ECO-WORTHY

Version: 1.1.1

Charger

20A DC-DC MANUAL

BATTERY CHARGER



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(DE)

·Web://www.eco-worthy.com/

·E-mail: customer.service@eco-worthy.com

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I. General Information

This DC-to-DC battery charger is specifically designed for 12V batteries, including lead-acid, AGM/GEL, calcium, and lithium iron phosphate batteries. It supports mode switching and fully automatic control, featuring a hybrid charging mode and a solar-only charging mode, with an external switch for easy use and connection.

1. Safety Instructions

Please read this manual carefully before using the product to prevent damage and injury. This product is intended only for charging 12V deep-cycle batteries in vehicles and RVs. Do not use it for charging dry cell batteries.

* Keep the charger away from flames or explosives.
* Do not smoke near the charger.
* Do not place any objects on the charger to prevent short circuits or fires.
* Perform charging and testing in a dry, well-ventilated indoor area.

2. Product Features

* Solid aluminum casing and mounting bracket for durability.
* Microchip monitoring and control for precision.
* High-frequency automatic charging for efficiency.
* Internal temperature and output control for safety.
* Designed with multiple protection features for reliability.
* External switch for remote control convenience.

3. Key Indicator Symbols

Symbols	Definition
	Indicates the danger of electric shock. If not avoided, it would cause casualities.
	Indicates a potentially dangerous condition which could result in injury or death.
	Indicates important information or warnings related to concepts talked about in the text.
	Indicates more information is available in other documents relating to the subject and reader.
	Indicates important steps or tips for optimal performance.

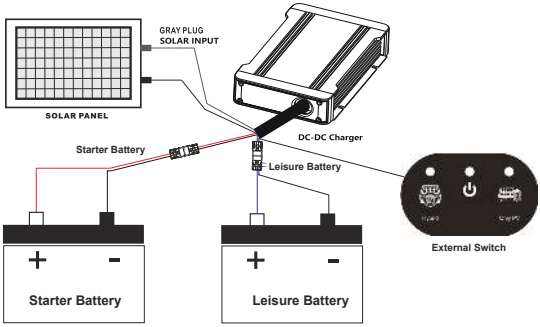
II. Packing List

Name	Picture	Specification	Qty
DC-DC Charger		12V 20A	1
External Switch			1
External Switch Mounting Base			1
Anderson Connector		50A	2

III. Installation

1. Connection

The charger extension cable typically comes with MC4 connectors and Anderson connectors (50A 600V). If you wish to extend the extension cable, please refer to the specifications table later in the document for more information and to ensure the specifications are correct.



1. Securely mount the charger with the provided screws. It can be installed either vertically or horizontally.
2. Measure the length of the extension cable from the controller to the starter battery and the leisure battery before installation.
3. Connect the solar panel to the charger with the MC4 connectors, and ensure that the positive and negative poles are correctly identified to prevent reverse connection.
4.Connect the Anderson connector labeled with "Starter Battery" to the starter battery (if you need additional extension cables, you will have to purchase them separately. We will provide Anderson connectors for the extension cables).
5.Connect the Anderson connector labeled with "Leisure Battery" to the leisure battery (if you need additional extension cables, you will have to purchase them separately, and we will provide Anderson connectors for your use). It is recommended to install a 25A circuit breaker(to be purchased separately) on the positive terminal of the leisure battery to ensure safety.
6. Connect the external switch with the 5m external switch connection cable that comes with the charger. After confirming the location of the external switch, you can fix it in place with the external switch mounting base.

