
产 品 规 格 书

SPECIFICATION SHEET



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前言/Foreword

尊敬的客户！

使用这款开关电源变换器，您购买了一款高性能产品。该设备是一种使用危险电压和电流的电力电子产品，因此需要在处理和操作此类系统方面具有特殊专业知识！

在安装或对其进行任何其他操作之前，请仔细阅读本手册，尤其是用户须知一章！

Dear Customer!

With the switching power supply converter, you have purchased a high-performance product. The device is a power electronics product which uses dangerous voltage and current, thus special expertise with respect to handling and operation of such systems is required!

Read this manual – particularly the chapter User Notice before you install the device or any other operation work on it!


信息 INFORMATION

下面简要介绍了这款开关电源变换器的性能和多功能性。在阅读本手册时，您会发现有关各个属性的详细信息。

Below there is a short overview of the performance and versatility of the switching power converter. You will find details on the individual properties as you read through this manual.

1. 产品简介/Product introduction

DA6K6M20C-400C 是一款 OBC 开关电源变换器，采用先进的全数字谐振调频技术，效率高。与同类产品相比，更加节能、体积小、工作可靠。充电方式采用自有专利技术，恒压、恒流、恒功率状态自动转换充电方法，有效节省充电时间；具有有源功率因数校正功能，对

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电网低污染；输入和输出电压范围宽；采用 CAN2.0B 通信协议；具有智能充电功能、智能监测故障告警保护功能、烧写、故障查询等功能；同时内置 12V 供电电池管理系统唤醒信号电源。具有与充电桩连接的控制导引功能（可选）等。

该款电源专为新能源汽车高压电池充电而设计,与国际一流汽车电源厂商完全同步，各项性能指标已达到或超越国际同行水平，无故障运行时间更长。该系列电源也可适用于需要恒压、恒流、恒功率充电的各个领域。


DA6K6M20C-400C is an OBC switching power converter. The charger adopts advanced all-digital resonant frequency modulation technology, which has high efficiency, high power, small size and reliable operation. The charging mode adopts constant power, constant voltage and constant current automatic state transition, which effectively saves charging time. With active power factor correction, zero pollution to the grid, wide input and output voltage range, using CAN2.0B communication protocol. With intelligent charging function, it has intelligent monitoring fault alarm protection function, program me function and fault inquiry function; it also has built-in 12V independent auxiliary power supply for power supply of car battery management system.

This power supply is specially designed for charging high-voltage batteries of new energy vehicles. which is completely synchronized with the world-class automobile power supply manufacturers. The performance indicators have reached or exceeded the international peer level, and the fault-free running time is longer.

2.安全和警告说明/Safety and warning instructions

在本章中，您可以找到适用于该设备的安全说明。这些说明涉及车辆的装配、启动和运行操作。务必阅读并遵守这些说明，以保护人们的安全和生命，避免损坏设备！

In this chapter, you will find safety instructions applying to this device. These instructions refer to the assembly, start-up and the running operation in the vehicle. Always read and observe these instructions in order to protect people's safety and lives and to avoid damage to the device!

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2.1 符号及其含义/Symbols and meaning



在本手册中，使用了某些特定的符号。下表概述了这些缩写及其含义


Throughout this manual, certain specific symbols are used. The following table provides an overview of these abbreviations and their meaning:

符号 Sign	含义 Meaning	符号 Sign	含义 Meaning
	一般禁令 General prohibition		警告高压!Warning High Voltage! 请勿触摸 Do not touch
	请勿闭合 Do not close		

符号 Sign	含义 Meaning	符号 Sign	含义 Meaning
	危险区域的一般警告 General warnings for hazardous areas		警告! 触电! Warning! Electric shock!
	警告! 爆炸性环境! Warning! Explosive!		警告! 电池造成的危险! Warning! Danger caused by batteries!
	警告! 表面烫手! Warning! Hot surface!		警告! 高电压! Warning! High voltage!
	警告! 高压/液体喷射! Warning! High pressure/liquid injection!		警告! 火灾危险! Warning! Fire hazard!

符号 Sign	含义 Meaning	符号 Sign	含义 Meaning
	断开设备与电源的连接 Disconnect device from the power supply		断开设备与电源的连接 Disconnect the device from the power supply

符号 Sign	含义 Meaning	符号 Sign	含义 Meaning
	关于避免可能的财产损失的 重要信息 Important information on avoiding potential property damage		重要信息 Important information

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2.2 一般适用的安全措施/Generally applicable safety measures

以下安全措施是根据制造商的经验制定的。它们是不完整的，但是它们可以由当地或国家特定的安全说明和事故预防指南来补充。

The following safety measures have been developed based on the experience of the manufacturer. They are incomplete but they can be supplemented by local or country's specific safety instructions and guidelines for accident prevention.

2.2.2 机械系统安全说明/Safety instructions for mechanical systems

爆炸性环境！生命危险！/ Explosive environment! Danger to life!

- 请勿将任何高度易燃物质或易燃液体直接存放在设备周围。设备连接处形成的火花可能会点燃并导致爆炸！

Do not store any highly flammable substances or combustible fluids in the direct surroundings of the power supply! Sparks forming at device's connections can set these on fire and lead to explosions!



表面烫手！烧伤危险！/ Hot surfaces! Burn hazard!

- 该设备在运行时会产生高温！因此，在任何时候都要小心操作该设备！

The device produces high temperatures when in operation! Therefore, the device is to be handled with care and caution at all times!

2.2.3 搬运和操作安全说明/Safety instructions for handing and operation




高压电池损坏/ HV battery damaged:

- 确保设备的电压范围符合高压电池的电压范围。

Make sure that the voltage range of the device complies with the voltage range of the HV battery.

- 只能使用技术上合适且高质量的电缆。

Only use technically suitable and high-quality cables.

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充电器损坏/ **Damage to the charger:**

- 连接设备时，务必确保电源电压在允许范围内。

When connecting the device, always ensure that the voltage is within the permissible range.

- 冷却水温度或环境温度过高会缩短使用寿命。因此，请确保设备持续充分冷却。

A high cooling water temperature or high ambient temperature will reduce the life span. Therefore, ensure that the device is continuously cooled sufficiently.

- 请勿将设备安装在阳光直射和热源附近。

Do not install the device in direct sunlight and in direct proximity to heat sources.

- 即使设备具有高 IP 防护等级，也应避免与水（雨水、飞溅的水）和污垢直接接触。

Even though the device has a high IP protection class, direct contact with water (rain, splashing water) and dirt should be avoided.

