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1.Product Description

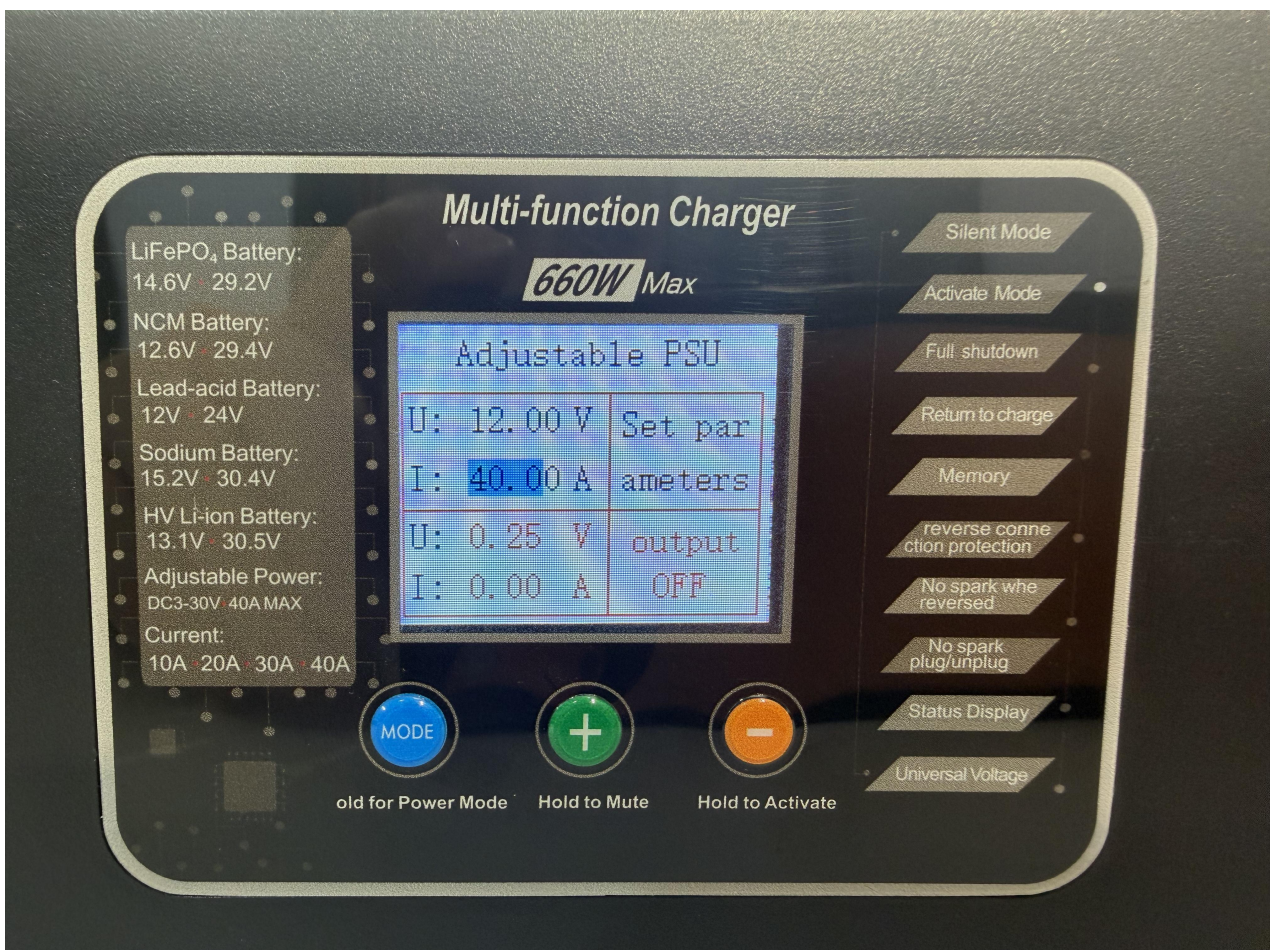
This multi-functional battery pack charger (model: 600D-30V40A) is a high-performance charging device that integrates compatibility for various types of batteries, multiple output levels, and intelligent protection. The product adopts a series-parallel configuration and features high conversion efficiency, wide voltage range, and large current output. It can meet the charging needs of multiple types of battery packs, including lithium iron phosphate batteries, lithium-ion batteries, lead-acid batteries, sodium batteries, and HV batteries, and is widely applicable in scenarios such as portable devices, energy storage power supplies, electric vehicles, power tools, industrial equipment, etc.

