750W Li-Ion Diamond™ Series Battery Charger Data Sheet

Green Watt Power's 750W Diamond™ Series universal Li-ion battery on-board and off board chargers are designed with ultra-high efficiency a waterproof metal case enclosure. The extraordinary performance of low power dissipation directly results in higher reliability and longer lifetime of the charger. This series of chargers offer solid and safe power conversions for use in E-vehicles, E-motorcycles, E-boats, E-machines, I-robots, and similar applications.

Features:

- Universal AC Input: 90 – 264V.
- Output power: 735W, no derating
- Ultra wide DC output range: 15 – 29.4V
- Fast charging feature.
- High efficiency: Up to 92%.
- CAN communication.
- LED Status indicator.
- IP65 waterproof rating.
- All-Around Protections:
  OVP, UVP, OCP/SCP, RPP, OTP.
- Ambient temperature to 40 °C, fan cooled.
- Compact mechanical version with handle
  for Fixed On-Board or portable Off-Board mounting.

Model Selection Table

Input Voltage	Output Power	Output Voltage	Output Current	Efficiency (typ.)	Model Number (factory number)	Mechanical Dimensions
90 – 264VAC	735W	15 – 29.4VDC	2 – 25A	89% @ 120Vnom 92% @ 230Vnom	**EVC-30-750 *** (PLD750-EVCGX02-29)	225 x 137 x 73 mm (280mm incl. Handle)

Note: * Please contact nearest sales office for availability and MOQ.

General Condition: ***25°C ambient, input 230VAC @ full load unless noted.***

Input Specification		
Input Voltage	90 – 264VAC	
Input Frequency	45 – 65Hz	
Input Current Max.	7.5A @120VAC	3.75A @230VAC
Power Factor (min./typical)	0.98 / 0.99 @120VAC	0.97 / 0.99 @230VAC
Efficiency at full load (min./typical)	88% / 89% @120VAC	91% / 92% @230VAC
Output Specification		
Output Voltage (DC)	15 – 22V / 22 – 28.5V / 28.5 – 29.4V	
Voltage Accuracy	±1V / ±0.2V / ±0.2V	
Output Current	2 – 25A (±0.5A)	
Output Power	735W over the entire input voltage range	
Ripple & Noise	<500mVp-p (BW 20MHz, 0.1uF/10uF porcelain chip/electrolytic capacitor in parallel	
Communication	CAN (125k Baud rate, 240 Ohm termination)	
Turn On Delay	5.0s max. @ Full Load	
Protection	**OVP, OCP, SCP, OTP**	
Input Under Voltage Protection (UVP)	The charger shuts down when Vin drops to 80VAC (±5V) and auto-recovers when Vin raises above 90VAC (±5V)	
Output Over Voltage Protection (OVP)	OVP range is set between 30.7V-35Vout (SW set, latch mode). After removal of fault condition, recycle AC input to return to normal operation.	
Battery Under Voltage Protection	When the battery voltage is lower than 14V (±1V), the charger will not work. After the fault condition is removed, recycle the AC input to return to normal operation.	
Short Current Protection (SCP)	With the output in short-circuit mode, the power supply will not be damaged. After removal of fault condition, recycle the AC input to return to normal operation.	
Output Overcurrent Protection	When output current exceeds 27A for >2s, overcurrent protection is triggered. After removal of fault condition, recycle the AC input to return to normal operation.	
Reverse Polarity Protection	Self-protection mode is triggered with charger connected in reverse polarity. Recycle AC input after removal of fault condition to return to normal operation.	
Timing protection	After charging time of 12hrs.(±1hr.) the charger will shut down.	
Charger no-load protection	With Iout <0.5A (±0.2A), no-load protection is triggered within 5s. Recycle AC input to return to normal operation.	
Over Temperature Protection	Unit enters thermal protection when Tcase reaches 80°C ±5°C; auto-recovery with Tcase at or below 65°C ±5°C	
Operating Temperature Range	-20°C to +40°C with RH 10% to 85%	
Storage Temperature Range	-40°C to +85°C with RH 5% to 95%	
Surge Protection	1kV DM / 2kV CM	
Isolation Test Voltage	Prim. to Sec.: 3000VAC / Prim. to Earth: 1500Vac / Sec. to Earth: 500VAC Condition: Leakage current 10mA max. duration 60s max. (3s for production).	
Insulation Resistance	>100MΩ primary to secondary with 500VDC test voltage	
Intrusion & Moisture Protection	IP65 (excluding input connector).	

