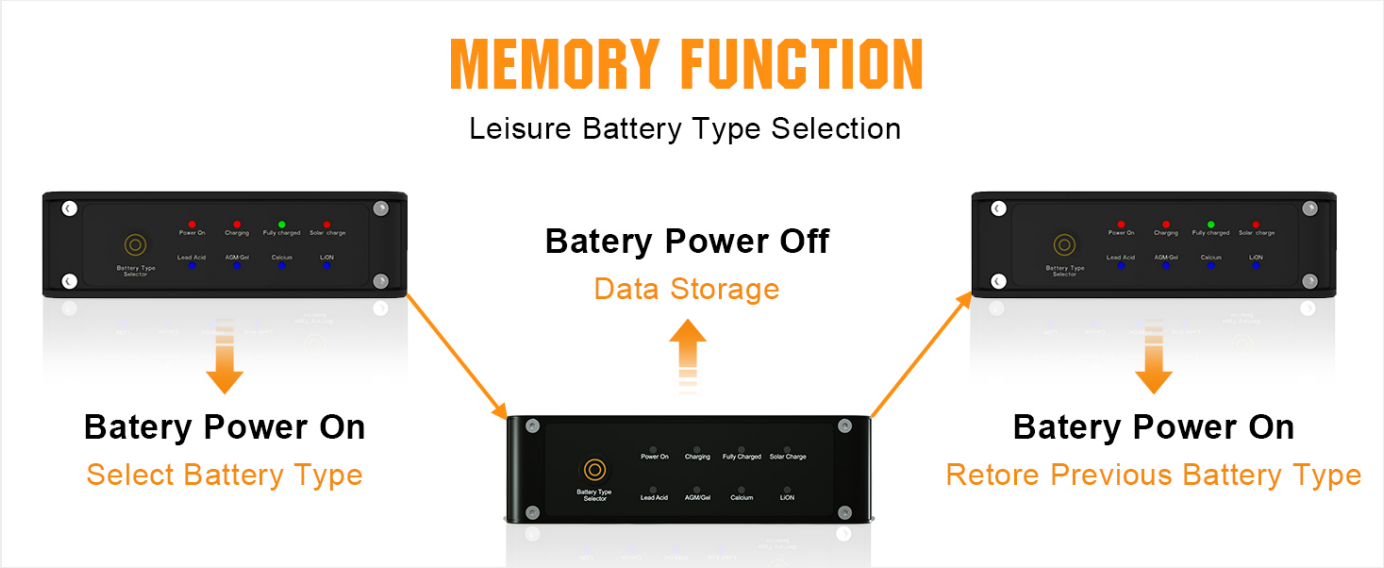

Figure 5.2: Detailed wiring connections for solar panel, leisure battery, and starter battery.