2. Product Features:

1. Color screen displays charging parameters and charging status.
2. Automatically detects battery voltage.
3. Can charge various types of batteries.
4. No sparking when connecting batteries, short circuits, or reverse battery connection.
5. Small size, with a maximum output voltage of 30.4V and a maximum output current of 40A.
6. Memory function, fully automatic charging, and power-off when fully charged.
7. Automatic variable-speed cooling fan.
8. PCBA is sealed with glue, preventing rain, dust, and moisture.

3. Product Panel:

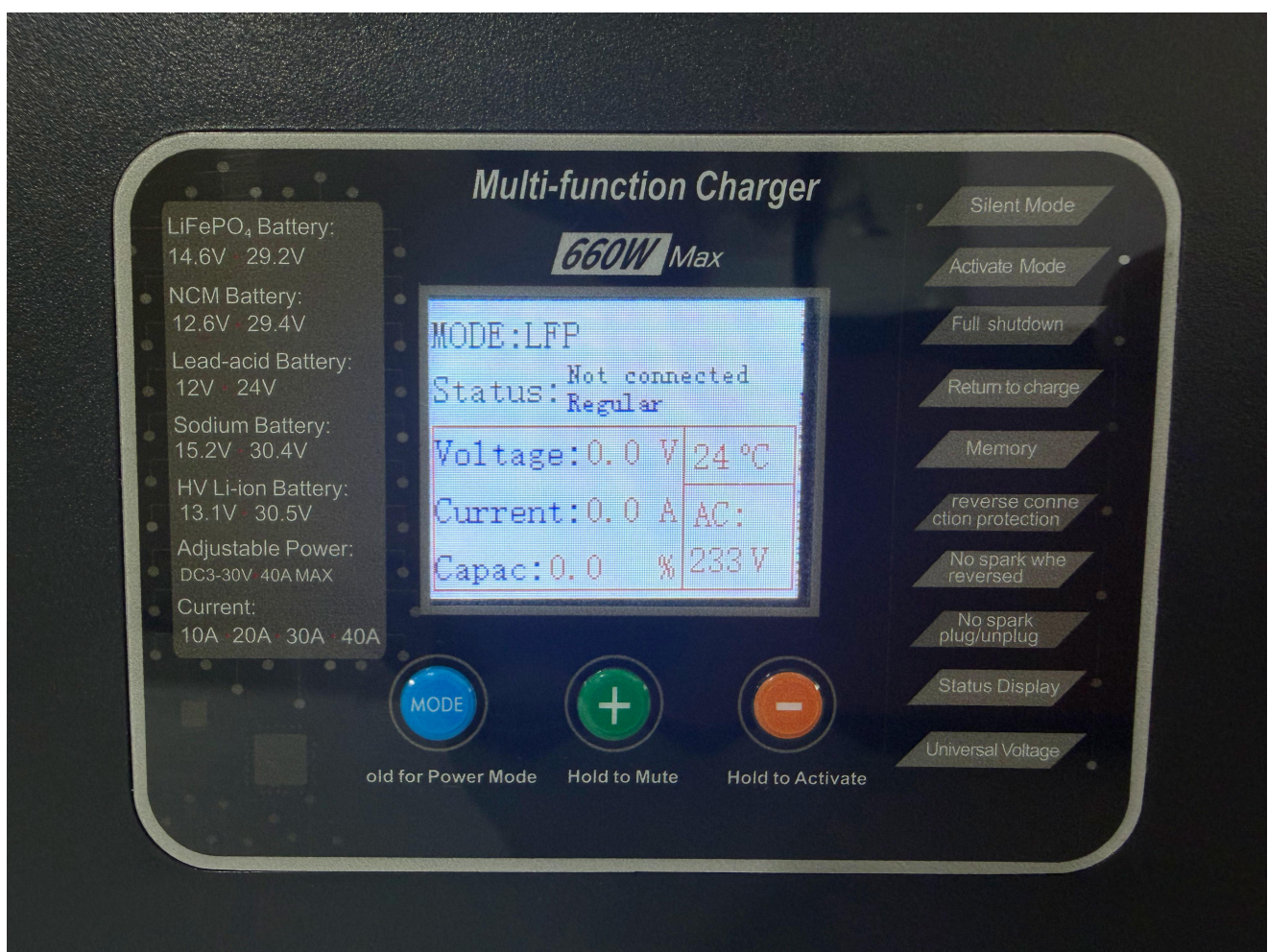
1. Adjustable power interface



- ① Voltage setting
- ② Current setting
- ③ Current output voltage

- ④ Current output current
- ⑤ Output status
- ⑥ Press and hold to enter power mode, click to select voltage, current, or output
- ⑦ Press the $\pm$ key to adjust, press and hold continuously for continuous $\pm$ adjustment
- ⑧ Press the - key to adjust, press and hold continuously for continuous - adjustment, select at the output position, click to turn on/off the output.

2. Charging Interface



- ① Current battery type
- ② The full charge voltage of the current battery.
- ③ Charging status.
- ④ Charging gear.
- ⑤ Current charging voltage.
- ⑥ Current charging current.

- ⑦Current battery capacity.
- ⑧Surface temperature.
- ⑨AC input voltage.
- ⑩Battery switch key. Long press to enter adjustable power supply.
- ⑪Gear switch key. Long press to directly switch to silent (fan does not rotate). Long
- ⑫press to activate charging.

4.Input Characteristics

Project	Indicators	Test conditions
Input voltage range	AC 100-240V	Wide voltage adaptive, supporting global grid standards
Input frequency range	47-63Hz	Compatible with variable frequency grid scenarios
Maximum input current	13A (@ 110V AC, full load) 6.5A (@ 220V AC, full load)	Output power 660W