Electromagnetic Compatibility

Emission:

EN 55014-1/EN 55014-2/FCC PART 15 CLASS B (Test with the system).

Immunity:

EN61000-3-2: Harmonic Current Emission.

EN61000-3-3: Voltage Fluctuations and Flicker.

EN61000-4-2: ESD 15kV Air Discharge, 8kV Contact Discharge, Criteria B.

EN61000-4-3: Radio-Frequency Electromagnetic Field Susceptibility Test-Rs Level 3, Criteria A.

EN61000-4-4: Electrical Fast Transient/Burst-EFT 1kV, Criteria A.

EN61000-4-5: Surge Immunity Test, AC Power Line: Line to Line 1kV; Line to Earth 2kV Criteria B.

EN61000-4-6: Conducted Radio Frequency Disturbance Test-CS Level 3, Criteria A.

EN61000-4-8: Power Frequency Magnetic Field Test 3A/m, Criteria A.

EN61000-4-11: Voltage Dips, Criteria B.

Safety (Designed to meet):

EN60335 & UL62368

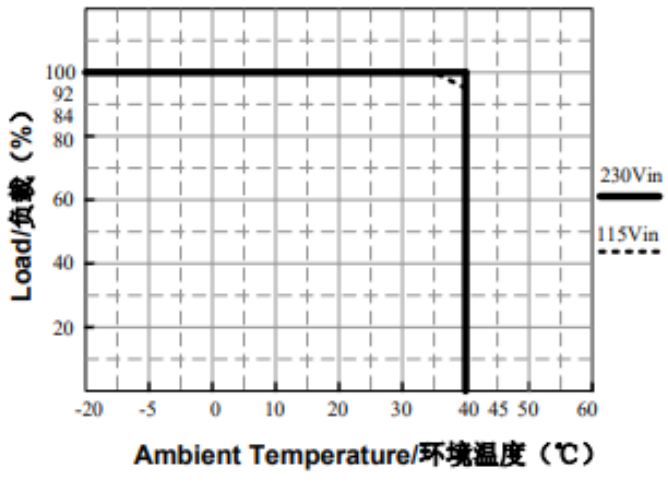
Fan control:

When the charger is working and the case temperature exceeds 40±5℃, the fan works. Then when the case temperature is below 35±5℃ or the charger is turned off, the fan stops working.

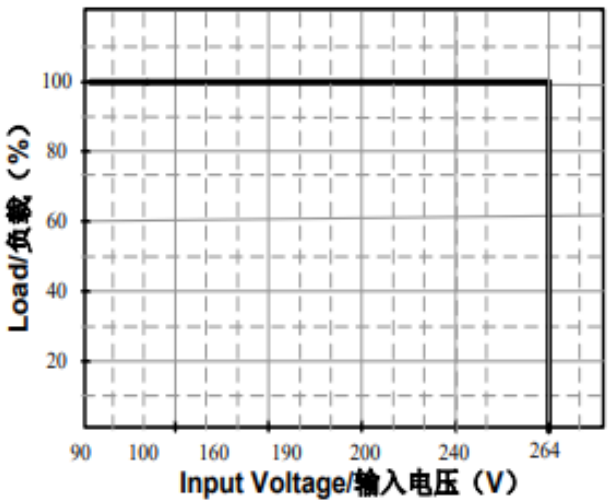
Communication Protocol:

The charger has a CAN communication function with a baud rate of 125kbit. The charger does have a terminal resistor of 240 Ohm by default. Please contact factory for specific documents and communication protocol.

