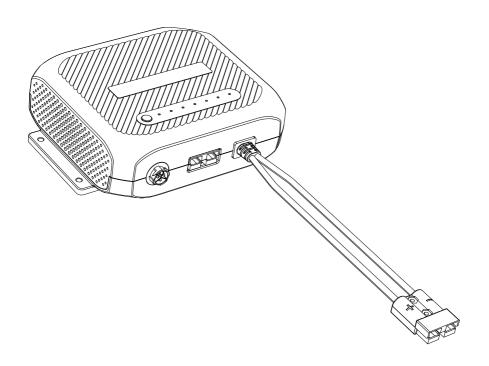
D40 DC-DC Battery Charger

User Manual v2.0

Please read this manual carefully before use and keep it for future reference.





Thank You!

Thank you for making BLUETTI a part of your family.

From the very beginning, BLUETTI has tried to stay true to a sustainable future through green energy storage solutions while delivering an exceptional eco-friendly experience for our homes and our world.

That's why BLUETTI makes its presence in 100+ countries and is trusted by millions of customers across the globe.



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If you have any questions or concerns about this manual, please contact BLUETTI support for further assistance.

About the Manual

Introduction

This manual provides information on the functionality, basic operation and safety instructions of the D40 DC-DC Battery Charger ((hereinafter referred to as D40). Please read and understand all instructions in this manual before use.

Symbol Conventions

This manual uses the following symbols to highlight important information:

Symbol	Category	Description
<u>^</u>	Danger / Attention	It indicates a hazardous situation which, if not avoided, could result in death or serious injury.
Ţ <u>i</u>	Notice	It indicates a potentially hazardous situation which, if not avoided, could cause substantial damage to property and the environment.

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1. Safety Instructions

This manual contains important safety and operating instructions for D40 battery charger. Before using battery charger, read all instructions and cautionary markings on battery charger, battery, and product using battery.

1.1. Statement

To ensure a safe operation, it's crucial to observe and adhere to the following conditions:

- Always operate or store the product in the conditions specified in this manual.
- The installation and ambient conditions must comply with all applicable codes and regulations.
- Avoid unauthorized disassembly, component replacement, or modification of software codes.

BLUETTI shall not be liable for damages resulting from the following circumstances:

- Force majeure events such as earthquakes, fires, storms, floods, or mudslides.
- Damage caused by the customer's own transportation.
- Damage resulting from inadequate storage conditions as specified in the manual.
- Damage caused by customer negligence, improper operation, or intentional actions.
- System or hardware damage caused by third parties or customers, including but not limited to improper handling and installation not in accordance with the instructions in this manual.
- Damage caused by adjustments, changes, or removal of identification labels not in compliance with this manual.
- The product doesn't fulfill power supply needs for power-reliant equipment in critical sectors like atomic energy, aviation, medical, and other domains where safety is paramount. BLUETTI assumes no liability for incidents involving personal safety, fire, equipment malfunction, data loss, or any adverse aftermath resulting from using this product with such equipment.

1.2 General Requirements

- The battery charger is intended to recharge batteries. The battery that is connected to this product is only suitable if it complies with the given battery standard for that battery type and is provided with a battery management system that will monitor and control the electrical and thermal health of the battery during charging. When installing this battery charger, the battery is to be verified as in compliance with the applicable battery standard.
- Always turn off the power source before starting any electrical work.
- Do not clean the product with water.
- Do not disassemble the product on your own.
- Regularly inspect the product and its accessories for damage or deterioration.