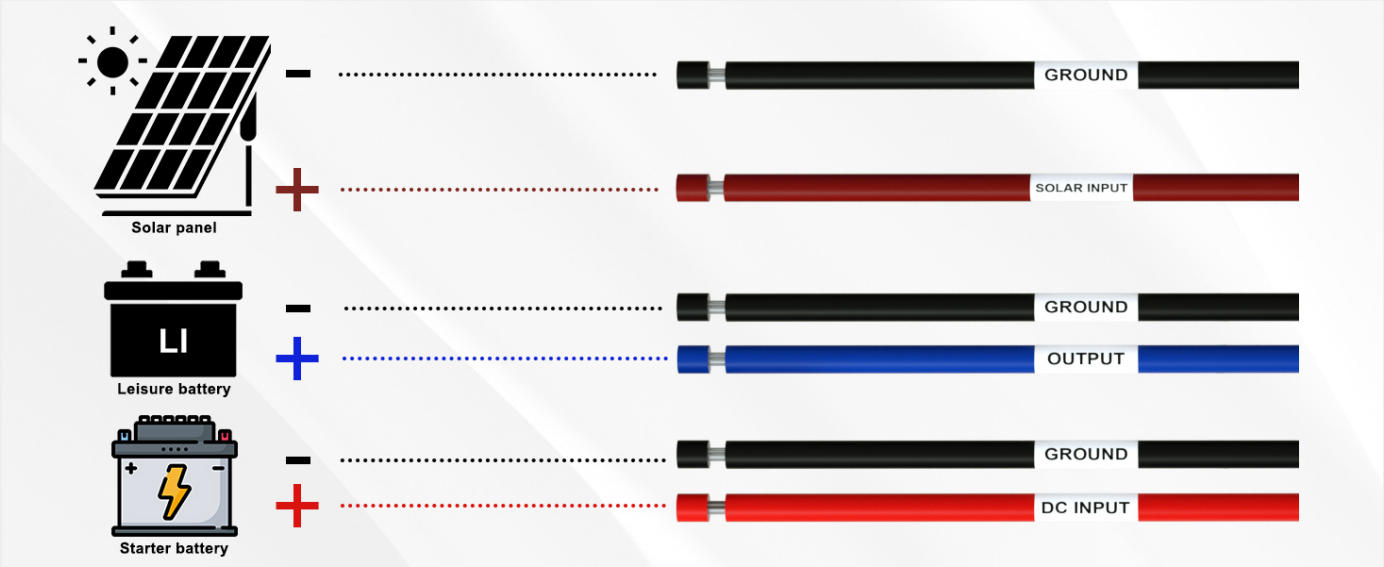

Figure 5.3: Overview of wiring and product parameters.

5.3. Battery Type Selection

The charger supports multiple battery types. After connecting the leisure battery, hold down the "Battery Type Selector" button for 3 seconds to select the appropriate battery type. The corresponding indicator light will illuminate.

