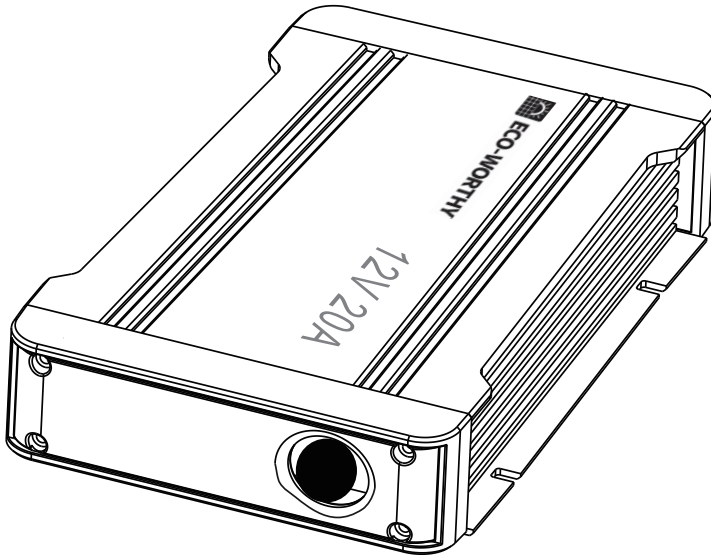




ECO-WORTHY

DC to DC Battery Charger

User Manual



SUPPORT

If you are experiencing technical problems and cannot find a solution in this manual, please contact ECO-WORTHY for further assistance.

·Call: 1-866 939 8222(US)

+44 20 7570 0328(UK)

+49 693 1090 113(GE)

·Email: customer.service@eco-worthy.com

A WARNING!
To avoid any personal injury, please read the safety instructions below.

This battery charger is not intended for use by children or infirm persons without supervision.

FOR AUTOMOTIVE AND RECREATIONAL VEHICLE 12V DEEP CYCLE BATTERY USE ONLY.

NOT TO BE USED WITH DRYCELL BATTERIES.

- During the charging process, do not use a naked flame near a battery. Batteries generate explosive gasses during the charging process that may explode. , Never smoke or light cigarettes near a battery.
- Do not place tools on top of a battery or allow tools to fall on the battery to prevent the chance of a short circuit and sparks.
- Always wear eye protection when charging a battery.
- Ensure charging and testing is conducted in a well-ventilated area.
- Inadequate ventilation may over-heat the charger and cause in-efficient operation.

, This battery charger is not intended for outdoor operation. Do not expose it to moisture or extreme weather conditions.

- The ACID/FLUID within a battery is highly corrosive and poisonous. It can produce flammable and toxic gases when recharged and will explode if ignited. When working with batteries, always wear eye protection, remove jewellery and ensure the area is well ventilated. If spilt - it will cause severe burning to eyes, skin, clothing, damage paintwork and corrode many metals. Ensure that power is disconnected from any appliance in the vicinity of the spill and immediately wash any area that has been affected with water.

The warnings, cautions and instructions detailed in this instruction manual cannot cover all possible conditions and situations that may occur. Common sense and caution are factors which cannot be built into this product and must be supplied by the operator.

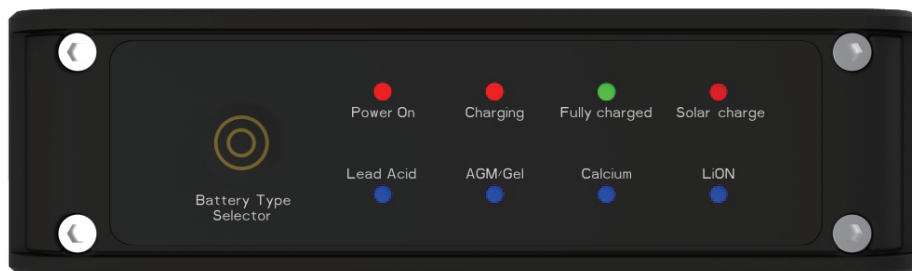
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Key Charger Features

This DC-DC charger is a sophisticated multi stage charger, utilising switch mode

and fully automatic computerised control, designed to charge most 12 Volts AGM/Gel, Lead Acid LION and Calcium batteries.