- 在任何情况下，都不应在高压触点、外壳触点和低压触点之间设置低电阻连接。

这将导致故障，并瞬时导致设备损坏。

Under no circumstances should you put a low-resistance connection between the HV contacts, the housing contacts and the LV contacts. This will lead to malfunctions and destruction to the device

2.2.4 电气系统安全说明/Safety instructions for electrical systems



高电压！生命危险！/ **High voltage! Danger to life!**

- 在未事先确保无电压的情况下，切勿触摸高压电线或高压连接。

Never touch the HV wires or HV connections without ensuring the absence of voltage beforehand.

- 该设备只能由专业人员连接。

The device can only be connected by a professional person.

- 绝不能绕过或规避安全装置。任何由此产生的故障都可能造成危及生命的后果！

Safety installations must never be by-passed or circumvented! Any resulting malfunctions could

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have life threatening consequences!

- 切勿将设备连接到没有保护接地导线的插座上。

Never connect the device to a socket without a protective earth conductor.

- 始终考虑在电源连接线上增加剩余电流保护装置。

Always consider adding residual current protection devices on the power connection line..



电缆损坏！火灾危险！ / Damage to the cable! Fire hazard!

- 如果将卷轴电缆用在电源连接的延长线上，它可能会因热量积聚而点燃！ 因此，请始终将电缆从卷轴上完全展开。

If a cable drum is used as an extension cord to the mains connection, it might ignite due to heat accumulation! Therefore, Please always fully unfold the cable from the reel.



在 高压系统上工作时，必须严格遵守以下 5 条安全规则 /When working on a HV system, the following 5 safety rules have to be strictly adhered to:

1) 断开系统电源 / Disconnect system power supply

- 关闭点火开关。

Switch off the ignition.

- 取下维修/保养插头，关闭主蓄电池开关

Remove service / maintenance plug and turn off main battery switch.

- 拆下保险丝。

Remove fuse.


2) 确保系统无法重新激活 / Ensure that the system cannot be reactivated

- 保管点火钥匙，防止未经授权的人进入。

Keep ignition key safe to prevent unauthorized person access.

- 保持维修/维护插头的安全，以防止未经授权的访问和使用可锁定的盖帽，以确保主蓄电池开关不会重新激活。

Keep the service/maintenance plug safe in order to prevent unauthorized access and use lockable

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cover cap to ensure that the main battery switch is not reactivated.

3)使用合适的电压测试仪确保设备断电 (注意电压范围)。


Ensure that the device is de-energisedby using a suitable voltage tester (pay attention to the voltage range) .

4)接地并使系统短路。

Earth and short-circuit the system.

5)覆盖或隔离相邻带电部件。

Cover or isolate adjacent live parts.

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3.主要规格/Power Supply Overview

额定功率 Rated Power	输入电压范围 Input Voltage Range	输出电压范围 Output Voltage Range	输出电流范围 Output Current Range	稳压精度 Precision of Voltage Regulation	功率因数 Power Factor
6.6KW	AC85V~ AC264V Vac	300-550Vdc	≤18A	≤±1%Vo	≥0.99 @ 230Vac/ 400Vdc/16.5A
		辅路/auxiliary: 12V	≤0.16A		

4.电性能指标/Electrical performance


4.1输入特性/ Input Electrical Characteristics

项目/Item	指标/Index
额定输入电压 Rated Input Voltage	220Vac
输入电压范围 Input Voltage Range	85Vac ~ 264Vac
频率范围 Frequency range	45Hz~63Hz
最大输入电流 Maximum Input Current	32A
启动冲击电流 Start Inrush Current	<15A
最高效率 MAX Efficiency	94% (不包括辅路电源) (Excluding auxiliary power supply)
功率因数 Power Factor	≥0.99@230Vac/400V/16.5A
输入电流 THD Input current THD	<5%@ 230Vac, Po≤6600W, Vo≥400V, f=50Hz

4.2输出特性/Output Electrical Characteristics Overview

4.2.1电性能参数/Electrical Characteristics Overview

项目/Item	指标/Index
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额定输出功率 Rated Output Power	6.6KW(@230Vac~264Vac) 辅路/Auxiliary circuit : 2W
额定输出电压 Rated Output Voltage	主路: 400Vdc 辅路: 12V (12-13.5 不稳压) Main circuit :400Vdc Auxiliary circuit : 12V(12-13.5 Not stabilized)
输出电压范围 Output Voltage Range	300Vdc~550Vdc
额定输出电流 Rated Output Current	主路: 16.5A 辅路:0.16A Main circuit: 16.5A Auxiliary circuit : 0.16A
输出电流范围 Output Current Range	≤18A
温度系数 (1/℃) Temperature Factor	≤±0.002%
稳压精度 Precision of Voltage Regulation	≤±1%Vo 输入 176Vac-264Vac, 输出 20%-100%负载 ≤±1%Vo Input 176Vac-264Vac, output 20%-100% load
稳流精度 Precision of Current Regulation	≤±1.5%
输出电压整定误差 Output Voltage Tuning Error	≤±0.5%
输出电流整定误差 Output Current Tuning Error	≤1A
负载效应 Loading Effect	≤±0.5%
源效应 Source Effect	≤±0.5%
输出电压过冲 Output Voltage Overshoot	≤±5% (开关机/负载动态) (Switch on and off/load dynamic)

4.2.2输出纹波和噪声/Output Ripple & Noise

输出电压 Output Voltage	纹波和噪声 (峰-峰值) Ripple & Noise(Peak-Peak value)
300-550Vdc	≤2% Vo 辅路: ≤1V 20M 示波器, 双绞线测试 auxiliary circuit:≤1V, 20M oscilloscope, twisted-pair test.

注: 纹波和噪声测试: 纹波和噪音带宽设置在 20M 赫兹。

Note: Ripple and noise test: Ripple and noise bandwidth are set at 20M Hz.

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4.2.3输出电流特性/Output Current Characteristics

充电模式 Charging Mode	功能/Function
恒压/Constant voltage	OBC 可根据负载状况及控制指令或要求进行模式自动切换, 控制指令优先 OBC can transfer charging mode automatically according to load condition and command order, command order priority.
恒流/Constant current	
恒功率/Constant power	

注/Note:

- 1) OBC 输出电流上升至最大工作电流时间 $\leq 5s$, 超调量小于 5%;
OBC output current rises to the maximum working current time $\leq 5s$, and overshoot is less than 5%;
- 2) 上升时间以发送工作指令时间作为起始判断依据, 以电流稳定至最大输出电流时作为终止判断依据。
The rise time is based on the time when the work order is sent as the initial judgment, and the current is stabilized to the maximum output current as the termination judgment.