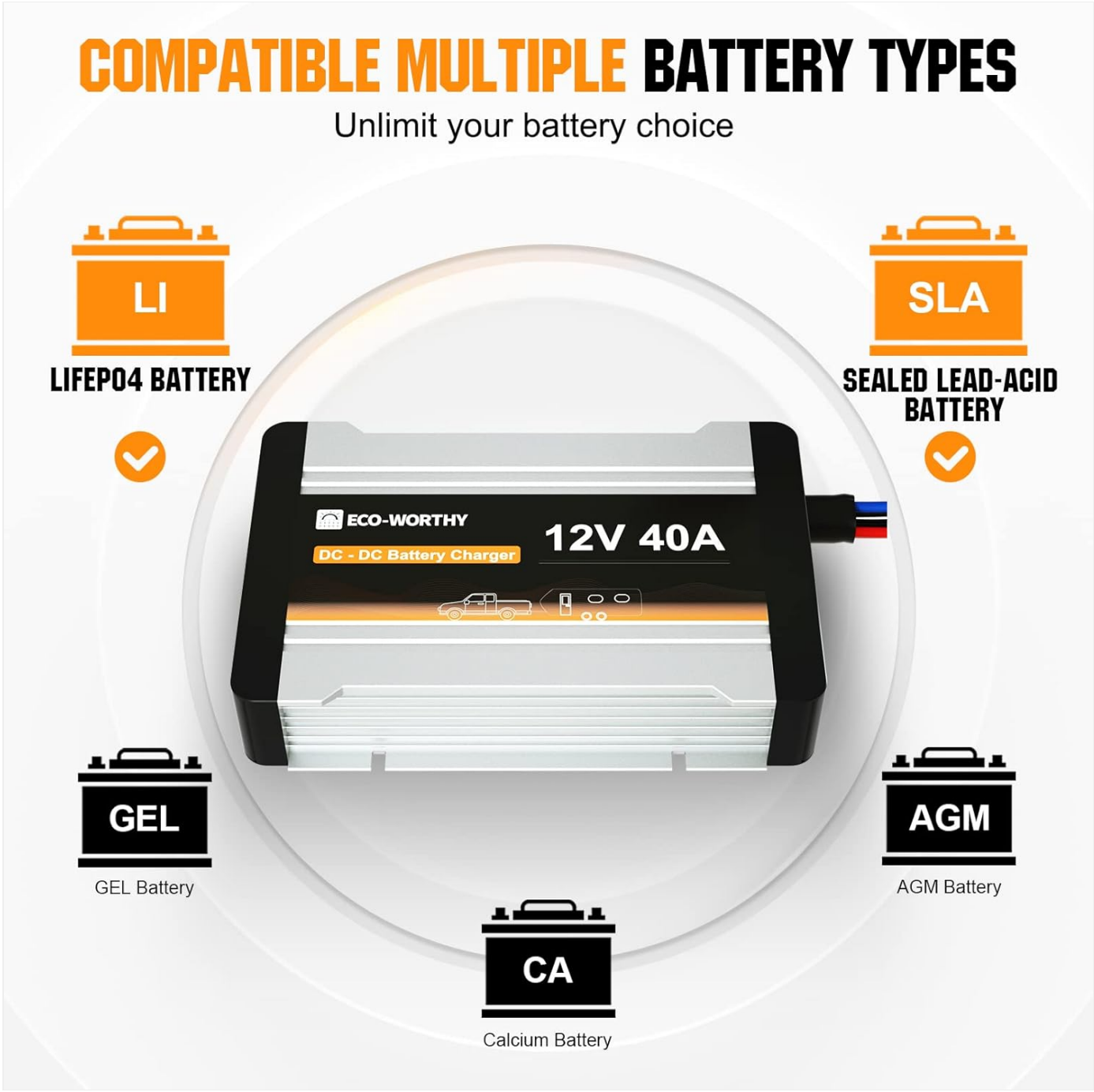

Figure 5.4: The charger is compatible with LiFePO4, SLA, GEL, AGM, and Calcium batteries.

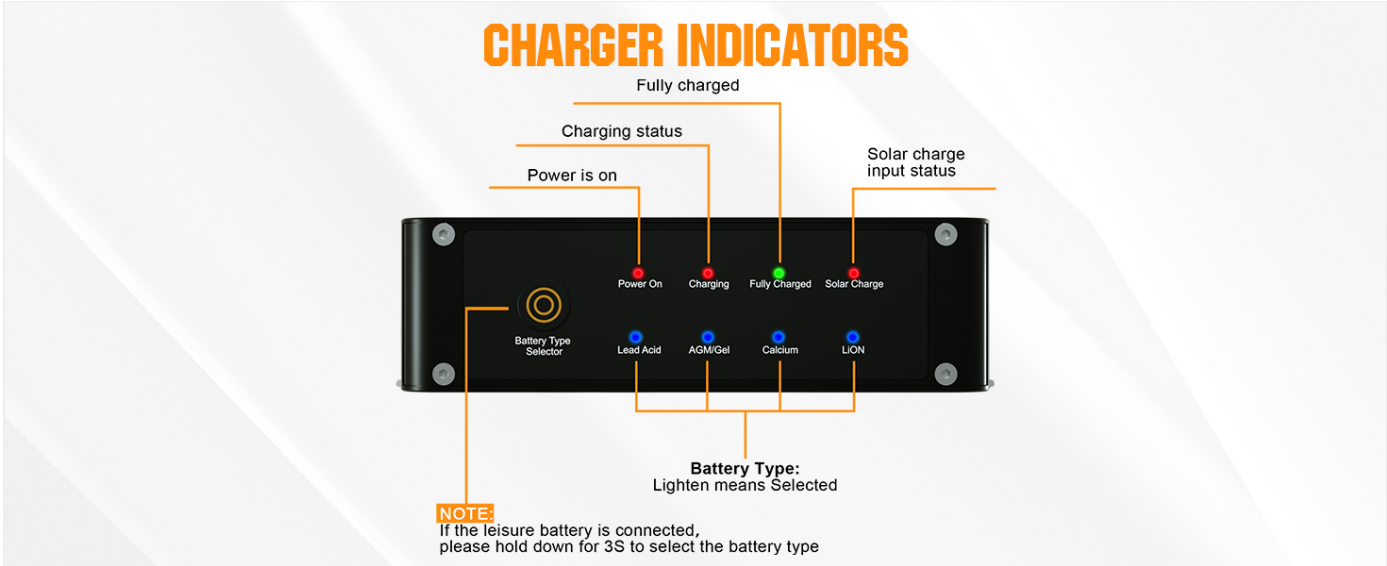

Figure 5.5: The charger features a memory function to store the selected battery type.

Figure 5.6: Explanation of the charger's indicator lights for power, charging status, and battery type selection.

6. Operating Instructions

6.1. Charging Logic (Alternator and Solar)

The ECO-WORTHY DC-DC charger intelligently manages charging from both the alternator and solar panels. It prioritizes charging from the alternator when the starter battery voltage is above 12.5V. If the starter battery voltage drops below 12.5V, or if the solar input conditions are met, it will switch to solar charging.