Power factor (PF)	≥ 0.5 (full load)	AC 220v, 25° C normal temperature
Surge current	<30A	Cold start, AC 240V input

5. Output Characteristics

Project	Indicators	Type	Test conditions
Output voltage range	3 - 30V (adjustable continuously in steps of 0.5V)	Adjustable power mode	
Output current range	0.5 - 40A (adjustable continuously in steps of 0.5A)	Adjustable power mode	
Rated output power	660W	Charging mode / Adjustable power mode	220VAC input, 25° C
Conversion efficiency:	$\geq 90\%$ (at the board end) $\geq 85\%$ (at the wire end)	Charging mode / Adjustable power mode	AC220V input, 25° C

Output ripple and noise:	$\leq 800\text{mVp-p}$	Charging mode/ Adjustable power mode	1:1 probe for 20MHz bandwidth oscilloscope, grounded spring
Voltage regulation rate	$\leq -0.3\%$	Charging mode / Adjustable power mode	Input voltage 100-240V, full load
Load regulation rate	$\leq \pm 0.5\%$	Charging mode / Adjustable power mode	220VAC input, 25° C

6.Charging Phase Parameters

Charging stage	Control strategy	Key parameters	Status
Constant current charging (CC)	Constant current input, battery voltage gradually rises	Current accuracy $\pm 2\%$; The set current can be 0.3C to 1C of the battery capacity	When the battery voltage is lower than the constant voltage threshold
Constant voltage charging (CV)	Constant voltage input, charging current gradually decreases	Voltage accuracy $\pm$ 0.75%; The cut-off current of lithium battery is 0.1C;	When the battery voltage reaches the constant voltage threshold
Trickle charging	Low current for recharging, protecting the battery	The trickle current is 50% of the selected current and reduces to 10%; Automatically shuts off after charging	When the charging current drops to the cutoff current
Shutdown recharging	When not in use for a long time and keeping the charger connected	The battery capacity drops to 90% and can be recharged again	Fully post-deactivation