- If the product's shell is cracked during transportation or use, do not use it and contact BLUETTI support or your local BLUETTI dealers.
- Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
- Use genuine cables and accessories provided by BLUETTI.
- Keep the product away from heat sources, high temperatures.
- Do not store the product with flammable liquids, gases, or explosive materials.
- Make sure the area where you are using the product is well ventilated and spacious.
- In case of malfunction, turn off the product immediately and contact BLUETTI support or your local BLUETTI dealers if this manual cannot adequately explain the malfunction to you.
- Do not attempt to replace any other component of the product by anyone other than authorized personnel. If such replacements are necessary, seek assistance from qualified technical support personnel.
- Do not use the product in a humid environment, and make sure it's thoroughly dry before use.
- Do not insert foreign objects into any ports and vents of the product.
- Do not put fingers or hands into the product.
- Keep the product out of reach of children and pets.
- To reduce the risk of damage to the electric plug and cord, pull the plug rather than the cord when disconnecting the product.
- The D40 is compatible with LiFePO₄, gel, lead-acid, and calcium batteries. Lead-acid batteries contain corrosive and toxic liquids and can generate flammable and toxic gases during charging or operation, which may cause an explosion. When handling these batteries, wear safety goggles, gloves, or protective clothing, remove personal metal items, and ensure good ventilation in the work area. Follow the battery manufacturer's user manual for safe usage.
- Do not disconnect the cable while the product is in operation. There may still be residual voltage present in certain parts of the product even after disconnection. Wait for at least 5 minutes before performing any further operations.

2. Packing List

Standard Accessories

Item	Picture	Qty.
D40 DC-DC Battery Charger		1
DC Power Cable (For powering D40 from portable power station's RV port)		1
Anderson Connector Accessory		6
Mounting Screws	√unununun €	6
Anderson Connector		1 Gray, 1 Red
Product Documentation	DOM: DOMESTIC COMMITTEE CO	1

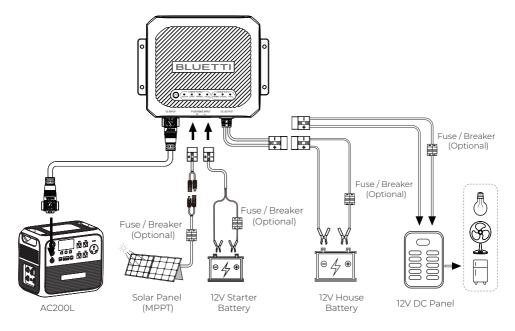
Optional Accessory

(Available on the official BLUETTI website: https://www.bluettipower.com)

Item	Picture
Connection Cable (3m or 5m, for connecting solar panels, starter batteries, and house batteries)	

3. Product Introduction

The D40 is a 400W DC-DC battery charger designed for charging various types of RV house batteries, including LiFePO₄, AGM / gel, lead-acid, and calcium batteries. It's compatible with BLUETTI portable power stations (via the 48V port), solar panels (12V-36V), and starter batteries, providing a comprehensive solution for battery charging needs. Plus, it powers up your 12V RV appliances with BLUETTI portable power stations. When connecting to solar panels and the AC200L simultaneously, the D40 prioritizes solar input if the open-circuit voltage of solar panels is within the range of 13V to 36V. However, if the solar input falls below around 40W, the D40 automatically switches to the AC200L for uninterrupted charging.



Attention:

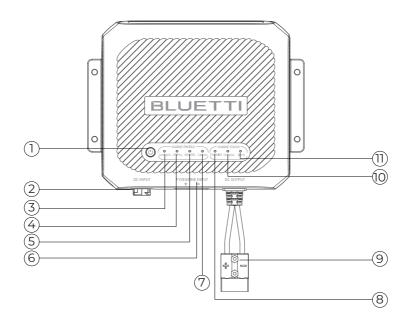
Do not connect any ports of D40 to the grid.

Do not use solar panels that have an open circuit voltage higher than 36V.

(I) Notice:

For safety reasons, it is recommended to install 40A circuit breakers on the PV, starter battery, house battery, and RV appliance sides, as shown in the above figure.

4. Product Overview



No.	ltem	No.	ltem
1)	Power Button	7	Calcium Indicator
2	48V DC Input	8	PV / ENGINE Indicator
3	Lead-acid Indicator	9	DC Output
4	LiFePO ₄ Indicator	10	Charging Indicator
(5)	AGM / GEL Indicator	11)	Alarm Indicator
6	PV / ENGINE Input		

5. Mounting

5.1 Location Requirements

Place the D40 inside the vehicle's cabin or trunk near the house battery. Make sure that the area is not prone to moisture and avoids potential high-temperature conditions. Securely mount the D40 on a stable surface, either horizontally or vertically.