- Heavy duty aluminium case and mounting brackets
- Microchip monitoring and control
- Fully automatic high frequency multi stage charging
- Pulse mode technology that reduces oxidation, evens electrolyte consistency and minimises temperature equating to longer battery life
- Easy push button chemistry select: AGM/Gel, Calcium, LiQND Deep Cycle, VRLA and conventional flooded Lead-Acid batteries
- Internal charger temperature monitoring and power output control
- LED indicators showing state of charge
- Over charging, short circuit and over temperature protection
- Reverse polarity protection:
 1. Input reverse polarity protection
 2. Output reverse polarity protection

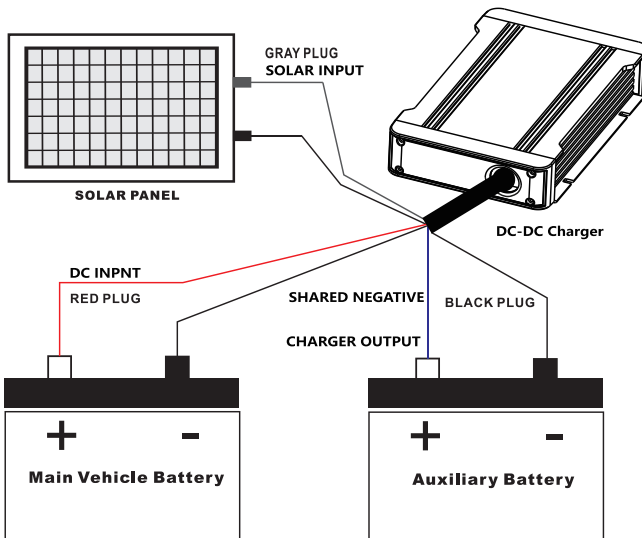
- Thermal overload protection
- Solar Eput overload protection
- Power cut memory function: once selected, the charger will remain on this battery type until it is changed

Installation Options/Instructions

Installing the Charger

Installation of this unit will require twin core wiring - and suitable cable connectors (not included). See specifications page for details.

Any existing cables used in conjunction with this charger will require checking to ensure size is suitable gauge. Where necessary replace with suitable gauge wiring if they do not meet minimum specifications.



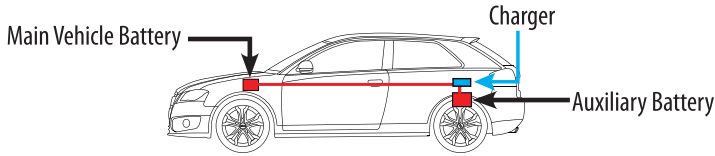
- Locate where you are going to install the DC-DC charger. Ensure the charger is located in a suitable dry area in the vehicle or caravan.
- Ensure the charger is securely mounted using the brackets and screws provided. Charger can be mounted overhead, vertically or horizontally.

- Next, measure required cable length from the main vehicle battery through to the location of the DC-DC charger.
- Ensure ALL cabling meets specification and will not be exposed to excessive heat/moving parts or abrasion.
- If the charger is located in a camper/caravan we recommend the use of an Anderson style plug between the tow vehicle and the camper/caravan as shown below.
- Fit suitable connectors on either end of the twin core cables.
- Connect the auxiliary battery to (-) shared negative and (+) charger output using twin core wiring as per recommended cable size.

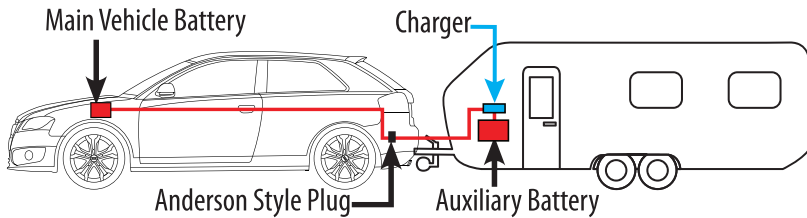


- Using the twin core wiring laid between the main starting battery and the DC-DC charger, connect the red (+) to the (+) DC input terminal and the black (-) to the (-) shared negative on the rear of the charger. Finally, make the power connections to the main starting battery of the vehicle. It is recommended to install a 25 Amp circuit breaker (not included) as shown on main diagram. The circuit breaker should be located close to the starting battery.
- Check all connections are tight.

