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1. General Description 产品概述

This specification describes the performance characteristics of a 164W, CCCV output Li-ion battery charger, which is suitable for 13S 48V battery pack and the maximum charging current is 3A.

本规格书描述了一款功率 164W，恒压恒流输出的锂电池充电器的具体规格，其适用于 13 串 48V 电池组，最大充电电流为 3A。

2. Electrical Specification 电气规格

2.1. Input Characteristics 输入特性

Parameter 参数	Specification 规格			Note 说明
	Min. 最小值	Typ. 典型值	Max. 最大值	
Input Voltage 输入电压	200Vac	220-240Vac	264Vac	
Input Frequency 输入频率	47Hz	50/60Hz	63Hz	
Input Current 输入电流			1.8A	@220Vac, Full Load 输入 220Vac, 满载输出
Inrush Current 冲击电流			150A	@220Vac, Cold Start 输入 220Vac, 冷机启动
Efficiency 效率	92%	93%		@220Vac, Full Load Test at PCB board Terminal 输入 220Vac, 满载输出 PCB 板端效率
Standby Power Consumption 待机功耗			1W	@220Vac, No Load 输入 220Vac, 输出空载
Brownout 输入欠压	The power supply shall not damaged when the input voltage is below 200Vac 在输入电压低于 200Vac 的情况下，电源不会损坏			
Power Factor 功率因数	0.5			@220Vac, Full Load 输入 220Vac, 满载输出
Turn on Delay Time 开机延迟时间			3s	@220Vac, Full Load 输入 220Vac, 满载输出

2.2. Output Characteristics 输出特性

Parameter 参数	Specification 规格			Note 说明
	Min. 最小值	Typ. 典型值	Max. 最大值	
Constant Voltage Output 恒压输出电压 (CV)	54.2V	54.6V	54.8V	Test with 0.5A CC load 带 0.5A 恒流负载测试
No Load Output Voltage 空载输出电压			42.4V	RMS Voltage 有效值电压
Output Voltage Range with Trickle Charge Current 预充电电压范围	28V ± 1V		38V ± 1V	
Output Voltage Range with Quick Charge Current 快充充电电压范围	38V ± 1V		53V	

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Trickle Charge Current 预充充电电流 (CC1)	0.5A	0.6A	0.7A	
Fast Charge Current 快充充电电流 (CC2)	2.85A	3.0A	3.15A	
Charging End Current 充电截至电流	0.2A	0.35A	0.5A	
Output Current Ripple 输出电流纹波			0.9A	25°C, Battery Load, 20MHz Bandwidth 25°C 环温, 电池负载, 20MHz 带宽
Battery Reverse Current 电池反向电流			1mA	AC Power off AC 断电
Holdup Time 保持时间	8ms			@230Vac, Full Load 输入 230Vac, 满载输出

2.3. LED Indicator LED 指示灯

Red, yellow, blue light LED indicates the battery is on charging, and red light indicates that the battery level is less than 50%, yellow light indicates the battery level is between 50% and 75%, blue light indicates the battery level is between 75% and 100%. And the green light LED indicates the battery is fully charged.

红色, 黄色, 蓝色 LED 灯表示电池正在充电, 其中红色表示电池电量低于 50%, 黄色表示电池电量在 50%和 75%之间, 蓝色表示电池电量在 75%和 100%之间。绿灯表示电池已充满电。

2.4. Protection Characteristics 保护特性

2.4.1 Over Voltage Protection 过压保护

The output voltage that triggers over voltage protection less than 63Vdc. The power supply will enter auto-recovery mode during OVP, and it will return to normal operation after the fault condition is removed.

过压保护电压小于 63Vdc。产品过压保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

2.4.2 Over Temperature Protection 过温保护

The power supply enters over temperature protection mode when the ambient temperature over 60°C ± 10°C. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当环境温度高于 60°C ± 10°C 时, 产品进入过温保护状态, 保护模式为自恢复模式。当故障解除后产品恢复正常工作。

2.4.3 Short Circuit Protection 短路保护

The power supply will enter protection mode when the output is being shorted. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当输出短路时, 产品进入保护状态。保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

2.4.4 Reverse Connection Protection 反接保护

The power supply will enter protection mode when the battery is reverse connection. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当电池反接时, 产品进入保护模式。保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

3. Environmental Requirement 环境要求

3.1. Operation Temperature and Relative Humidity 工作温度和湿度

0°C ~ 35°C, 20% RH ~ 80% RH

0 ~ 35 摄氏度, 20%-80%相对湿度

3.2. Storage Temperature and Relative Humidity 存储温度与湿度

-10°C ~ 70°C, 10% RH ~ 90% RH, Non-Condensing

-10 ~ 70 摄氏度, 10%-90%相对湿度, 非凝露

3.3. Operation Altitude 工作海拔

0 ~ 5,000 meters

0 ~ 5,000 米

3.4. Ingress Protection Rating 防护等级

IP52

4. Reliability Requirement 可靠性要求

4.1. MTBF 平均无故障时间

The MTBF shall be more than 100,000 hours at 25°C, 230Vac input, and full load output.