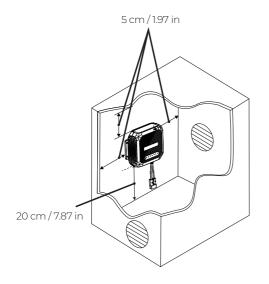
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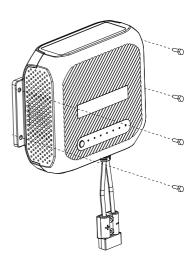
When using the D40 near the lead-acid batteries:

- 1. Ensure proper ventilation.
- 2. Maintain a safe distance between batteries and the D40.
- 3. Follow the battery manufacturer's safety guidelines.

5.2 Mount the D40

- 1. Select an appropriate location. Provide at least 5cm (1.97in) of clearance above, to the left, and to the right of the D40, with a minimum of 20cm (7.87in) clearance below it. **Note:** Adequate ventilation is necessary for D40's optimal performance.
- 2. Place the D40 against the designated spot.
- 3. Secure the D40 in place using 4 self-tapping screws.





6. Applications

6.1 Supported House Batteries

The D40 is compatible with 4 types of batteries:

Battery Type	Specifications		
Lead-acid	Max. Input Voltage: 14.4V Battery Capacity: >100/		
LiFePO ₄	Max. Input Voltage: 14.4V	Battery Capacity: >100Ah	
AGM/gel	Max. Input Voltage: 14.7V	Battery Capacity: >100Ah	
Calcium	Max. Input Voltage: 15.4V	Battery Capacity: >100Ah	

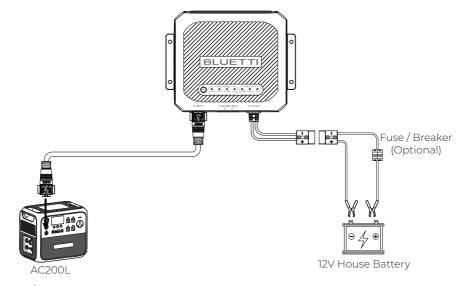
Attention:

Refer to the battery manufacturer's specifications when selecting the appropriate battery type for charging.

6.2 Charge the House Batteries (Battery Mode)

6.2.1 Charge via BLUETTI Portable Power Station

With the D40, you can charge the house battery via BLUETTI portable power station.



Preparation

- Check that the portable station and D40 are in good condition.
- Make sure that the house battery is compatible with the D40.
- Prepare the necessary connection cables and Anderson connector.



DC Power Cable

Wiring & Operations

- 1. Connect the AC200L and D40 via the DC Input Power Cable.
- 2. Turn on the AC200L and activate the DC output; this will automatically activate the D40.
- 3. Select the battery type for charging:
 - a. Press and hold (\circlearrowleft) for more than 3 seconds, and when the CHARGE PROFILE indicator flashes, you can select the battery type.
 - b. Press (\circlearrowleft) to navigate and select the battery type; the corresponding indicator will flash.
 - c. Press and hold (\circlearrowleft) for more than 3 seconds until the flashing indicator becomes steady.
- 4. Connect the D40's DC output to the battery using the Anderson connector, and make sure to match the positive and negative terminals. The Charging indicator will remain lit if the charging is successful.

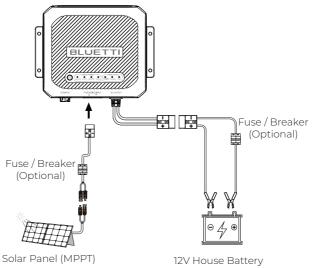
(I) Notice:

- When connecting to power stations like the AC200L, the D40 automatically turns on if the power is on and the DC output is enabled. To avoid this, turn off the AC200L's DC output.
- When charging using BLUETTI portable power stations, you can monitor the charging progress by reviewing the output status shown on the power station's screen.