4.2.4 开机输出延迟时间/Delay Time at Turn On

输出电压 Output Voltage	时间/Time
400Vdc	1s~3s (输入 input 230Vac@25℃)

4.2.5工作状态/Working State


OBC 工作状态分为:

OBC working status as below:

工作状态 Working Status	功能/Function
充电状态 Charging status	充电机所带负载为动力电池工作 The load on the charger is working for the power battery
加热状态 Heating status	充电机所带负载为动力电池加热装置工作 The load on the charger is working for the power battery heater
充电状态+加热状态 chargingstatus+heating status	充电机负载为动力电池和电池加热装置 Charger load is power battery and battery heater

注/Note:

- 1) 工作状态可自由组合/Working status can be freely combined;

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2) 当电池加热状态完成后切换为充电模式之前, 如果 BMS 下发停止指令且 BMS 主正、主负未吸合继电器情况下, 此时充电机会上报电池未连接故障(充电机关机时恢复为充电模式)。

When battery finished heating status and before transfer to boot-strap mode, if BMS issue stop order and BMS main positive and negative relay not absorb, at this time charger will report battery not connecting fault(charger will return to charging mode when power off).


4.3 保护功能/Protection function

4.3.1输出过流保护/Output Over Current Protection

输出过流保护 Output Current Limited Protection	功能/Function
>23A($\pm 0.3A$)	输出端电流超出设计输出电流阈值, OBC 自动关闭输出; 当故障消除后可自动恢复。 When output current exceeds the design output current threshold, OBC will automatically turns off output; Charger will automatically recover when the fault is removed.

4.3.2 输出短路保护/Output Short Circuit Protection

输出短路保 Output Short Circuit Protection	功能/Function
启动前输出短路 Output short circuit before starting	启动前, 输出端已出现短路时, 收到工作指令后 OBC 将不启动, 并上报告警; 故障排除后, OBC 不能自动恢复正常工作, 需重新上电开机 Before starting, when output end has a short circuit, OBC will not start after receiving work instruction and will report an alarm; after troubleshooting, OBC cannot automatically resume normal work, needing to be re-powered on.
工作过程中输出短路 Output short circuit during operation	在工作的过程中, 输出端短路时, OBC 自动关闭输出, 并上报告警, 短路故障消除后, 不能自动恢复正常工作, 需重新上电开机 During working, when output end is short-circuited, OBC automatically turns off output and reports an alarm. After troubleshooting, OBC cannot automatically resume normal work, need to be re-powered on.

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4.3.3 输出过压保护/Output over Voltage Protection

输出过压保护点/Output over Voltage Protect Point	功能/Function
$\geq 561 \text{ Vdc} \pm 10 \text{ Vdc}$	<p>在输出端电压高于 561Vdc 时，OBC 停止工作，并上报告警信息。故障消除后自动恢复正常工作</p> <p>When output voltage $> 561 \text{ Vdc}$, OBC stops working and reports an alarm. After troubleshooting, it will automatically resume normal operation.</p>

4.3.4 输出欠压保护/Output under Voltage Protection

输出欠压保护点 Output under Voltage Protect Point	功能/Function
$< 289 \text{ Vdc} \pm 10 \text{ Vdc}$	<p>当输出端电压低于 289V 时，OBC 停止工作，并上报告警信息，当电压高于输出欠压恢复 299V 后，OBC 停止告警并自动恢复正常工作</p> <p>When output voltage $< 289 \text{ V}$, OBC stops working and reports an alarm message. When output voltage recovers to 299V, OBC stops alarming and automatically resumes normal operation</p>

4.3.5 输入过压保护/Input over Voltage Protection


输入过压保护点 Input over Voltage Protect Point	功能/Function
$> 275 \text{ Vac} \pm 10 \text{ Vac}$	<p>$> 275 \text{ Vac}$ 时，关闭输出，并上报告警信息；</p> <p>$> 275 \text{ Vac}$, output is turned off and an alarm is reported.</p> <p>$< 265 \text{ Vac}$ 时，恢复正常工作，并停止告警</p> <p>$< 265 \text{ V}$, resume normal operation and stop the alarm.</p>

4.3.6 输入欠压保护/Input under Voltage Protection

输入欠压点 Input under Voltage Protection Point	功能/Function
$< 74 \text{ Vac} \pm 10 \text{ Vac}$	<p>$< 74 \text{ Vac}$ 时，关闭输出，并告警；</p> <p>$< 74 \text{ Vac}$, turn off output, and alarm;</p> <p>$> 84 \text{ Vac}$ 后，恢复正常工作，并停止告警</p> <p>$> 84 \text{ Vac}$, resume normal operation and stop the alarm</p>

4.3.7 CAN通信故障/CAN Communication Fault

CAN 通信故障 CAN Communication Fault	功能/Function
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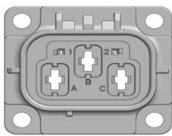
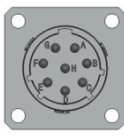
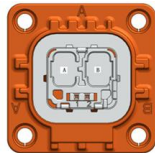
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连续 5s 未收到 BMS 或 VCU 指令 No BMS or VCU command received for 5s consecutively	OBC 立刻停止工作并上报 CAN 通信故障; OBC immediately stops working and reports CAN communication failure. CAN 总线恢复且稳定, 响应工作指令 CAN bus is restored and stable, responding to work orders
---	---

4.3.8过温保护/Over Temperature Protection

过温保护 Over Temperature Protection	功能/Function
OBC 内部温度 $>80^{\circ}\text{C}$ OBC inner temperature $>80^{\circ}\text{C}$	温度告警并控制输出电流开始降额 Temperature alarm and control output current start derating. 阶梯式降额, 温度每升高 1°C , 功率降低 300W For every 1°C increased in temperature, power is reduced by 300W.
OBC 内部温度 $>90^{\circ}\text{C}$ OBC inner temperature $>90^{\circ}\text{C}$	关机, 温度降低至 65°C 后, OBC 应能自恢复启动 Shutdown, after the temperature is lowered to 65°C , the OBC should be able to start spontaneously.

