Product User Manual

30 A / 60 A / 100 A DC-DC Vehicle Charger

Applicable Versions: 50 V / 75 V (refer to the product nameplate for the actual version)

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English Instructions

1. Product Overview

This product uses a four-switch synchronous-rectification buck-boost topology, enabling DC/DC conversion when the input voltage is above, below, or close to the output voltage, with seamless transitions between operating modes. Current-mode control and high-side current sensing support dual-battery charging in vehicles, solar input, and charging of batteries and supercapacitors.

Main Specifications

Model	Starter Battery	Auxiliary Battery	Rated Power	Output Current (Maximum)
30A	12V	12V	375W	30A
		24V	375W	15A
		48V	375W	7.5A
	24V	12V	375W	30A
		24V	450w	15A
		48V	450w	7.5A
	48V	12V	375W	30A
		24V	450w	15A
		48V	450w	7.5A

Model	Starter Battery	Auxiliary Battery	Rated Power	Output Current (Maximum)
60A	12V	12V	750 W	60A
		24V	750 W	30A
		48V	750 W	15A
	24V	12V	900 W	60A
		24V	900 W	30A
		48V	900 W	15A
	48V	12V	900W	60A
		24V	900W	30A
		48V	900W	15A
Model	**Starter Battery**	**Auxiliary Battery**	**Rated Power**	**Output Current (Maximum)**
100A	12V	12V	1250W	100A
		24V	1250W	50A
		48V	1250W	25A
	24V	12V	1250W	100A
		24V	1500W	50A
		48V	1500W	25A
	48V	12V	1250W	100A
		24V	1500W	50A
		48V	1500W	25A

Specifications	50V	75V
Input Voltage Range	9 ~ 50 VDC	9 ~ 75 VDC
Output Voltage Range	3 ~ 50 VDC	3 ~ 75 VDC
UV / OV Set Range	9 ~ 50 VDC	9 ~ 75 VDC
Solar Voltage Set Range	9 ~ 50 VDC	9 ~ 75 VDC
Start Delay	5–999 s	5–999 s
Thermal Protection	Fan: ON 45°C / OFF ≤40°C; shutdown 90°C / recover ≤60°C	Fan: ON 45°C / OFF ≤40°C; shutdown 90°C / recover ≤60°C
Operating / Storage Temp.	-30 ~ 85℃ / -40 ~ 105℃*	-30 ~ 85℃ / -40 ~ 105℃*

2. Wiring Diagram

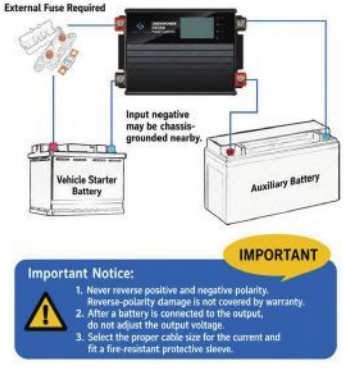

Figure 2-1 Basic Wiring (add protective fuses as specified below)

IMPORTANT Install a correctly rated DC fuse or circuit breaker on both the positive starter-battery lead and positive auxiliary-battery lead, as close to each battery as practical. Select fuse ratings, cable sizes, terminals, and maximum cable lengths for the

3. Initial Installation

DANGER Disconnect all power before wiring and verify the input/output terminals and polarity. Reversing either port may permanently damage the unit, overheat the wiring, or cause a fire.

1. Verify the nameplate, voltage version, and terminal markings. Keep the auxiliary battery disconnected from the output.
2. Connect the input first: starter-battery positive to input positive, and starter-battery negative to input negative. Chassis grounding must comply with the vehicle and product wiring requirements. Use a dedicated negative cable for high-current applications.
3. Confirm that the starter-battery voltage meets the startup requirement. For initial startup on a 12 V system, the voltage should be above 12 V. If it is too low, inspect the battery instead of repeatedly starting the vehicle as a substitute for troubleshooting.
4. Apply input power. The unit enters the start-delay screen with a default 60-second countdown. When the countdown ends, the main screen appears and output begins.
5. With the auxiliary battery disconnected, press and hold Set for 3 seconds to open the settings screen. Set the output, start, and shutdown voltages. For a 12 V starter battery, the default shutdown/start values are 12 V/13 V. For a 24 V system, 24 V/26 V may be used as a reference; final values must match the vehicle charging system.
6. Return to the main screen and wait for the actual output voltage to stabilize at the set value. After verification, disconnect input power.
7. Connect the auxiliary battery: output positive to battery positive and output negative to battery negative. Recheck all polarity, terminal tightness, and safety provisions.
8. Power on the unit. An output-current reading with no fault indication confirms normal operation.