Suggested fitment to vehicle only



Suggested fitment to vehicle with caravan



DC-DC Charger Installation:

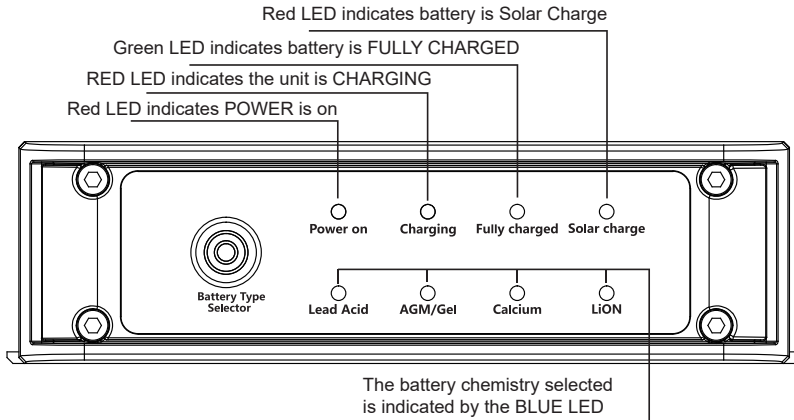
- This DC-DC charger has two modes: DC input and solar input. You can select DC input mode or solar input mode first when installing.
- Select the battery type to be charged on the charger panel.
- Connect the auxiliary battery to the output port of the DC-DC charger.

DC-DC Charger Removal :

- If you need to remove the charger or battery, please remove the negative pole of the auxiliary battery first, and then remove the double room.
- Remove the DC input port or solar input port of the charger. Both input ports can be removed first.

Operating The Charger

CHARGER DISPLAY:



1.DC Battery

Once correctly installed, the DC-DC charger is a simple set and forget dual battery switch.

- Start the vehicle and let it idle.
- The charger will now recognise that there is charge being applied to the main starting battery.
- Once the main starting battery has reached 13.0volts the charger will begin to charge the auxiliary battery.
- The initial default setting isfor AGM/Gel batteries.
- If you are charging a battery with a different chemistry simply change the battery type by pressing the battery type selector button on the front panel of the charger. But before connecting the auxiliary battery to select the battery type.
- Once selected, the charger will remain on this battery type until it is changed.
- The charger will continue to operate even after the vehicle has been switched off, however once the main starting battery falls below15.0volts the charger will automatically shutoff.

2. Solar Input

Once correctly installed, the DC-DC charger is a simple set and forget dual battery switch.

- Once connect the input terminal with solar panels positive and negative, the charger will transfer to solar charge mode.
- If you are charging a battery with a different chemistry simply change the battery type by pressing the battery type selector button on the front panel of the charger. But before connecting the auxiliary battery to select the battery type,
- Solar charging requires an input of 16 to 25 volts from solar panels. When available solar panel voltage falls below 16 volts no charge will be delivered to auxiliary battery.

Specifications

Model: ECO-DCDC1220	
Type:	Multi Stage
Input:	DC Battery: 12.4-16.0 Volts Solar Input: 16.0-25.0 Volts
Output/Charging Voltage:	14.4-15.4 Volts (Stops charging when alternator output or vehicle battery below 12.4 Volts)
Output Current:	DC Output: 20A Solar Output: 20A
Minimum Start Voltage:	2.0Volts - For battery being charged
Charge Control	
Soft Start:	Yes
Soft Charge Current:	20A
Bulk Charge Voltage:	14.7V (AGM/Gel) 14.4 V (Lead Acid) 15.4V (Calcium) 14.4V(LiON)
Absorption:	Constant voltage with automatic amperage control
Equalisation:	Automatic
Float Charge Voltage:	13.5V (AGM/Gel) 13.5V (Lead Acid) 13.5V (Calcium)
Float Charge Current:	100mA
Battery Range:	18to250Ah