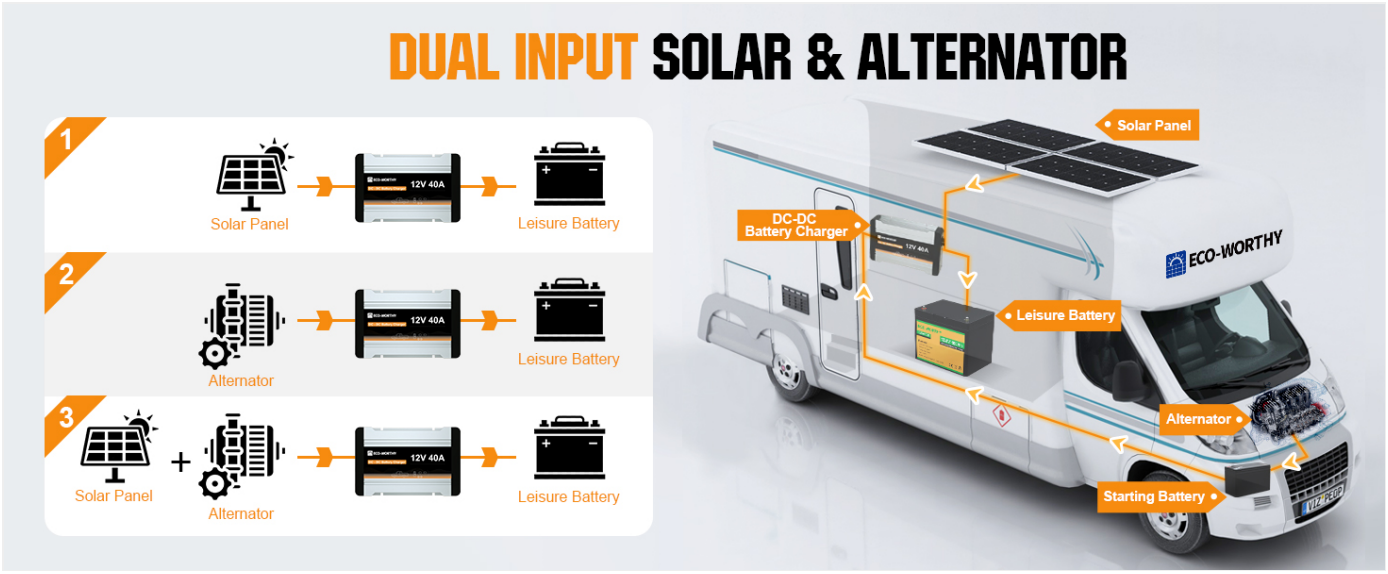

Figure 6.1: Visual representation of dual input charging from solar and alternator.