6.2.2 Charge via Solar Panels

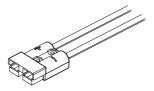
With abundant sunlight, you can utilize high-performance solar panels to charge the house battery.

Note: D40 has MPPT built-in, allowing it to operate efficiently and make the most of the solar energy.



Preparation

- Check that the solar panels and D40 are in good condition, and that the PV input voltage is in the 12V-36V range. The PV input activates automatically when the voltage reaches 13V.
- Make sure that the house battery is compatible with the D40.
- Assemble the necessary connection cables and connectors correctly.



Wiring & Operations

1. Connect the solar panel to the D40 via the Anderson connector (red), ensuring correct polarity.

Make sure that the PV input voltage falls within 12V to 36V. The D40 automatically activates once the voltage reaches 13V.

- 2. Press (**) to navigate until the PV/ENGINE indicator in CHARGE STATUS section flashes.
- 3. Press and hold (\circlearrowleft) for more than 3 seconds until the indicator turns off. Then, press and hold (\circlearrowleft) for another 3 seconds until the indicator becomes steady, indicating the power supply has switched to the PV.
- 4. Press (U) again to navigate the flashing indicator back to the CHARGE PROFILE section.
- 5. Select the battery type for charging:
 - a. Press and hold (\circlearrowleft) for more than 3 seconds, and when the CHARGE PROFILE indicator flashes, you can select the battery type.
 - b. Press (\circlearrowleft) to navigate and select the battery type; the corresponding indicator will flash.
 - c. Press and hold ((U)) for more than 3 seconds until the flashing indicator becomes steady.
- 6. Connect the D40's DC output to the battery using the Anderson connector, and make sure to match the positive and negative terminals. The Charging indicator will remain lit if the charging is successful.

(I) Notice:

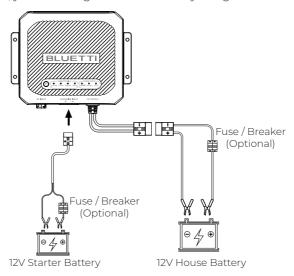
- Make sure that the solar panels have an open-circuit voltage of 13V-36V. The D40 automatically turns on when the input voltage reaches 13V or higher and turns off when the voltage falls below 11.7V.
- When connected to solar panels, the D40 supports a maximum input current of 20A and a maximum output current of 30A.
- When both solar panels and the power station are connected, the D40 prioritizes solar input when the solar input power reaches or exceeds around 40W, smoothly switching to the power station below around 40W.

Attention:

- Do not use solar panels that have an open circuit voltage higher than 36V.
- · Non-waterproof solar panels may experience reduced efficiency if exposed to prolonged rain.

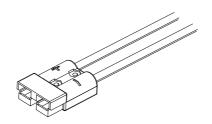
6.2.3 Charge via Starter Battery

Moreover, with the D40, you can charge the house battery using the RV starter battery.



Preparation

- Check that the starter battery has a voltage of 11.7V or higher and that the D40 is in good condition.
- Make sure that the house battery is compatible with the D40.
- Assemble the necessary connection cables and connectors correctly.



Wiring & Operations

- 1. Connect the Anderson connector (red) on the starter battery to the PV/ENGINE input. The D40 will activate when the voltage of the starter battery reaches or exceeds 11.7V.
- 2. Press (U) to navigate until the PV/ENGINE indicator in CHARGE STATUS section flashes.
- 3. Press and hold (\circlearrowleft) for more than 3 seconds until the indicator turns off, indicating the power supply has switched to the starter battery.
- 4. Press (\circlearrowleft) again to navigate the flashing indicator back to the CHARGE PROFILE section.
- 5. Select the battery type for charging:
 - a. Press and hold (\circlearrowleft) for more than 3 seconds, and when the CHARGE PROFILE indicator flashes, you can select the battery type.
 - b. Press (U) to navigate and select the battery type; the corresponding indicator will flash.
 - c. Press and hold (\circlearrowleft) for more than 3 seconds until the flashing indicator becomes steady.
- 6. Connect the D40's DC output to the battery using the Anderson connector, and make sure to match the positive and negative terminals. The Charging indicator will remain lit if the charging is successful.