Cable Length/Twin Core

0 -1 Metres:	12AWG
1 - 5 Metres:	8AWG
5 Metres +:	6AWG

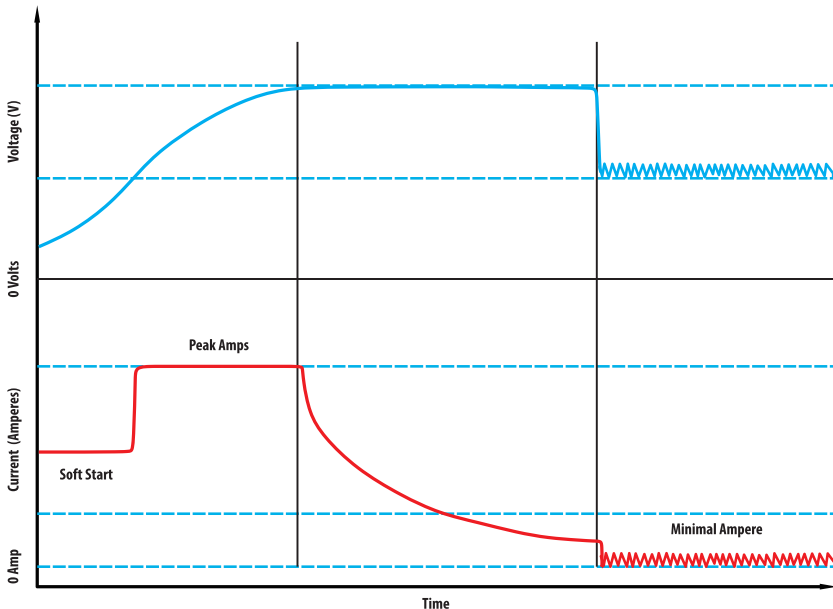
A WARNING!

•Failure to use recommended wiring will severely impact on performance of DC to DC charger.

•When the positive and negative poles of the charger are reversely connected to the positive and negative poles of the battery, the charger will beep

•When the charger is fully charged for the auxiliary battery, the voltage drops too fast, the system will judge it as a bad battery, and the charger will beep

•When the charger is charging the auxiliary battery, the auxiliary battery will be fully charged quickly, then the system will determine that the battery is a bad battery, and the charger will beep



Charging algorithm will change according to battery type.

Additional Information

It is expected that this charger will be used to charge a 'deep cycle' type auxiliary battery. Deep cycle batteries are designed to provide battery power to run items like fridges and lighting in caravans and campers.

An ordinary compressor refrigerator consumes 5 amps, so it uses about 120 amps in 24 hours. Therefore, if the 100Ah battery only runs in the refrigerator (and there will be no other output), ideally, the battery needs to be charged after 20 hours.

To replenish these 80 amp hours using a 20 amp DC-DC charger will require at least 5 hours of driving. A twenty amp unit will require at least 2.5 hours of driving to fully recharge the battery.

The readings are taken at room temperature of 26 °C (78°F); the battery had rested for 24 hours after charge or discharge.

Voltage readings & specific gravity of electrolyte (lead acid batteries) can give an indication of your battery's state of charge.

Fault Finding



- » **Charger won't indicate charging.** »
 - Charger not connected to battery.
 - Check terminal connection.
 - Battery is not 12V.

- » **Battery won't charge.** »
 - Verify that all wiring meets specifications.
 - Check condition of batteries.
 - Check performance of alternator.

» **Battery won't fully charge or hold charge.**

» Batteries that are over 3 years old; severely discharged (or previously been severely discharged); not regularly recharged; over-heated; low in electrolyte; undercharged; overcharged or sulphated may not accept or hold a charge. A good automotive store or battery outlet often offer a free or low cost in store service to check condition of battery. Your battery may require replacement.

Support

For the use of this manual and the conditions or methods of installation, operation, use, and maintenance of photovoltaic (PV) product are beyond ECO-WORTHY's control, **ECO-WORTHY** does not accept responsibility and expressly disclaims liability for any loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance.

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ECO-WORTHY reserves the right to change the manual, the PV products, the specifications, or product information sheets without prior notice.

This product is covered by a 1 year warranty provided by **ECO-WORTHY** Ltd. We will refund or partial refund or replace any products with defects due to our imprudence.

If you are experiencing technical problems and cannot find a solution in this manual, please contact **ECO-WORTHY** for further assistance.

Contact number:

US: 1-866 939 8222

UK: +44 20 7570 0328

GE: +49 693 1090 113

Email:

customer.service@eco-worthy.com