5.接口定义/Interface Definition

图示 Illustration			
端子名称 Terminal Name	ACIN 输入端子 ACIN Input Terminal	CAN 控制端子 CAN Control Terminal	Vout 高压输出端子 Vout High Voltage Output Terminal
产品端插件型号 Connector part NO. (Product end)	HV02-F3P(40A)-MA-1	RT00128PN03	EVH2-N2ZJ-TA
插件制造厂商 Connectors Manufacturer	中航光电 JONHON	安菲诺 Amphenol	中航光电 JONHON
产品端插件定义 Connector Definitions (Product)	A:ACL C:ACN B:PE	A: CAN-H G: CAN-L B: 12V+/0. 16A C: 12V-/0. 16A	1:HVO+ 2:HVO-

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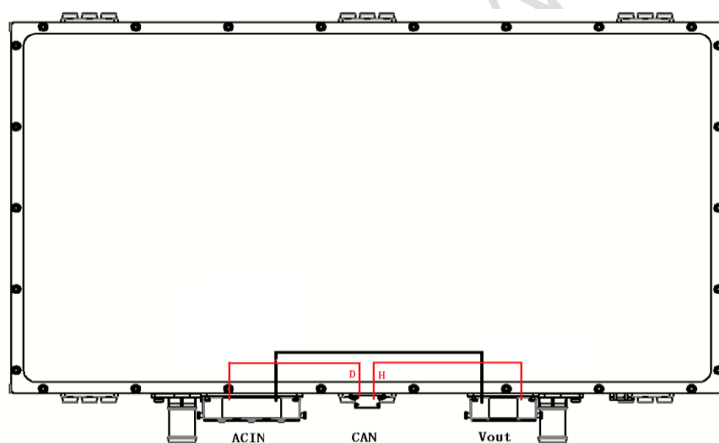
		E: 互锁 interlock1 F: 互锁 interlock2 Other: NC	
插件压接线径 Connector wire diameter	ACL, ACN: 6mm ² PE : 6mm ²	B.C: 0.5mm ² 通讯屏蔽线 Communication shielded wire: 0.35mm ²	4mm ²
线束端插件型号 Connector part NO. (Harness end)	HV02-M3S(40A)-M00A-1	RT06128SNHEC03	EVH2-N2TK-TDA

注/Note :B .C 引脚 作为唤醒信号使用,禁止与电池并联在一起

Pin B and C is only used as BMS wake up signal, do not parallel Pin B and C with battery.

注/Note :B.C引脚为OBC内部对外输出的/ **Note :Pin B and C is OBC insidec foreign output**

6.OBC连接器内部互锁连接示意图/OBC Connector inside interlock connent sketch map




AC 输入端子与输出端子各带互锁功能

AC input Terminal And output Terminal various carry interlock function

输入端子互锁线与输出端子互锁线其中一端内部串联另外一端分别连接至 CAN 端子的 E.F 引脚

Input terminal interlock line And output Terminal interlock line among one end inside in series in addition one end part connect to CAN Terminal E.F Pin

互锁能够监测充电器的输入输出插头连接。互锁引脚的接线不会影响充电器的功能，为了确

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保安全，我们强烈建议使用互锁系统！

Interlock can monitor the input and output plug connections of the charger. It also allows monitoring of input and output plug connections at the charger. Wiring of the interlock pins does not influence the functionality of the charger, in order to ensure safety, we strongly recommend that an interlock system is employed!

7. 动态响应时间/Transient Response Time

动态响应时间/Transient Response Time	功能/Function
电流调整/Current adjustment	<2s
功率切换/Power switching	<200ms

8. 接地说明/Ground Description

接地/Ground	功能/Function
整车地 Vehicle GND	整车地与机壳可靠连接 The vehicle ground is reliably connected to the casing

9. 绝缘性能/Insulation Characteristics

项目/Item		技术指标/Index
绝缘耐压 Insulation voltage	输入-输出/ input - output	2.8kVdc/1min
	输入-机壳/ input - casing	2.8kVdc/1min
	输出-机壳/ output - casing	2.8kVdc/1min
绝缘电阻/Insulation resistance		25℃,70%RH 条件下，各独立电路与机壳的绝缘电阻不低于 20MΩ。无电气连接的各电路之间的绝缘电阻不低 20MΩ Under 25℃ and 70% RH condition, the insulation resistance of each independent circuit and chassis is not less than 20MΩ. The insulation resistance between the circuits without electrical connection is not less than 20MΩ
接地电阻/Grounding resistance		≤100mΩ

10. 降额/Derating

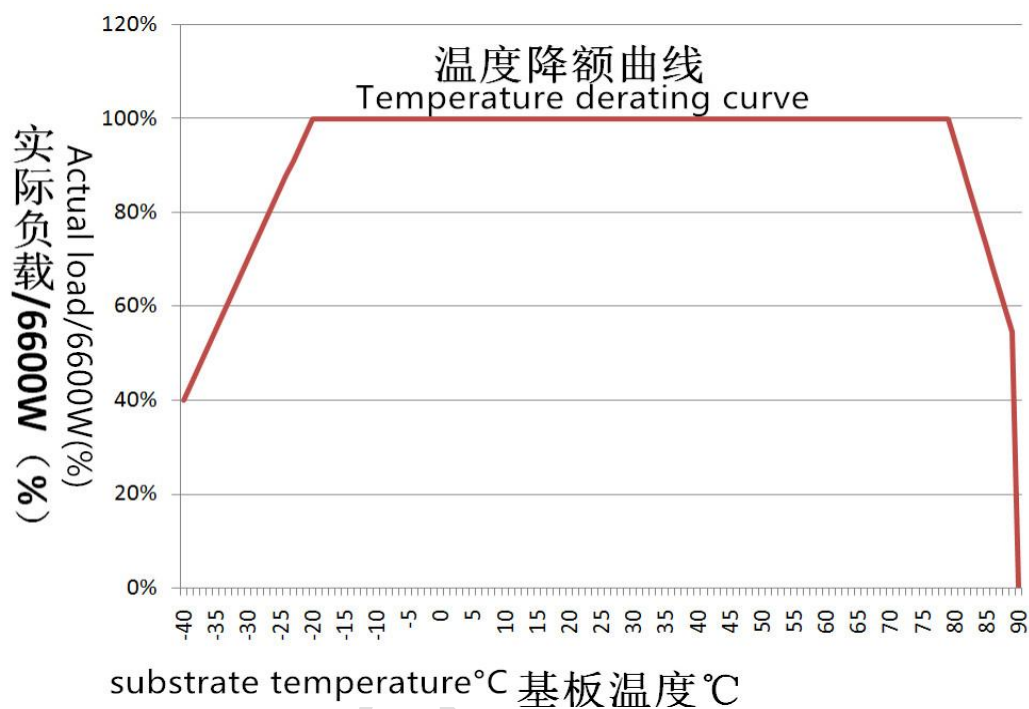
10.1 输入电压降额/Input Voltage Derating

输入电压范围/Input voltage range	85~110Vac	115~175Vac	176~264Vac
输出功率/Output power	2KW MAX	3.3KW MAX	6.6KW MAX