PROHIBITED Never adjust the output voltage while a battery, supercapacitor, or other capacitive load is connected. Stop the unit and disconnect the output load before changing the output voltage.

4. Display Interface and Keys

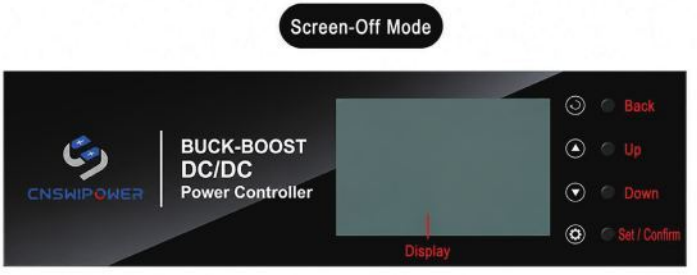

Figure 4-1 Screen-Off Mode and Keys

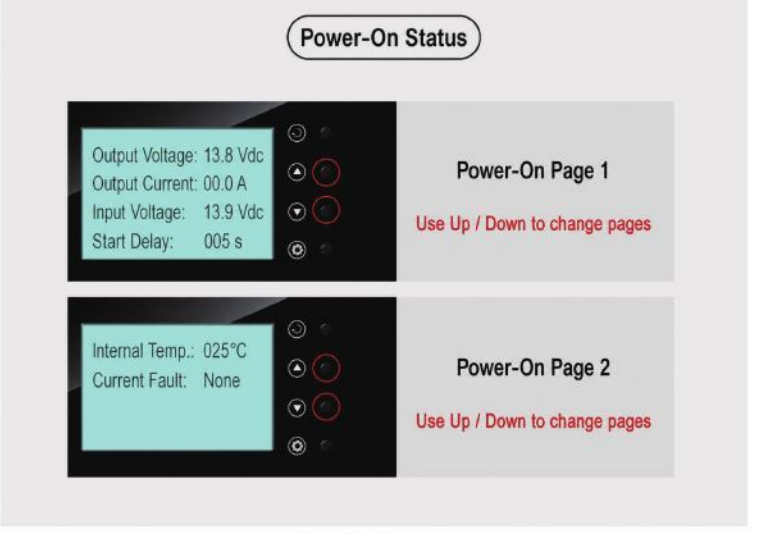

Figure 4-2 Main Screen

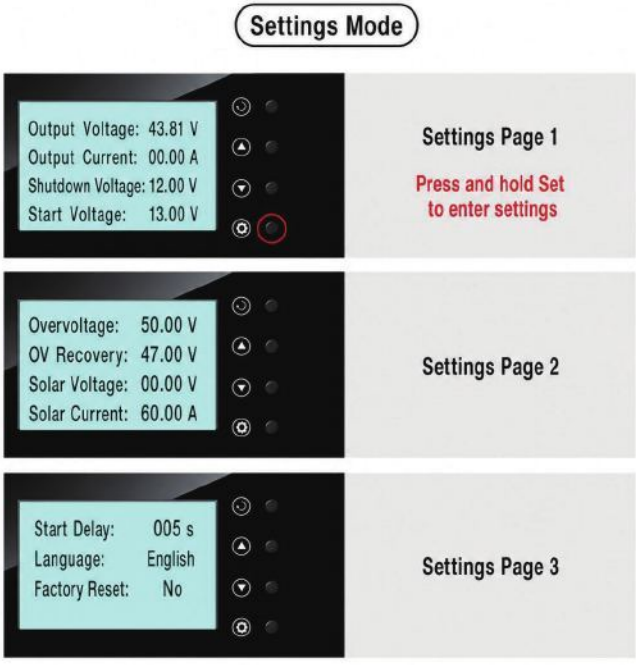

Figure 4-3 Settings Screens

☒ Key Functions

☒ Keys from top to bottom: Back, Up, Down, and Set/Confirm. Press and hold Up or Down for 1 second to change values quickly.

☒ The main screen shows output voltage, output current, input voltage, start delay, internal temperature, and fault status. The backlight turns off automatically after 15 seconds of inactivity.

☒ On the main screen, press and hold Set for 3 seconds to open the settings screen, or hold Back for 3 seconds to view version information. When the input voltage is low, hold Set for 3 seconds to force-start the charger for status checks.

☒ Press Confirm to save every parameter change. Saving takes several seconds; do not disconnect input power during this process.

Key Parameter Descriptions

☒ Output Voltage: Set only when no battery, supercapacitor, or other capacitive load is connected to the output.

☒ Maximum Current: Actual charging current is limited by input current, output current, maximum power, input voltage, output voltage, and temperature.

☒ Shutdown Voltage: This is the input voltage below which the unit shuts down. It must be lower than the start voltage with sufficient hysteresis to prevent repeated cycling.