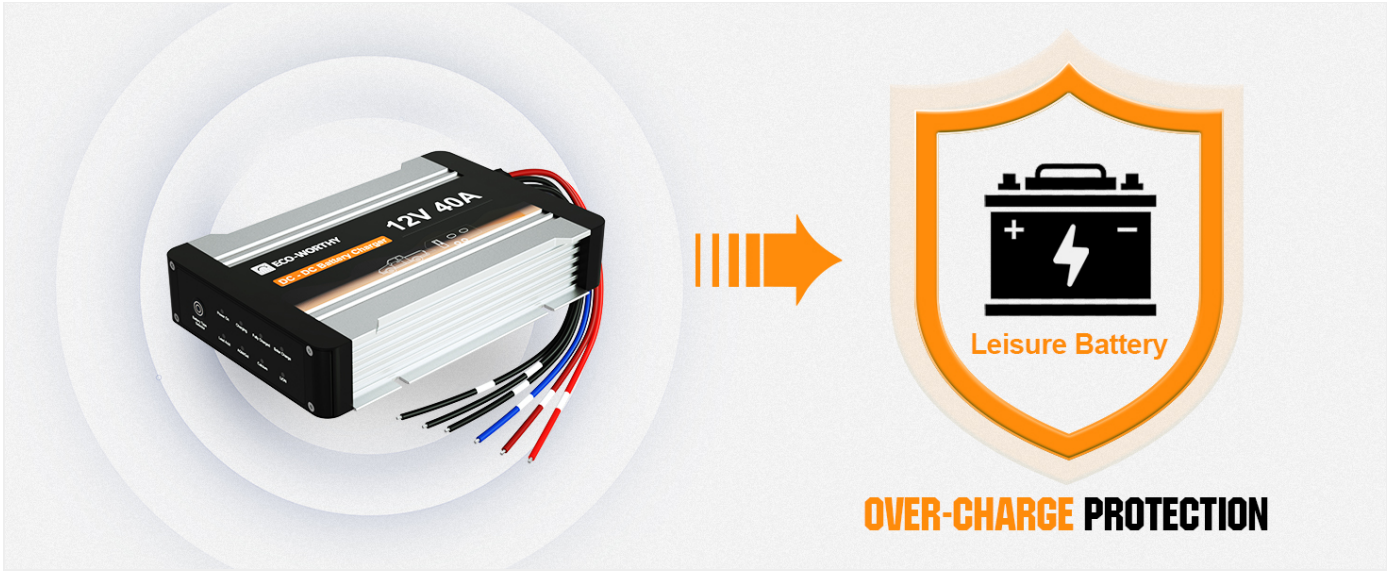

Figure 6.2: The charger protects the starter battery by cutting off output if its voltage drops below 12.5V.

6.2. Charging Conditions Table

The following table outlines the charging behavior based on leisure battery level, solar input voltage, and starter battery voltage:

Figure 6.3: Table detailing when the charger will use vehicle alternator or solar charging.

6.3. Charging Time

The charging time depends on the capacity of your leisure battery and the available input power. For example, a 12V 200AH battery can be fully charged in approximately 5 hours with optimal conditions.