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注：85~265Vac，最大输入电流 32A
 Note: Input voltage 85~265Vac, maximum input current 32A

10.2 温度降额曲线/Temperature Derating Curve




11. 安规标准/Safe Standard

GB4943-2011 IEC60950

12.电磁兼容性/EMC

电磁兼容性/EMC/EMI	引用标准/Reference standard
电磁抗扰性/EMC	GB/T18487.3-2001 中 11.3.1 要求 GB/T18487.3-2001, 11.3.1
电磁干扰性/EMI	GB/T18487.3-2001 中 11.3.2 要求 GB/T18487.3-2001,11.3.2

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13.基本工作环境/Basic Environmental Requirement

工作环境 Working environment	项目 Item	要求 Requirement	备注 Remark
环境温度 Environmental Temperature	工作环境温度 Operating T	-40℃~+90℃(基板温度 80℃ 以上智能降额) (Intelligently derate begin when shell temperature above 80℃)	
	贮存温度 Storage T	-45℃~+95℃	
环境湿度 Environmental Humidity	工作湿度 Operating	<90%RH 不冷凝 (No condensation)	工作环境相对湿度: Operating humidity: 5%~95%
	存储湿度 Storage	<95%RH 不冷凝 (No condensation)	
海拔高度 Altitude height	工作高度 Operating height	0~3000m, 以 2000m 为基础, 海拔每升高 200 m, 规格最高温度降低 1℃ 0~3000m, 2000m as basic, altitude ever increase 200m, standard highest temperature decline 1℃	
	存储高度 Storage height	0~3000m, 以 2000m 为基础, 海拔每升高 200 m, 规格最高温度降低 1℃ 0~3000m, 2000m as basic, altitude ever increase 200m, standard highest temperature decline 1℃	
气压范围 Barometric Range		56.9KPa~106.3Kpa	
冷却方式 Cooling Method		风冷 Air cooled cooled	
耐振动性能 Vibration Resistance		满足 QC/T 895-2011 中 7.8.1 的要求 QC/T 895-2011:7.8.1	
耐冲击性能 Impact Resistance		满足 QC/T 895-2011 中 7.8.2 的要求 QC/T 895-2011:7.8.2	
噪声Noise		满足 QC/T 895-2011 中 7.9 的要求 QC/T 895-2011:7.9	
防盐雾性能 Salt fog Resistance		满足 QC/T 895-2011 中 7.8.5 的要求 QC/T 895-2011:7.8.5	
防水等级 waterproof level		IP66	



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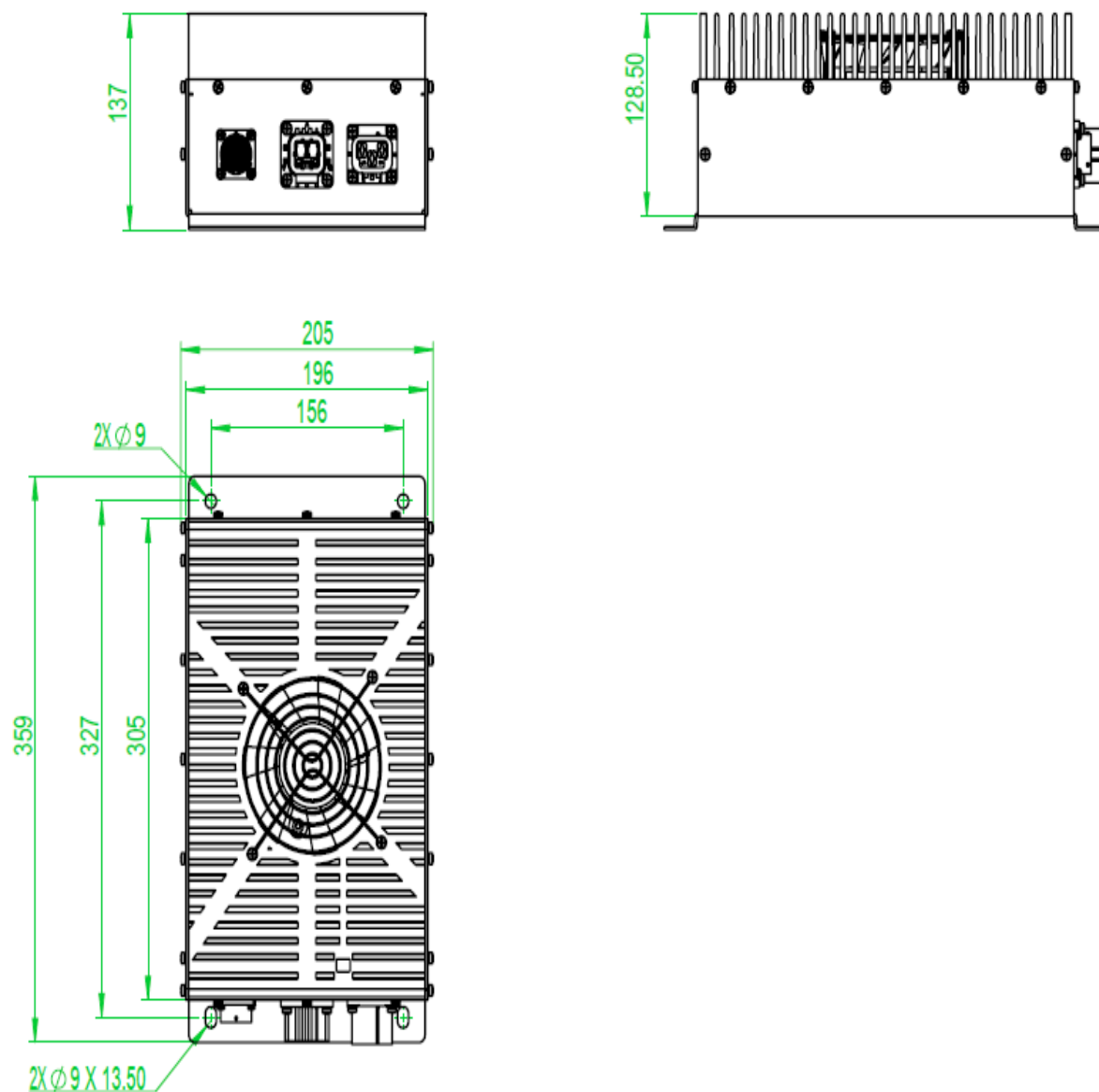
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15.物理尺寸/Dimension/mm

16.重量/Weight

9±0.5kg

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17. 运输与存放/Transport & Store

17.1 储存和保管/Storage

产品的储存和保管应保持 5℃~40℃的清洁、干燥及通风良好的环境。应避免日晒、烘烤、水浸、与腐蚀性物质放在一起。

Storage of the product should be kept in a clean, dry and well ventilated environment of 5℃~40℃. Avoid sun exposure, fire roasting, water immersion, and corrosive substances.