IV. Features and Operation

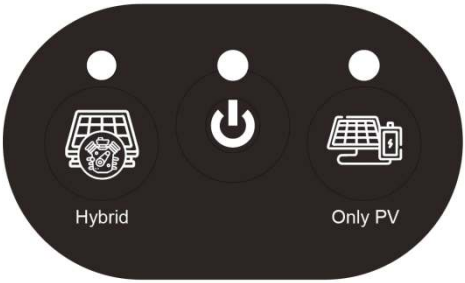
1.Explanation of Indicator Lights on the Device



Name	Explanation	Indicator Light Status	Product Status
Power On(BLUE)	Power Indicator Light	Off	Device Off
		Steady Blue	Device On
Fully Charged(BLUE)	Charge Complete Indicator Light	Blue Flashing	Battery Fully Charged
Hybrid (BLUE)	Hybrid Mode Indicator Light	Steady Blue	Currently in Hybrid Mode, Battery Fully Charged or No Battery Connected
		Blue Flashing	Currently in Hybrid Mode, the Battery is Charging
Only PV (BLUE)	Solar-Only Mode Indicator Light	Steady Blue	Currently in Solar-Only Mode, Battery Fully Charged or No Battery Connected
		Blue Slow Flashing	Currently in Solar-Only Mode,the Battery is Charging
		Blue Fast Flashing	Currently in Solar-Only Mode, the Solar Power is Too Low
Lead Acid(BLUE)	General Lead-Acid Battery Charging Mode	Steady Blue	In Lead Acid Mode
AGM/Gel(BLUE)	AGM and Gel-Type Lead-Acid Battery Charging Mode	Steady Blue	In AGM/Gel Mode
Calcium(BLUE)	Calcium Battery Charging Mode	Steady Blue	In Calcium Mode
LiON(BLUE)	Lithium Battery Charging Mode	Steady Blue	In LiON Mode
Battery Type Selector	Battery Type Selection Button	/	/

2. External Switch Panel Description

①The device defaults to Hybrid mode when powered on.
②When unloaded, short press to switch to the corresponding charging mode.
③When loaded, long press to switch to the corresponding charging mode.



Name	Explanation	Button operation	Indicator state	Product Status
	Power Indicator Light (Blue)	Long press	Off	Device Off
		Long press	Steady Blue	Device On
	Hybrid Mode Indicator Light (Blue)	Short press/ Long press	Steady Blue	Currently in Hybrid Mode, Battery Fully Charged or No Battery Connected
			Blue Slow Flashing	Currently in Hybrid Mode, the Battery is Charging
	Solar-Only Mode Indicator Light (Blue)	Short press/ Long press	Steady Blue	Currently in Hybrid Mode, Battery Fully Charged or No Battery Connected
			Blue Slow Flashing	Currently in Solar-Only Mode, the Battery is Charging
			Blue Fast Flashing	Currently in Solar-Only Mode, Solar Power Too Low

3.Power-On and Power-Off Voltage

DC Power Supply

DC Input Voltage	0-12.5V±0.2V	Higher than 13.0V±0.2V	Less than 13.3V±0.3V
Product working state	Off	On	The current will drop

PV Power supply

Solar Input Voltage	0-10V±0.5V	Higher than 16V±0.5V	Higher than 18.2V±0.5V	10.5V-18.2V
Product working state	Off	On	100% Current	Automatic Current Adjustment

Description:

1.When the solar input voltage is above 18.5V, it is the maximum output current. The output charging current will automatically decrease when the solar power drops. Conversely, the output current will automatically increase when the solar power rises.

2.In hybrid mode, when both DC and solar input meet the power-on conditions, the product automatically prioritizes solar input for power supply.

3.In hybrid mode, when the solar charging current is below 16A, DC input will intervene, allowing both DC and solar to input simultaneously to achieve a complementary effect, providing maximum power for output.

Note:

The voltages described above are measured across the terminals of the DC-DC product. Due to the issues of voltage drop caused by the connecting wires, the voltage at the DC-DC product's terminals during operation may be lower than that of the battery terminals. The longer or thinner the connecting wires, the greater the voltage difference. Following the wire specifications required by the manual can reduce the impact of voltage drop issues.

4. Usage Steps

1) Standby

Connect both DC INPUT and PV INPUT, and long press the power button on the external switch panel. The button will light up with a steady blue backlight. When there is no output connected, if you select Hybrid mode, the Hybrid blue indicator lights on both the device body panel and the external switch panel will remain on. If you select Solar-Only mode, the Only PV blue indicator lights on both the device body panel and the external switch panel will remain on. (The default mode upon initial connection is Hybrid mode)

2) Battery Type Selection
After the charger is turned on, it defaults to Lead Acid mode for charging (with a full charge voltage of 14.4V), and the Lead Acid indicator light will be on. You can press the Battery Type Selector to select the charging mode according to the type of battery. When the output is connected to a battery, the POWER button will need to be long pressed for 3S to make another selection.