6.3 Replace the House Battery

6.3.1 Preparation

Make sure that the replacement battery is compatible with the D40.

6.3.2 Replacement

- 1. Press and hold (\circlearrowleft) for more than 3 seconds until the battery type indicator starts flashing. Charging stops.
- 2. Disconnect the battery from the D40.
- 3. Connect the replacement battery to the D40's DC output.
- 4. Press (也) to navigate and select the new battery type. The corresponding indicator flashes.
- 5. Press and hold (\circlearrowleft) for more than 3 seconds until the flashing indicator becomes steady. The Charging indicator will remain lit if the charging is successful.

6.4 Pause / Resume Charging

Pause charging

Press and hold (\circlearrowleft) for more than 3 seconds until the battery type indicator starts flashing. Charging stops. If no further action is taken within 1 minute, the flashing indicator goes off, leaving the power indicator on.

Note: To turn off all indicators, unplug all inputs. When using PV or starter battery as the input source and the battery is charged, additionally press and hold (\circlearrowleft) for more than 3 seconds.

· Resume charging

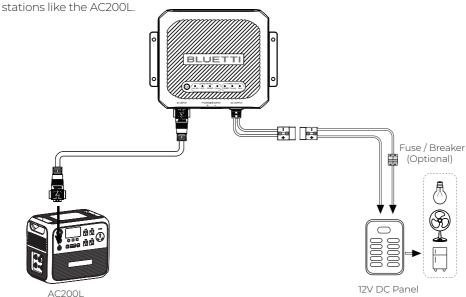
Press and hold (U) for more than 3 seconds, the D40 will resume charging using the previously selected battery type and charging mode.

Attention:

Match the selected battery type with the one being charged. BLUETTI shall not be liable for any damages resulting from incorrect selections.

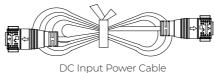
6.5 Power RV Appliances (Load Mode)

With the D40, you can also power your RV appliances via BLUETTI portable power



Preparation

- Check that the portable station and D40 are in good condition.
- Prepare the necessary connection cables and Anderson connector.



Wiring & Operations

- 1. Connect the AC200L and D40 via the DC Power Cable.
- 2. Connect the RV appliances to the D40's DC output, and make sure to match the positive and negative terminals.
- 3. Turn on the AC200L and activate the DC output; this will automatically activate the D40.
- 4. Enable the Load Mode:
 - a. Press and hold (\circlearrowleft) for more than 3 seconds until the CHARGE PROFILE indicator flashes.
 - b. Press (ひ) to navigate until all indicators flash.
 - c. Press and hold (\circlearrowleft) for more than 3 seconds until the flashing indicators become steady, indicating the Load Mode is enabled.

The Charging indicator will remain lit when the RV appliances are successfully powered.

(I) Notice:

- When connecting to power stations like the AC200L, the D40 automatically turns on if the power is on and the DC output is enabled. To avoid this, turn off the AC200L's DC output.
- When charging using BLUETTI portable power stations, you can monitor the charging progress by reviewing the output status shown on the power station's screen.
- In this mode, the D40 produces 12V DC output.

↑ Attention:

- Before powering on, make sure that the RV appliances are connected with the correct polarity.
- The PV / ENGINE input is unavailable.