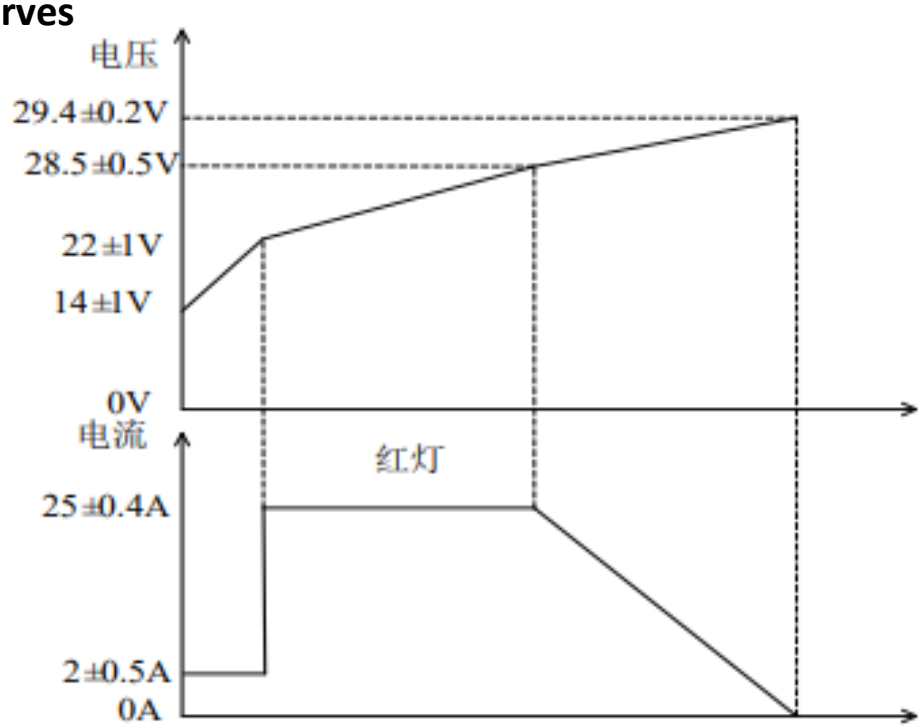
Derating: Input Voltage vs. Load



Temp vs. Load



Typical Charge Curves



Note:

1. The charging curve is based on the charging request, output current and voltage, sent by the BMS. When the requested current and voltage received are higher than the maximum output capacity of the charger, the charger outputs the current and voltage based on its own maximum output capacity.
2. When the BMS board sends a command to inform the completion of charging, the charger finished charging and the LED color changes to continuous green.
3. When the battery voltage is at 28.5 (±1V), the charger enters constant voltage mode.
When the battery voltage is between 22V and 28.5 (±1V), the charger operates in constant current mode.
4. Derating conditions should be considered for the actual output current.

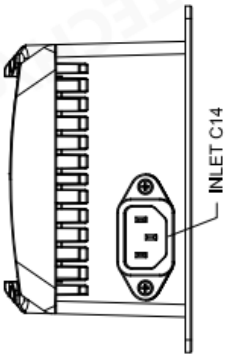
LED Status Indicator:

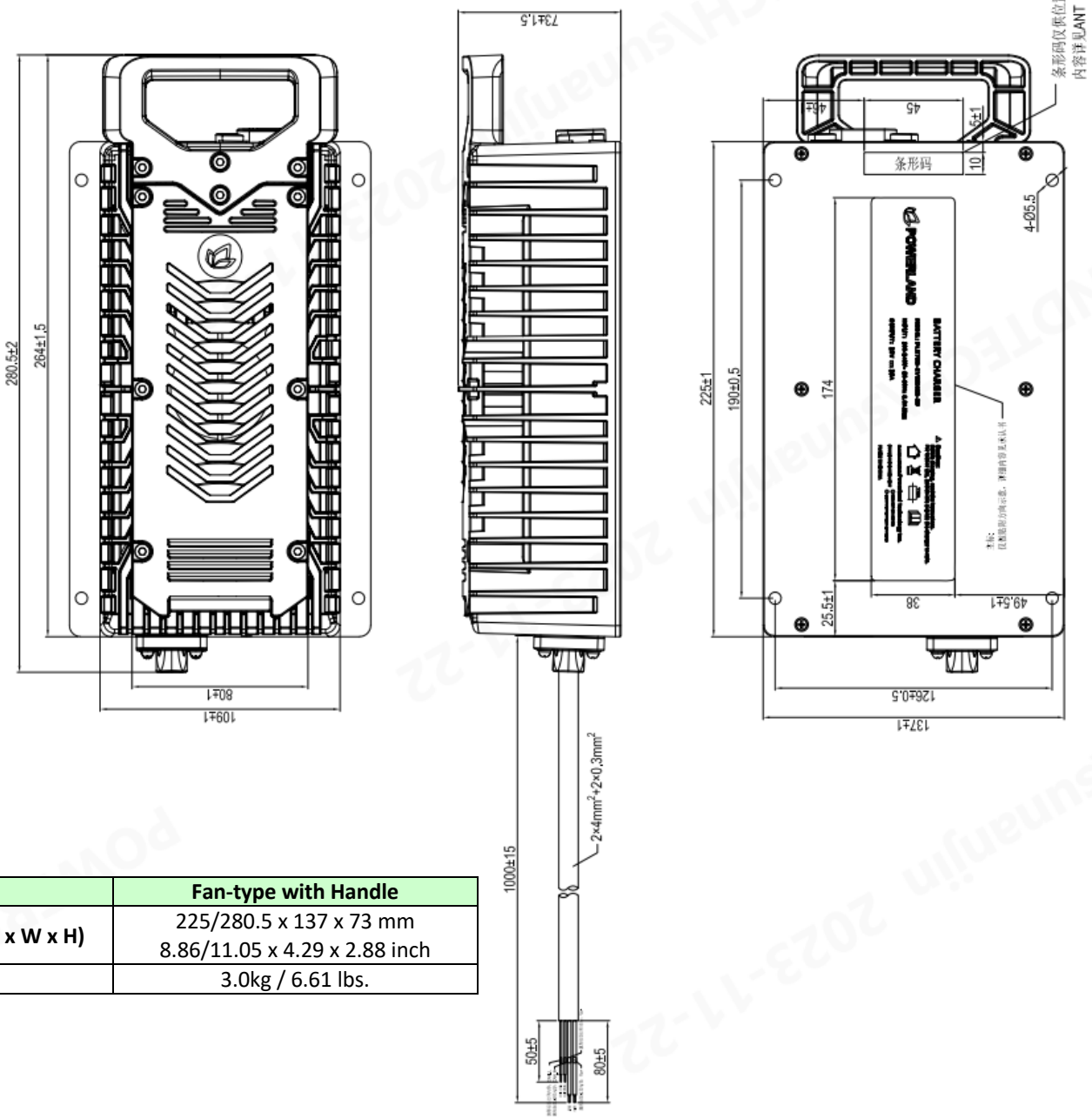
The LED indicator shows the charging status by color:

Battery Status	**LED Indicator**
Standby	Flashing GREEN
Battery fully charged (charging current <2A ±500mA)	GREEN
Battery charging (charging current >2A ±500mA)	RED
Fault Condition (OVP, UVP, OCP/Short Circuit, OTP, RPP）	Flashing RED

Note: During short-circuit protection, it is normal for the LED to blink from green to off and then to red again for a short time, which does not affect the protection function. It's normal for the LED to change to red when the output current is 600mA to 1000mA, because it is within the range of its hysteresis.

MECHANICAL DATA



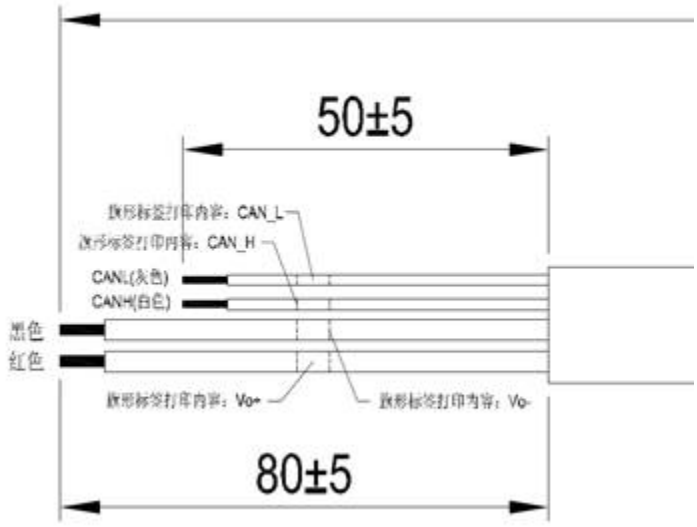


Mechanical	Fan-type with Handle
Dimensions (L x W x H)	225/280.5 x 137 x 73 mm 8.86/11.05 x 4.29 x 2.88 inch
Weight	3.0kg / 6.61 lbs.

Input Connector:

Standard IEC-C14 Plug.

Output Connection Details:

Output cable, 1000mm (±15) long, with color coded flying leads.

Function	Wire Color
CAN_H	White
CAN_L	Gray
BAT+	Red
BAT-	Black