17.2 装卸、运输/Loading and Unloading & Transport

产品在搬运时所受到的冲击和振动应限制在最小程度。

The shock and vibration of the product during handling should be limited to minimum.

18. 其他/Others

项目/Items	要求/Requirement	备注/Note
气味/smell	不产生异味和有害健康的气味 Does not produce harmful odor	/
元器件 Components and parts	所有器件满足降额 All devices meet the derating	/

19. 可靠性&MTBF/Reliability&MTBF


19.1可靠性/Reliability

项目/Items	指标/Index
质量担保期/Warranty	依据双方协议/ According to mutual agreement
使用寿命/Service life	10年@环境温度50℃，每天工作12小时 10 years @ambient temperature 50℃, working 12 hours a day

19.2 MTBF :

3*10⁵h@ 25℃，额定输入，满载输出。

3*10⁵h@ 25℃, rated input, full load output.

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19.3可追溯性

可追溯性的组织方式应确保在出现缺陷时，可随时识别以下特征

Traceability shall be organised in such a way that in the event of a defect the following characteristics can be identified at any time:

- 制造商/Manufacturer
- 生产批次/ Production batch

20.用户指南/User Guide

20.1说明/Guide to Use

本章内容包括如何拆卸包装和便于运输重新包装、最初的检查、使用前的准备以及操作指南等。

This chapter covers how to remove packaging and facilitate transportation, repackaging, initial inspection, preparation before use, and operating instructions.



注意/Attention

- 本电源是一种开关电源，它产生的电磁场可能会影响其他设备的工作，如果设备受到干扰，请使其远离本电源。

The power supply is a switching power supply. The electromagnetic field generated by it may affect the work of other equipment. If the equipment is disturbed, please keep it away from this power supply.



警告/Notice

- 因电源内部即使在断电的情况下也可能有高压，非经过培训的本公司技术人员不得擅自打开机壳。

There may be high voltage in the power supply even in the case of power failure, person who are not trained can not open the shell without permission.

- 本电源在使用时要确保机壳通过 FG 端子良好接地。

The power supply should ensure that the shell is well grounded through FG terminal when used.

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20.2 拆卸包装和重新包装/Disassemble Packing and Repacking

拆卸包装时螺丝刀等工具划开包装的纸箱，取出内部的包装材料，把电源取出，拆下的包装箱及包装材料要注意保存，以便于以后的运输。

When disassemble the packaging using screwdriver tools to open the packing carton, remove the internal packaging materials, take out charger. Preserve the packaging materials for future transportation.

20.3 初次使用前的检查/Checking before First Use



从包装箱里拿出电源，首先对照装箱清单检查物品是否齐全，其次检查电源的外形是否有磕碰或挤压变形等情况，检查输入输出连接器等有无扭曲变形等异常情况，检查有无划伤扭曲变形损坏等情况，如有损伤请立即联系运输单位并通知迪龙营销中心。


Take power supply from the package carton box, firstly check the goods against the packing list is complete or not; then check if there is power supply form is bump or extrusion deformation on the surface of the charger; thirdly check the input and output connectors are distorted, etc.; lastly check whether there are scratches, distortion, deformation and damage. Any abnormal occurs please contact the shipping company immediately, and inform the sales department of Dilong New Energy Technology.

20.4 对交流电源的要求/Request for AC



本电源要求单相交流电源，电压范围为 85Vac~264Vac，交流电源频率为 47~63Hz。要保证在重载情况下加到本电源交流输入的电压不要跌落到所允许的电压范围之外。

This power supply requires a 1-phase AC power supply, voltage range is 85Vac~264Vac, and AC power frequency is 47~63Hz. Make sure that the voltage added to the AC input of this power supply does not fall outside the allowable voltage range under heavy load.

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20.5 交流电源的连接/AC power Connection



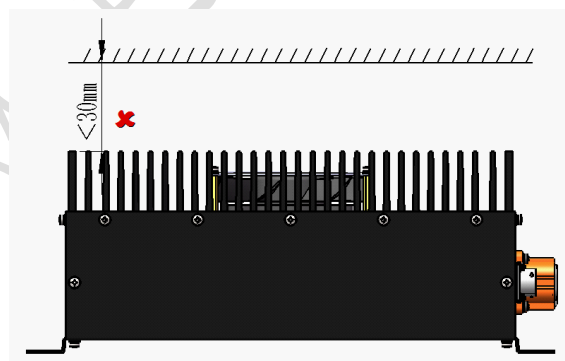
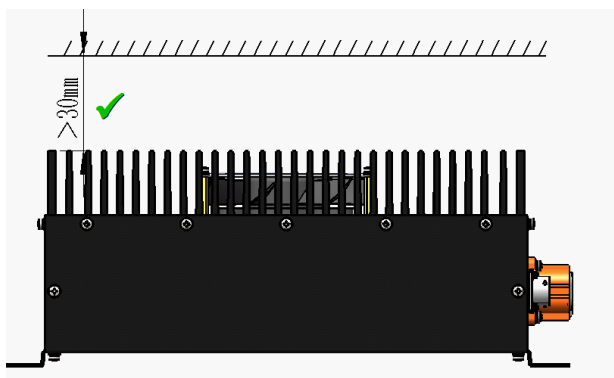
本电源 AC 输入应该通过一个额定电流 64A 并具有保护装置（如空气开关，保险等）的设备连接交流电源。

AC input of the charger shall be connected to the AC power through a device with rated current 64A and protective devices (such as air switches, fuses, etc.).

20.6 设备安装方式/Equipment installation method

本电源可以安装在一个散热平面上使用，安装要牢固可靠。在本电源的周围要留出一定空间。

The power supply can be installed on a heat dissipation surface and the installation should be firm and reliable..Leave some space around the power supply.




20.7 安装力矩/Installation Moment

安装时依据螺钉大小、连接方式等，使用合适的力矩进行安装，参照下表：

When installation please apply suitable torque based on bolt screw and connection way, reference below table:

螺钉/Screw	力矩/Torque
M8	120kgf.cm
M10	240kgf.cm

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20.8安装前注意事项/Precautions before installation

危险/DANGER



高压危险！ / High voltage! Danger to life!

- 1) 如果电源被激活，连接的高压电缆携带高压！因此，在未确保机组未通电的情况下，切勿连接电缆！

If the power supply is activated, connected HV cables carry high voltage! For this reason, never connect HV cables without ensuring that the unit is not live!