7. Specifications

Model		D40		
Charging Power		400 W		
Weight		Approx. 2 kg / 4.4 lbs		
Dimension	s (L × W × H)	232.7 mm × 180.7 mm × 69.2 mm / 9.2 in × 7.1 in × 2.7 in		
Working Te	emperature	-20°C to 45°C / -4°F to 113°F		
Storage Te	emperature	-20°C to 50°C / -4°F to 122°F		
Working	Humidity	10% to 90%		
No	oise	43 dB Max.		
Working	g Altitude	Up to 2,000 m / 6,561 ft		
Protecti	on Grade	IP20		
		DC Output		
Cur	rent	30A Max. (Connected to solar panel) 20A Max. (Connected to AC200L)		
	14.4V Max.	When a Lead-acid battery is connected to the output , and set to the Lead-acid mode		
	14.4V Max.	When a LiFePO $_4$ battery is connected to the output , and set to the LiFePO $_4$ mode		
Voltage	14.7V Max.	When a AGM / gel battery is connected to the output , and set to the AGM / gel mode		
	15.4V Max.	When a Calcium battery is connected to the output , and set to the Calcium mode		
DC Input				
48V DC	(AC200L)	45V to 60VDC		
PV / 12V Starter Battery		12V to 36VDC, 20A Max.		

8. Indicator Instructions

Indicator	Function	Explanation
<u> </u>	Display power supply status	It lights up when the 48V DC input voltage exceeds 36V or the PV/ENGINE input voltage exceeds 12V, indicating that the D40 is in standby mode; otherwise, it remains off.
Lead Acid	/	It lights up when charging a lead-acid house battery.
LiFePO ₄	/	It lights up when charging a LiFePO ₄ house battery.
AGM/GEL	/	It lights up when charging an AGM / gel house battery.
Calcium	/	It lights up when charging a calcium house battery.
Lead Acid + LiFePO ₄ + AGM/GEL + Calcium	Powering the RV appliances	/
PV/ENGINE	/	On: charge via solar panels On & then off: charge via starter battery
Charging	Charging status indicator	It lights up when the house battery is charging and blinks slowly (@ approx. 1.0Hz) when fully charged.
Alarm	Alarm indicator	It lights up when there is a malfunction. Please refer to Chapter 9. Troubleshooting for details.

9. Troubleshooting

Battery Mode

Fault	Symptom	Reason	Solution
Reverse Polarity Protection (Input)	All indicators off.	The polarity of your PV/ENGINE INPUT is reversed.	1. Check that the Anderson connector is connected to the PV/ENGINE INPUT terminal with the correct polarity. 2. Fix the connections, and check if the D40 functions properly. If the symptom persists, please contact BLUETTI support for assistance.
Reverse Polarity Protection (Output) / Output Undervoltage Protection / RV House Battery Connection Abnormal	Alarm indicator on; Charging indicator blinks slowly (@ approx. 1.5Hz).	The polarity of DC OUTPUT is reversed; D40's output voltage is below 9V; RV house battery is not connected properly.	1. Check that the Anderson connector is connected to the DC OUTPUT terminal with the correct polarity. 2. Fix the connections, and check if the D40 functions properly. 3. Make sure the D40 provides an output voltage above 9V. If the symptom persists, please contact BLUETTI support for assistance.