3) Charging Mode Selection
By tapping the corresponding charging mode button, you will select that specific charging mode, and the corresponding button's blue backlight will light up.

5. Lithium Battery Activation

When a lithium battery is in a protection state, this product will not be able to provide charging. In this case, you need to switch the product to LiON mode, correctly connect the battery's positive and negative terminals to the output, and long press the POWER button for 5S. After the Charging (BLUE) indicator light flashes for 10S, if the activation is successful, the Charging (BLUE) indicator light will remain on, and the product will automatically switch to normal charging; otherwise, it will return to the standby interface.

Note:

1. If the charger and battery are connected in reverse, the charger will not output, and the buzzer will emit an alarm sound.
2. When the product's heatsink temperature reaches 75℃, the product will automatically reduce the output current to protect against overheating damage.
3. After selecting the battery type during use, as long as you do not press the POWER button, the charger will automatically enter the battery type selected in the previous setup.
4. When there is only DC input, after the photovoltaic (PV) system is engaged, the reaction time for solar input to supplement the current is more than 30S.
5. When powered by the starter battery, if the starter battery voltage is below 13V, the device will not power on, and the power indicator light will flash once when the power button is long pressed.

V. Specification

Product	
Model	ECO-DCDC1220
Input	Battery input: 12.4V~16.0V
	Solar input: 16.0V~25.0V
Charging Voltage	14.4-15.4V
Output Current	DC output: 20A
	Solar output: 20A
Minimum Start Voltage	2.0V
Charging	
Soft Start	Yes
Soft Charging Current	20A
Bulk Charging Voltage	AGM/Gel battery: 14.7V
	Lead Acid battery: 14.4V
	Calcium battery: 15.4V
	LiFePO4 battery: 14.4V
Absorption	Constant voltage with automatic amperage control
Equalization	Automatic
Float Charging Voltage	AGM/Gel battery: 13.5V
	Lead Acid battery: 13.5V
	Calcium battery: 13.5V
Float Charging Current	100mA
Battery Range	120Ah~1200Ah
Cable	
0~1m	10AWG
1~5m	8AWG
5m+	6AWG

VI. Troubleshooting

Fault	Reasons & Solution
Charger is not working	1. No battery is connected; 2. Battery is not 12V; 3. Check all the wiring.
Charger is beeping	1. Connection may be reversed. 2. Reconnect the battery correctly.
Battery cannot be charged	1. Check all the wiring; 2. Check car and solar panel input; 3. Check the battery status.
Battery cannot be fully charged	1. Battery is too old or possibly faulty. 2. Check its SOH and a replacement might be needed.

VII. Technical Support

1) Customer service telephone numbers:

Tel(DE): +49 693-1090-113

Tel(US): 1-866-939-8222

Tel(UK): +44 20 7570 0328

Note:

Customer Service Hours:

US: Mon-Fri 8:30 AM - 6:00 PM (CST)

UK: Mon-Fri 9 AM - 5 PM(GMT)

DE: Mon-Fri 9 AM - 5 PM(CET)

If you cannot get through by phone, please send us an email.

2) Company address: USA/Germany

Address(US): 4411 East State Hwy D Suite C Springfield, Missouri 65809

Address(DE): ECO-Worthy Europe GmbH Otto-Hahn-Str. 20 61381 Friedrichsdorf - Köppern Germany

3) Customer service email:

E-mail:customer. service@eco-worthy.com

4) Official website address:

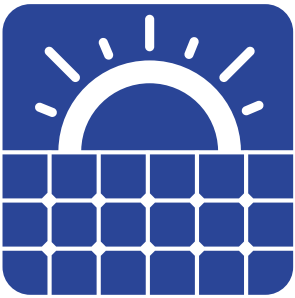
Web: https://www.eco-worthy.com/

5) Official social media:

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