- 2) 如果电源在用，高压电缆携带高压！在任何情况下，在没有首先确保高压系统中没有电压的情况下，都不能对设备进行工作！

If the power supply is under operation, HV cables carry high voltage! Under no circumstances carryout work on the device without first ensuring that there is no voltage in the HV system!

- 3) 断开电源和直流连接后，电源需要大约 2min 将电容器放电。在进行进一步的工作之前，必须始终遵守这个时间段，以避免触电！

After disconnecting the power supply and DC connections, the charger requires approx. 2minutes to discharge its capacitors. This time period must always be observed before carrying out further work, in order to avoid electrical shocks!

警告/WARNING

- 1) 在将设备吊出时，如果吊运设备操作不当，可能会坠落！

When lifting the device out, it may fall down if the lifting equipment does not operate properly!


- 2) 未经适当培训，请勿操作起重设备！

Do not operate lifting equipment without having received appropriate training!

- 3) 一定要小心行事，避免抽搐动作！

Always act carefully and avoid jerking movements!

- 4) 使用产品前请注意 20. 用户指南部分。不正确的操作可能导致电源电击受损或引起火灾。

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Please pay attention to the part of 20.User Guide before using the product.

Improperoperation may result in damage to the power supply or fire.

信息/INFORMATION

在安装之前，目视检查包装材料，特别是设备本身是否有损坏。每台设备销售前都经过严格的质量和功能测试。但是，我们对我们产品的搬运没有任何影响。Prior to installation, visually check the packing material and particularly the device itself for damage. Each device undergoes a strict quality and function test before distribution. However, we do not have any influence on shipping and loading of our products.

20.9 安装/启动/Installation/ Start-up

1) 断开高压电源, 确保高压系统不带电。

Disconnect the HV supply, Ensure that the HV system is not live.

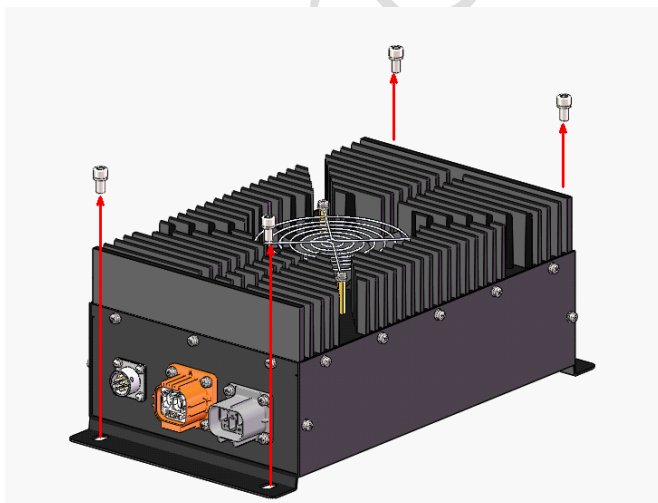
2) 使用适当的设备将电源从包装中取出。


Take out the power supply from package using proper equipment.

3) 小心地将充电器安装在其安装位置，紧固螺钉 M10*15。（扭矩 240 kgf.cm）

Carefully install the charger at its installation location，Fasten screws specification

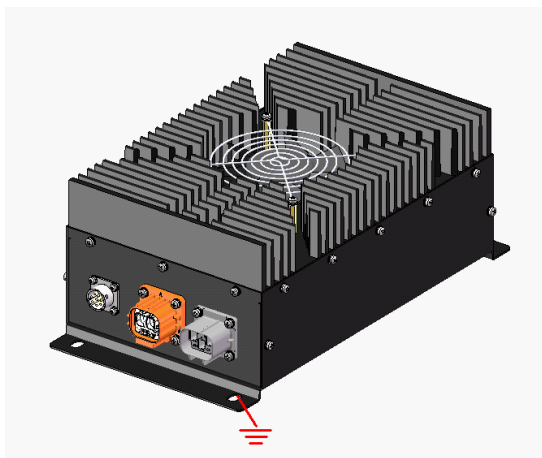
M10*15 .(Torque = 240 kgf.cm)



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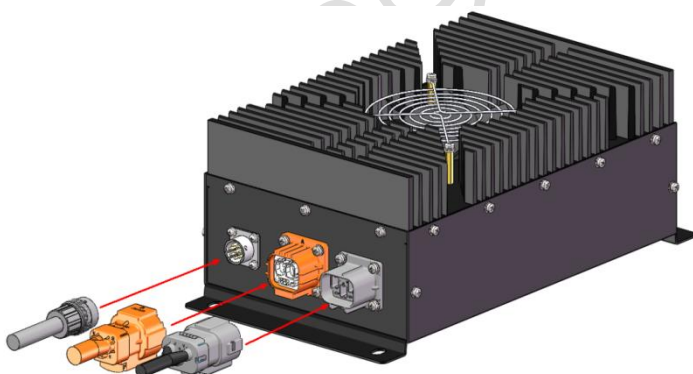
6) 建立机箱接地连接, 电源有一根接地线, 必须连接一个接地连接器。(M8 螺钉扭矩 120 kgf.cm)

Establish earth connection to the chassis. The charger is equipped with a earth connection, and one earth connector must be connected.(M8 screw torque =120 kgf.cm)



7) 将连接插头连接到电源上, 手动检查插头是否紧固。


Connect the plugs to the charger. Manually check if the plugs are fastened securely.



20.10 拆卸电源/Disconnect the connection of charger

1) 断开高压电源 。确保高压系统不带电！



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Disconnect the HV power supply. Ensure that the HV system is not live!

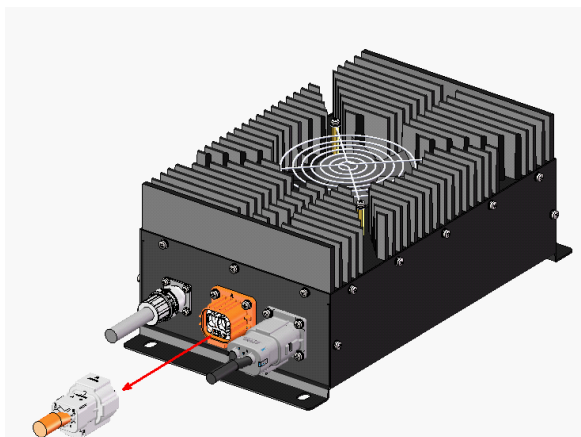
2) 确保系统不被其他人员重新启动！

Ensure the system will not be restarted by other personnel!



3) 从电源上断开直流插头。

Disconnect the DC plug from the charger.