Fault	Symptom	Reason	Solution
Input Overvoltage	Charging indicator off; Alarm indicator blinks rapidly (@ approx. 3Hz).	The voltage on PV/ENGINE INPUT exceeds 38V, which may cause equipment damage.	1. Unplug the cable from the PV/ENGINE INPUT port. 2. Check the unit for damage, if damaged, replace with a new unit. 3. Make sure the voltage on the PV / ENGINE INPUT port falls within 12V-36V. 4. Reestablish the connection and check if the D40 works properly. If the symptom persists, please contact BLUETTI support for assistance.
Battery Overvoltage Protection	Charging indicator off; Alarm indicator on; Battery indicator blinks slowly (@ approx. 3Hz).	The battery voltage exceeds the maximum input voltage by 0.4V.	Check the battery voltage. If the voltage difference exceeds 0.4V, replace the battery and attempt charging again. If charging is still unsuccessful, please contact BLUETTI support for assistance. If the voltage is below 0.4V, please also contact BLUETTI support for assistance.
Temperature Protection	Charging indicator off; Alarm indicator blinks slowly (@ approx. 1.5Hz).	When the unit's temperature reaches 70°C / 158°F, the fan automatically activates; when it reaches 102°C / 215.6°F or if the temperature falls below 0°C / 32°F when charging with a LiFePO ₄ battery, the temperature protection will be triggered.	1. Wait for 5 minutes. If the D40 resumes operation after cooling down, it suggests inadequate ventilation in the current location. 2. Power off the D40 and any related devices. 3. Disconnect all cables and remove the D40. 4. Move the D40 to a suitable location. If the symptom persists, please contact BLUETTI support for assistance.
LiFePO ₄ BMS Protection	Charging indicator off; Alarm indicator on; LiFePO ₄ indicator blinks rapidly (@ approx. 1.5Hz).	The voltage of LiFePO ₄ battery drops suddenly. D40 will stop charging	1. Check the LiFePO ₄ battery and connections for any abnormalities. Replace the battery and fix the connections. 2. Press (①) to restore the output. If the symptom persists, please contact BLUETTI support for assistance.
Software and Hardware Overcurrent	Alarm indicator steady	/	1. If charging doesn't resume within 1 minute, restart the unit. 2. If the symptom persists, please contact BLUETTI support for assistance.

Load Mode

Fault	Symptom	Reason	Solution
Output Overvoltage Protection	Charging indicator off; Alarm indicator on; Battery indicator blinks slowly (@ approx. 3Hz).	/	Restart the unit. If the symptom persists, please contact BLUETTI support for assistance.
Temperature Protection	Charging indicator off; Alarm indicator blinks slowly (@ approx. 1.5Hz).	When the unit's temperature reaches 70°C / 158°F, the fan automatically activates; when it reaches 102°C / 215.6°F, the temperature protection will be triggered.	1. Wait for 5 minutes. If the D40 resumes operation after cooling down, it suggests inadequate ventilation in the current location. 2. Power off the D40 and any related devices. 3. Disconnect all cables and remove the D40. 4. Move the D40 to a suitable location. If the symptom persists, please contact BLUETTI support for assistance.
Battery Connection Protection	Charging indicator blinks slowly (@ approx. 1.0Hz).	/	Please check whether the output connection is a battery, if so, please replace it with a load connection in time.
Reverse Polarity Protection (Output) / Overcurrent Protection	Alarm indicator steady	/	1. Reduce the load if necessary. 2. Check that the Anderson connector is connected to the DC OUTPUT terminal with the correct polarity. 3. Fix the connections, and check if the D40 functions properly. 4. Restart the unit. If the symptom persists, please contact BLUETTI support for assistance.

Appx. 1 FAQ

- Q1: Tips for maintaining the D40 DC-DC battery charger:
- **A:** To keep the D40 charger in good condition:
 - a. Regularly inspect the connections.
 - b. Keep it clean and dry.
 - c. Ensure proper ventilation.
- Q2: What kind of solar panels are compatible with the D40 charger?
- **A:** Before connecting the solar panels, please make sure they meet the following requirements:
 - a. Open circuit voltage: 13V-36V
 - b. Equipped with an MC4 connector. If the solar panel comes with an Anderson connector, please prepare an Anderson to MC4 cable.

Note: The actual charging power may vary depending on factors such as weather conditions, solar availability, and the orientation of the solar panels.

Appx. 2 Abbreviations

- DC: Direct Current
- PV: Photovoltaic
- BMS: Battery Management System

Appx. 3 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- -Reorient or relocate the receiving antenna.
- —Increase the separation between the equipment and receiver.
- —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- —Consult the dealer or an experienced radio/TV technician for help.

Appx. 4 IC Caution

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

RF exposure statement: The equipment complies with IC Radiation exposure limits set forth for uncontrolled environments. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

CAN ICES-3 (B)/NMB-3(B) (Canada)

This Class B digital apparatus complies with Canadian ICES-003.