产品平均无故障时间大于 100,000 小时, 在 25°C 环温, 230Vac 输入和满载输出情况下。

4.2. Electrolytic Capacitor Lifetime 电解电容寿命

The lifetime of electrolytic capacitor shall be more than 10,000 hours at 25°C, 230Vac input, and full load output.

产品电解电容寿命大于 10,000 小时, 在 25°C 环温, 230Vac 输入和满载输出情况下。

4.3. Drop Test 跌落测试

Drop to concrete surface, 80cm height, 1 drop on each face

水泥材质地面, 80 厘米高度, 每个面 1 次

4.4. Vibration Test 振动测试

Frequency: 10-300Hz, Acceleration: 1G, Breadth: 3.5mm, 1hour for each direction of X, Y, Z.

频率: 10-300Hz; 加速度: 1G; 振幅: 3.5mm; X, Y, Z 轴每个方向 1 小时。

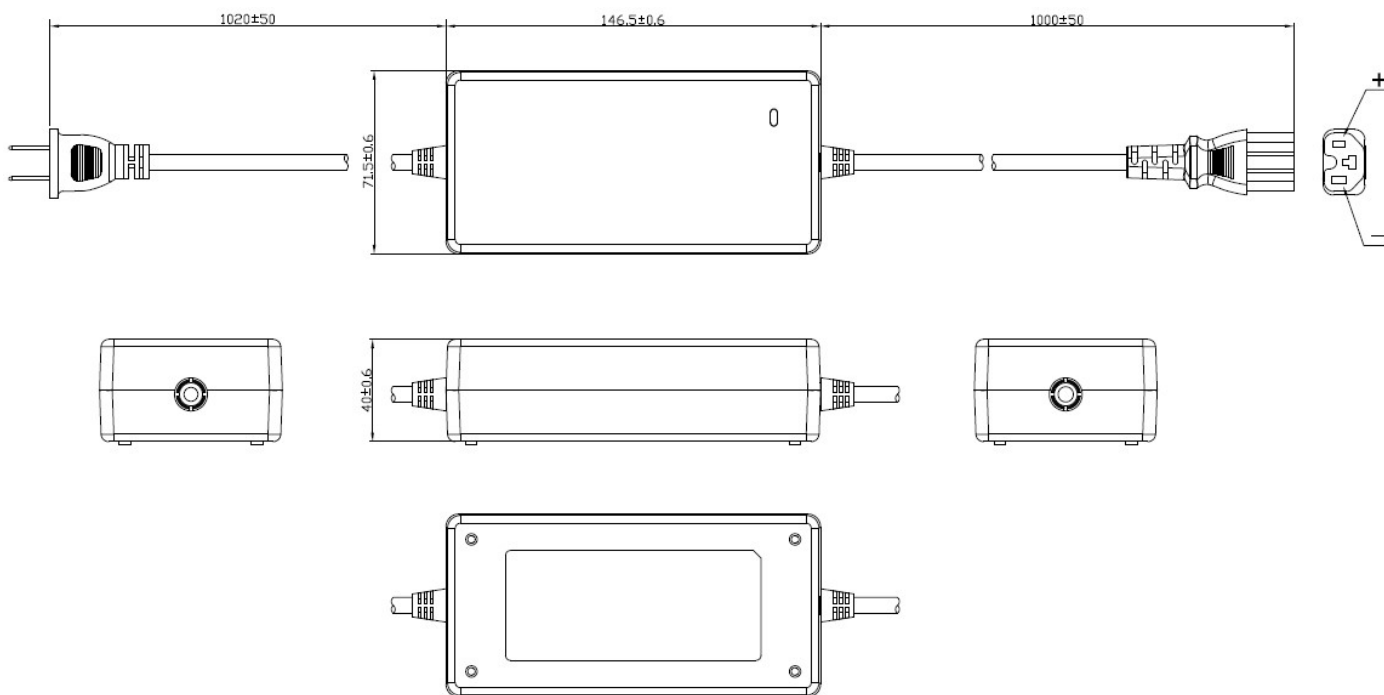
5. Acoustic Noise 噪音

<25dB, Measured at the distance of 1m. Test at 230VAC/50Hz input and with all load condition.