☒ Start Voltage: This is the input voltage at which the unit turns on. It must be higher than the shutdown voltage with sufficient hysteresis to ensure reliable startup.

☒ Overvoltage / Recovery Voltage: The recovery setting must be lower than the overvoltage-protection setting. Protection cannot prevent damage if the input exceeds the unit's absolute maximum rating.

☒ Solar Voltage: This function is currently unavailable.

☒ Solar Current: This function is currently unavailable.

☒ Start Delay: Adjustable from 5 to 999 s (default 60 s). The delay protects the starter battery by keeping the charger inactive during the high-current engine-start event. Charging begins after the engine has started and the alternator is operating. Adjust the delay as required.

☒ Language: Supports Chinese and English.

☒ Factory Reset: Restores the factory defaults and automatically returns to the main screen.

5. Cables and Protection Devices

Cable Examples	Recommended Current
12 AWG / 4 mm²	Below 25 A
10 AWG / 8 mm²	20 ~ 35 A
8 AWG / 12 mm²	30 ~ 50 A
6 AWG / 16 mm²	60 ~ 100 A
4 AWG / 25 mm²	100 ~ 160 A

NOTE Do not select cable size by current alone. Also consider cable length, ambient temperature, bundling, terminal capacity, and allowable voltage drop.

Input and output currents are not equal. Estimate using Power = Voltage × Current and allow for conversion losses. For example, at 29.2 V and 20 A output, output power is 584 W. Assuming 10% loss, input current is about 49.4 A at 13 V or 53.5 A at 12 V. Always include a safety margin when selecting cable size.

6. Battery Charging Parameters

IMPORTANT The voltages below are common upper-limit references only and are not universal settings. Final charge voltage, current, low-temperature limits, and charging stages must follow the battery manufacturer's and BMS requirements.

Battery Type	Cells / System	Nominal Voltage	Recommended Charge Voltage	Notes
Lead-Acid	1S / 12 V	12 V	14.6 V	Per BMS/cell spec.; 50 V/75 V versions
	2S / 24 V	24 V	29.2 V	Per BMS/cell spec.; 50 V/75 V versions
	3S / 36 V	36 V	43.8 V	Per BMS/cell spec.; 50 V/75 V versions
	4S / 48 V	48 V	58.4 V	Per BMS/cell spec.; 75 V version
	5S / 60 V	60 V	73.0 V	Per BMS/cell spec.; 75 V version
LiFePO4	4S / 12.8V	12.8V	14.6 V	Per BMS/cell spec.; 50 V/75 V versions
	8S / 25.6V	25.6V	29.2V	Per BMS/cell spec.; 50 V/75 V versions
	12S / 38.4V	38.4V	43.8V	Per BMS/cell spec.; 50 V/75 V versions
	16S / 51.2V	51.2V	58.4V	Per BMS/cell spec.; 75 V version
	20S / 60V	60V	73V	Per BMS/cell spec.; 75 V version
Li-Polymer / NMC	4S / 14.8V	14.8V	16.8V	Per BMS/cell spec.; 50 V/75 V versions
	7S / 25.9V	25.9V	29.4V	Per BMS/cell spec.; 50 V/75 V versions
	10S /37V	37V	42V	Per BMS/cell spec.; 50 V/75 V versions
	14S /51.8V	51.8V	58.8V	Per BMS/cell spec.; 75 V version
	17S /62.9V	62.9V	71.4V	Per BMS/cell spec.; 75 V version

Recommended charging current must follow the cell's permitted C-rate. Lead-acid at 0.2C, LiFePO4 at 0.3C, and NMC at 0.5C are estimates only and do not replace the battery datasheet. Ideal charging time is approximately Capacity ÷ Charging Current; actual time also depends on the constant-voltage stage, temperature, and losses.

7. Special Safety Precautions

1. Never reverse the positive and negative polarity at the input or output.
2. Never exceed the rated voltage, current, or power. Do not interchange the 50 V and 75 V versions.
3. When no battery is connected to the output, do not directly connect inductive or high-inrush loads such as motors, pumps, inverters, or parking air conditioners.
4. The test power source must provide adequate power and stability. Use only a load-test method approved by the manufacturer.
5. Circuits above 40 VDC must use correctly rated switches, circuit breakers, or touch-safe connectors. Perform all wiring with power disconnected.
6. Parallel operation is permitted only under the manufacturer's approved scheme. Do not parallel units until current sharing, maximum quantity, and fuse configuration are defined.
7. Install the unit in a ventilated, dry location protected from water, moisture, dust, and insects. Regularly check terminals and cables for abnormal temperature rise.
8. Do not disassemble the unit. Service and warranty terms are governed by the sales contract and applicable local laws and regulations.