7.Chargeable Battery Types and Range

Battery type	Series number	Full voltage (V)	Recharge voltage (v)
LiFePO4 battery	4	14.6±0.75%	13.5±1%
	6	21.9±0.75%	20.25±1%
	8	29.2±0.75%	27±1%
	12	43.8±0.75%	40.5±1%
	16	58.4±0.75%	54±1%
Li-ion battery	3	12.6±0.75%	12±1%
	7	29.4±0.75%	28±1%
	10	42±0.75%	40±1%
	13	54.6±0.75%	52±1%
Lead-acid battery	1	14.6±0.75%	13.5±1%
	2	29.2±0.75%	27±1%
	3	43.8±0.75%	40.5±1%
	4	58.4±0.75%	54±1%
Sodium battery	4	15.2±0.75%	14±1%
	8	30.4±0.75%	28±1%
	12	45.6±0.75%	42±1%
	16	60.8±0.75%	56±1%
HV Li-ion battery	3	13.05±0.75%	12±1%
	7	30.45±0.75%	28±1%
	10	43.5±0.75%	40±1%
	13	56.55±0.75%	52±1%

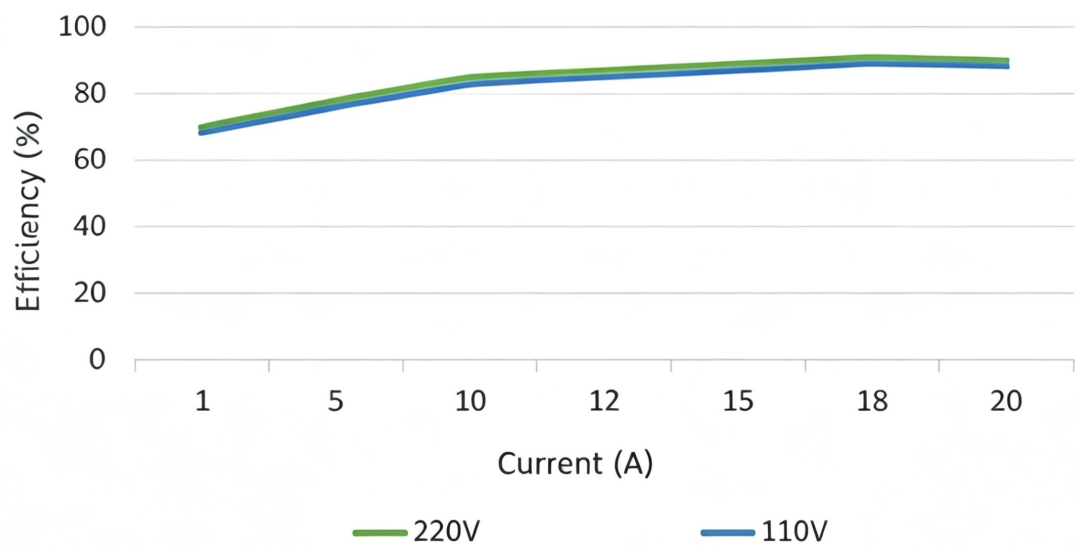
8.Charging Current

Charging voltage	Silent mode	Slow charging mode	Standard version	Fast charging mode
$\leq 15V$	10A MAX	$20A \pm 2\%$	$30A \pm 2\%$	$40A \pm 2\%$ / Input 220V / Temperature below 55℃ $38A \pm 2\%$ / Input 110V / Temperature below 55℃ $36A \pm 2\%$ / Input 100V / Temperature below 55℃
$>30V$	5A MAX	$10A \pm 2\%$	$15A \pm 2\%$	$20A \pm 2\%$ / Input 220V / Temperature below 55℃ $19A \pm 2\%$ / Input 110V / Temperature below 55℃ $18A \pm 2\%$ / Input 100V / Temperature below 55℃

9.Adjustable Power Supply Parameters

Set the voltage	Set the current	Voltage step-up	Current stepping	Conditions
3-30V	0.5-40A	0.5V	0.5A	220V Input
3-30V	0.5-20A	0.5V	0.5A	110V Input

10. Efficiency Curve



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11. Protection Function Parameters