小于 25db, 距离电源 1 米处测量, 测试条件为输入 230VAC/50Hz, 输出任意负载。

6. Mechanical Specification 机构规格

6.1. Dimension and Outline Drawing 尺寸和外观图



Physical size: $146.5 \pm 0.6\text{mm(L)} * 71.5 \pm 0.6\text{mm(W)} * 40 \pm 0.6\text{mm(H)}$

Material: PC

Color: BLACK

Unit: mm

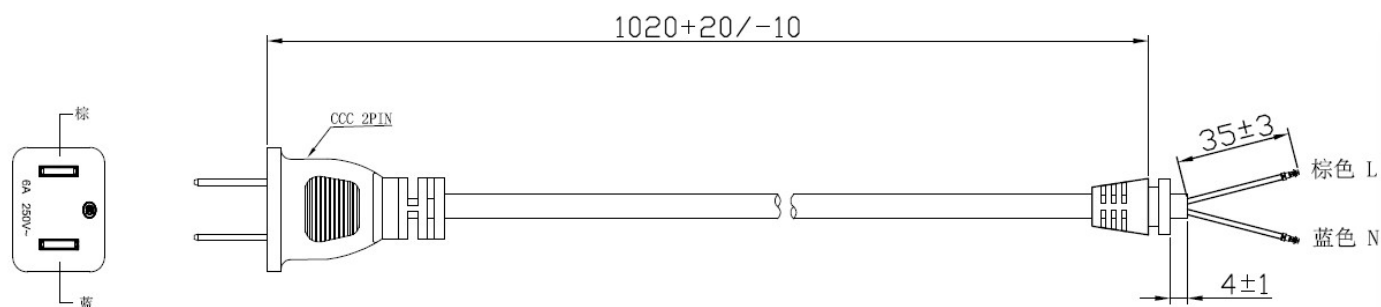
结构尺寸: $146.5 \pm 0.6\text{mm(L)} * 71.5 \pm 0.6\text{mm(W)} * 40 \pm 0.6\text{mm(H)}$

材质: PC

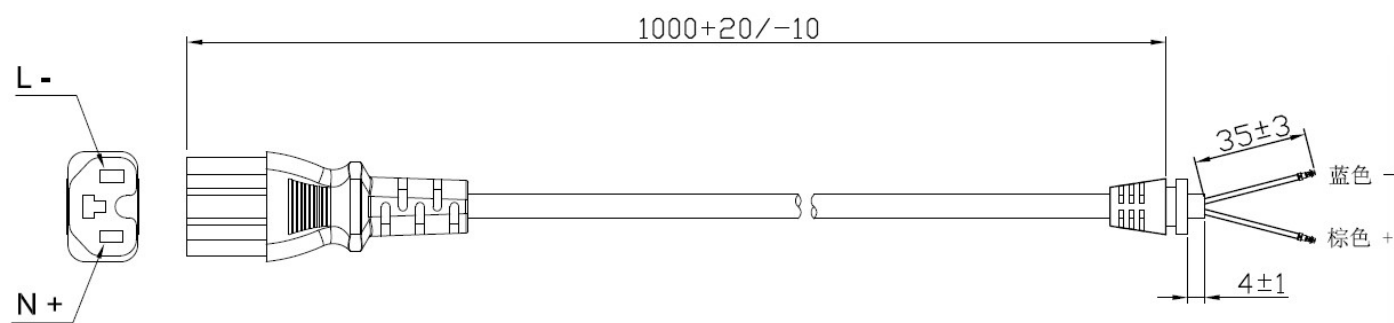
颜色: 黑色

单位: 毫米

6.2. AC Cable Specification AC 线规格



6.3. DC Cable Specification DC 线规格



7. Regulatory Requirement 法规要求

7.1. Safety Approval 安规认证

The power supply shall be certified under the following regulatory standards: QB/T2947.3-2008
 产品符合如下认证标准: QB/T2947.3-2008

7.2. Hi-Pot Voltage 耐压

Primary to secondary : 3, 000Vac/5mA/60s (3s for production)
 原边对副边: 3, 000Vac/5mA max. /60s (生产测试时间: 3s)

7.3. Leakage Current 漏电流

0.75mA max. @240Vac/50Hz
 最大 0.75mA, 在输入 240Vac/50Hz 条件下测试

7.4. Insulation Resistance 绝缘阻抗

Primary to secondary: 100Mohm min. @500Vdc test voltage
 原边对副边: > 100Mohm @500Vdc 测试电压

8. Notes 充电器注意事项

- 1). This charger is only suitable for 48V Li-ion battery. 此充电器仅适用于 48V 锂电池。
- 2). Charge for non-chargeable battery is forbidden. 禁止给不可充电电池充电。
- 3). Charging is forbidden if the charger's cable is damaged. 充电器线损坏时, 禁止充电。

9. Revision History 版本记录

Revision /版本	Change Description / 变更描述	Date /日期	Author /作者
00	Preliminary release	2020-10-17	