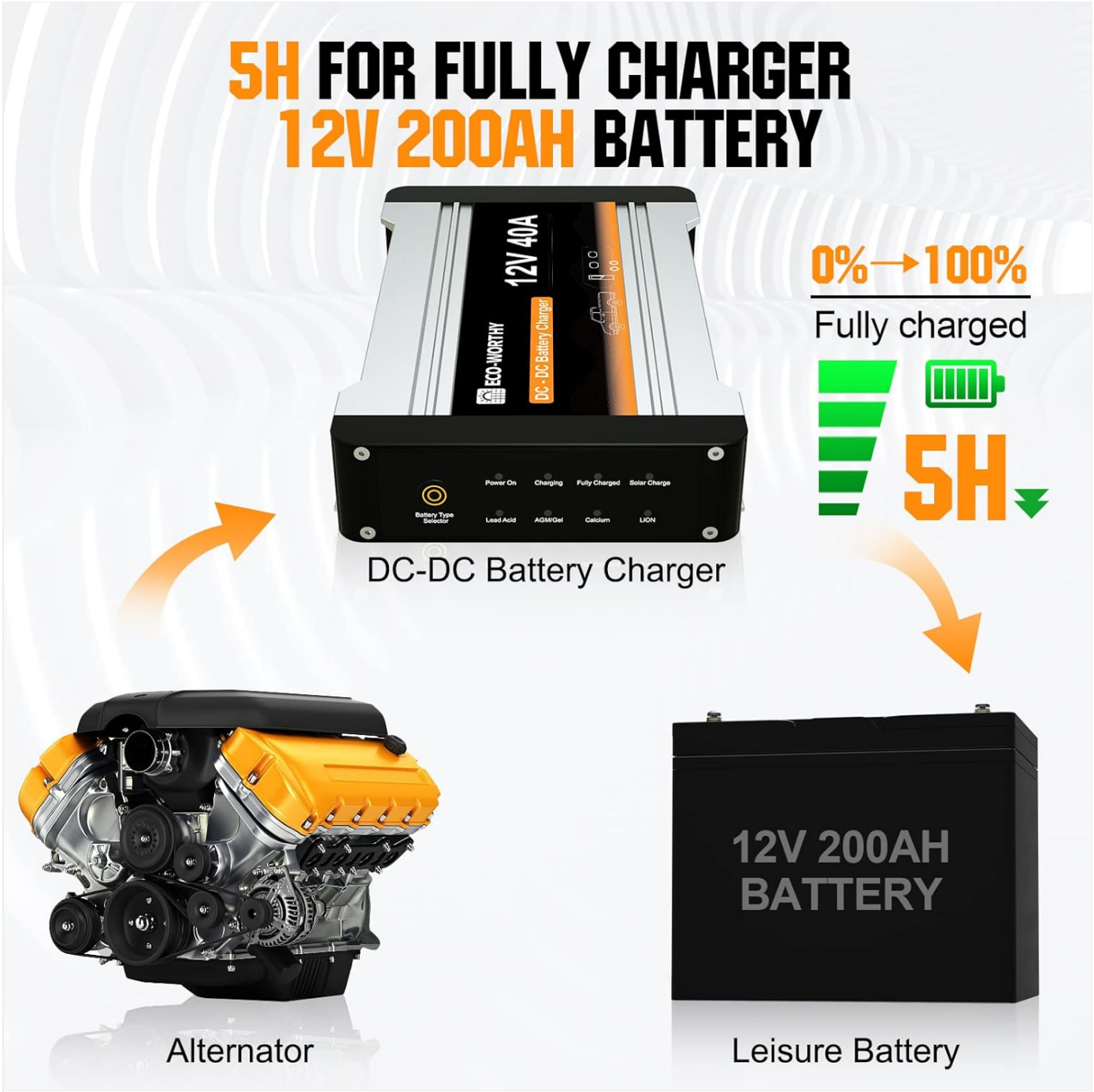

Figure 6.4: Example charging time for a 12V 200AH leisure battery.

6.4. Official Product Video

Watch this official video from ECO-WORTHY US to understand how the DC-DC Battery Charger works:

Your browser does not support the video tag.

Video 6.1: How the ECO-WORTHY DC-DC Battery Charger Works.

7. Maintenance

Regular maintenance ensures optimal performance and longevity of your ECO-WORTHY DC-DC Charger.

- **Cleanliness:** Keep the charger clean and free from dust and debris. Use a dry, soft cloth for cleaning.
- **Connections:** Periodically check all wiring connections to ensure they are tight and free from corrosion. Loose connections can lead to poor performance or damage.
- **Ventilation:** Ensure the installation area remains well-ventilated and that the cooling fins are not obstructed.

- **Environmental Conditions:** While the unit is IP65 waterproof, avoid prolonged exposure to extreme temperatures or direct water spray.

8. Troubleshooting

If you encounter issues with your ECO-WORTHY DC-DC Charger, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Charger not turning on / No indicator lights	No input power; Loose connections; Blown fuse.	Check input voltage from both alternator and solar. Verify all wiring connections are secure. Inspect and replace any blown fuses or tripped circuit breakers.
Low output current / Not charging at full 40A	Input voltage too low; Battery type misconfigured; Cable gauge too small.	Ensure alternator output is sufficient (ideally 14.4V or higher for full 40A). Verify correct battery type is selected on the charger. Use appropriate gauge wiring as per specifications.
Charger cycles on and off frequently	Starter battery voltage fluctuating below 12.5V; Overheating.	Check the starter battery health and charging system. Ensure adequate ventilation around the charger to prevent overheating.
Leisure battery not fully charging	Incorrect battery type selected; Battery degradation; Insufficient charging time.	Confirm the correct battery type is selected. Test the leisure battery's health. Allow sufficient time for charging based on battery capacity.

Figure 8.1: The charger includes multiple protection features for safety.

9. Specifications

Feature	Detail
Brand	ECO-WORTHY
Model Number	US-DCDC1240-1
Input Voltage (DC Battery)	12.5-16V
Input Voltage (Solar)	16-25V
Output Voltage	14.4-15.4V
Output Current (DC/Solar)	40A
Supported Battery Types	AGM/GEL, Lead Acid, Lithium (LiFePO4), Calcium
Product Dimensions	8.18 x 5.4 x 1.4 inches
Item Weight	2.92 pounds
Material	Metal
IP Rating	IP65 (Waterproof)

10. Warranty and Support

For technical problems or solutions not found in this manual, please contact ECO-WORTHY customer support.

- **Email:** customer.service@eco-worthy.com
- **Phone (US):** 1-866-609-8222
- **Phone (UK):** +44 20 7570 0320
- **Phone (DE):** +49 693 1090 113

Please refer to your purchase documentation for specific warranty terms and conditions.