Protection types	Protection threshold	Recovery methods
Overvoltage protection (ovP)	Output voltage > rated voltage by 115%	Reboot the device to restore
Overcurrent protection (OCP)	Output current > rated current by 120%	Restore automatically after fault resolution
Overtemperature protection (oTP)	Internal MOSFET temperature > 105° C; ambient temperature > 40° C	Restore automatically when temperature drops to 85° C (MOS transistor) / 40° C (environment)
Short circuit protection (SCP)	Output positive and negative terminals short-circuited	Restore automatically after short circuit is disconnected
Reverse connection protection	Positive and negative terminals of the battery connected in reverse (adjustable power supply mode cannot reverse the battery connection)	Work normally (no damage) after correcting wiring When the load drops below the rated power, it will automatically recover.
Overpower protection (OPP)	Output power > 330W (rated power by 110%)	Recovery methods

12. Reliability Test Parameters

Test type	Testing items	Test conditions	Criteria for judgment
Environmental reliability testing	High and low temperature cycling test	-10°C (kept for 2 hours) > room temperature (recovered for 1 hour) + 50°C (kept for 2 hours), repeat 50 times	After the test, the machine started up normally. The output parameter deviation was $\leq \pm 1\%$, and there was no performance degradation.
	Hydrothermal testing	Temperature 40° C, humidity 90%RH, for 72 hours	The outer shell was not rusted, and the internal components had no condensation or short circuits.
	Salt Spray Test	5% NaCl solution, neutral salt spray, for 48 hours	The functions were normal. The corroded area of the metal interface was $\leq 5\%$. The electrical performance was normal.
Mechanical reliability test	Vibration test	Frequency 10-500Hz, acceleration 10g, each axis (XY, Z) tested for 2 hours	The structure was not loose, the solder joints did not fall off, and the output ripple variation was $\leq 10 \text{ mVp-p}$.
	Impact test	Sine wave, peak acceleration 50g, pulse duration 11ms, each axis (XYZ) tested 3 times	There was no shell cracking, no component damage, and the function worked normally after power-on.

	Drop test	Height 1m, free drop to cement floor, each side dropped 1 time	The outer shell was not deformed, the interface was not damaged, and the charging function was not affected.
Electrical reliability testing	Aging test	Full load output, environmental temperature 30° C, for 1000 hours	The conversion efficiency degradation was ≤ 2%, and the output voltage drift was ≤ ±0.3%.
	Power on/off cycle test	Input voltage 220V, full load, power on/off interval 30 seconds, repeat 1000 times	Each time it was powered on, it could work normally without any freeze or parameter drift.
	Power on/off cycle test	Input voltage 85V (under voltage), 265V (over voltage), each tested for 2 hours	When the voltage was low, it automatically shut down. When the voltage was too high, it protected and operated. After returning to the normal voltage, it could work normally.

13.Environmental Characteristics

Project	Requirement indicators
Operating temperature range	-10° C t - +40° C (usage beyond this range requires reduction of specifications)
Storage temperature range	20°C - +60°C
Operating humidity range	10% - 90% relative humidity (no condensation)
Altitude	≤2000m (usage must be reduced if exceeding this limit)

14.Safetyand Standards

Compliant with the EU CE safety standards

15.Precautions

1. This equipment is prohibited from being used in high-temperature, humid and flammable environments.
 2. Before charging, make sure that the battery group specifications match the output parameters of the charger to avoid overcharging.
 3. Do not disassemble the casing during operation of the equipment.
- Non-professionals are prohibited from conducting internal circuit debugging.
4. When not in use for a long time, disconnect the input power supply and store it in a dry and ventilated place.

16.Mechanical Parameters

1. Shell dimensions: L182 * W102 * H65mm $\pm$ 1mm
2. Input cable: 1500mm $\pm$ 50mm, 3 * 1mm²
3. Output cable: 500mm $\pm$ 50mm, 2 * 4mm²

17.Outside view



18.Packing

Product weight: 1.25 Kg

Gross weight of the product: 1.65 Kg

Product packaging box dimensions: 245 * 165 * 95 MM