4) 断开电源插头。

Disconnect the power supply plug.



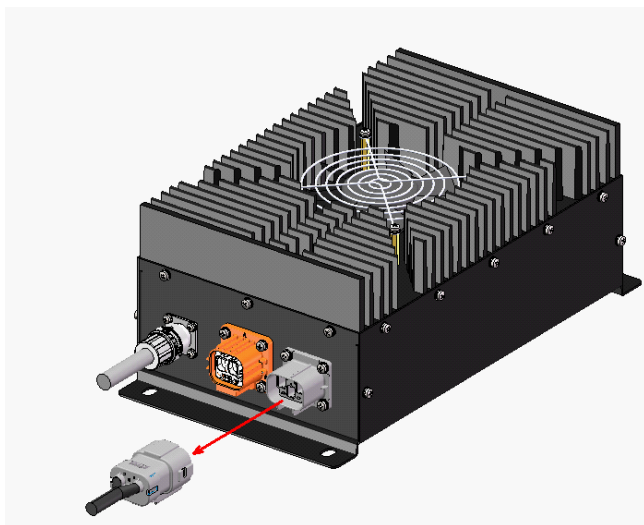
5) 请至少等待 120 秒再执行以下操作（电容器放电）。

Wait at least 120 seconds before performing the following steps (Capacitors need discharged) .



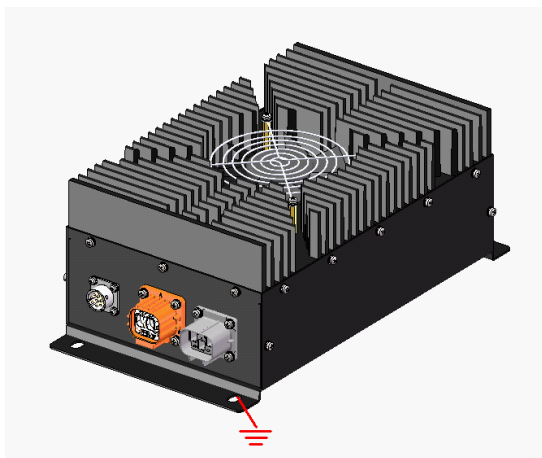
6) 从电源上断开插头。

Disconnect the plugs from the charger.



7) 断开充电器的接地连接。

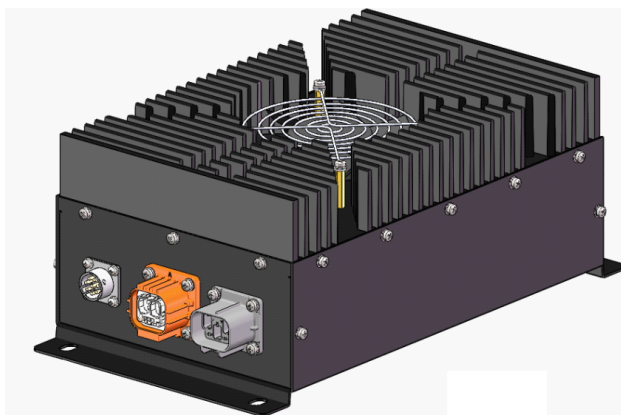
Disconnect the earth connection from the charger.



10) 拆除所有连接到充电器的电缆。确保与充电器的所有连接都已断开，并且没有任何连接。

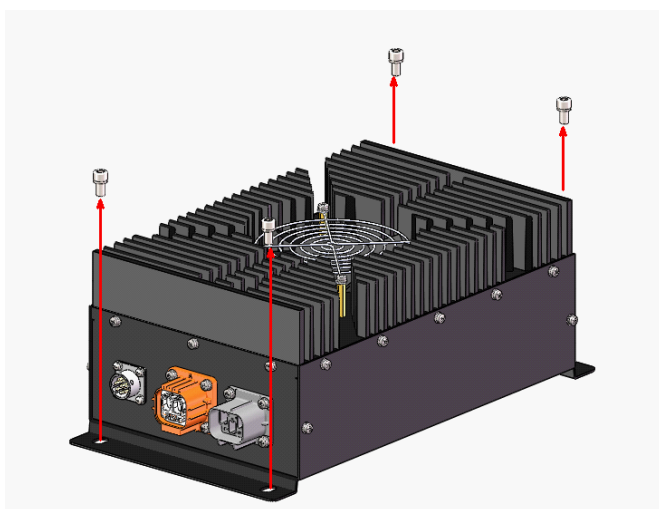
Remove all cables attached to the charger

Ensure that all connections have been disconnected from the power and no connections remain.



11) 拧下螺钉（如果在充电器安装过程中使用 了特定的安装板，则必须将其适当拆除）。


Unscrew the screws(If specific mounting plates are used during the installation of the charger, they must be removed appropriately).



12) 使用适当的设备将电源从其安装位置抬起。

电源重量= 9 公斤

Use appropriate equipment to lift the charger out of its installation location. Charger weight=9kg

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13) 如果设备要送到厂家进行维修，请务必使用合适的包装。

If the device is to be sent to manufacturer for repair, please use appropriate packaging.

20.11使用前的准备/Preparation before Use

本电源正常工作需要连接合适的交流电源，交流电源的电压必须在输入电压范围之内，在阅读本章的 20.4 和 20.12 条之前先不要加电。

This power supply work correctly needing to connect to suitable AC power, AC power voltage must be in the allowed range; do not add to AC power before reading this chapter, the article 20.4 and 20.12.

请按表 20-1 的步骤做好加电之前的准备工作。

Please do the preparation work before connecting to AC power according to the procedure in table 20-1.

表 20-1 加电前需要做的准备工作

Table 20-1 preparations work before connecting to AC power

步骤 Step	项目/Item	内容/Content	参阅 Reference
1	检查/Inspect	外观检查/Appearance inspection	20.3
2	安装 Installation	电源的前后上下应留出足够的通风空间 There should be enough ventilation space around the power supply	20.6/20.9
3	连接 交流电源 Connect to AC power	把本电源连接到规定的交流电源 Connect the charger to the specified AC power	20.5
4	测试/Test	开机测试/Power on test	20.12

20.12 开机测试/Power On Test

进行下面的测试以确保电源工作正常：

Perform the following tests to ensure that the power supply is working properly.

1) 确认电源以按 20.4、20.5 条连接交流电源，交流电源处于“关断”的位置，确认电源输出与蓄电池极性连接正确。

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Confirm that the power supply is connected to the AC power according to 20.4 and 20.5 and AC power is in the “OFF” position. Make sure that the power supply output is properly connected to the battery polarity.

2)确认所有插头连线正确无误。

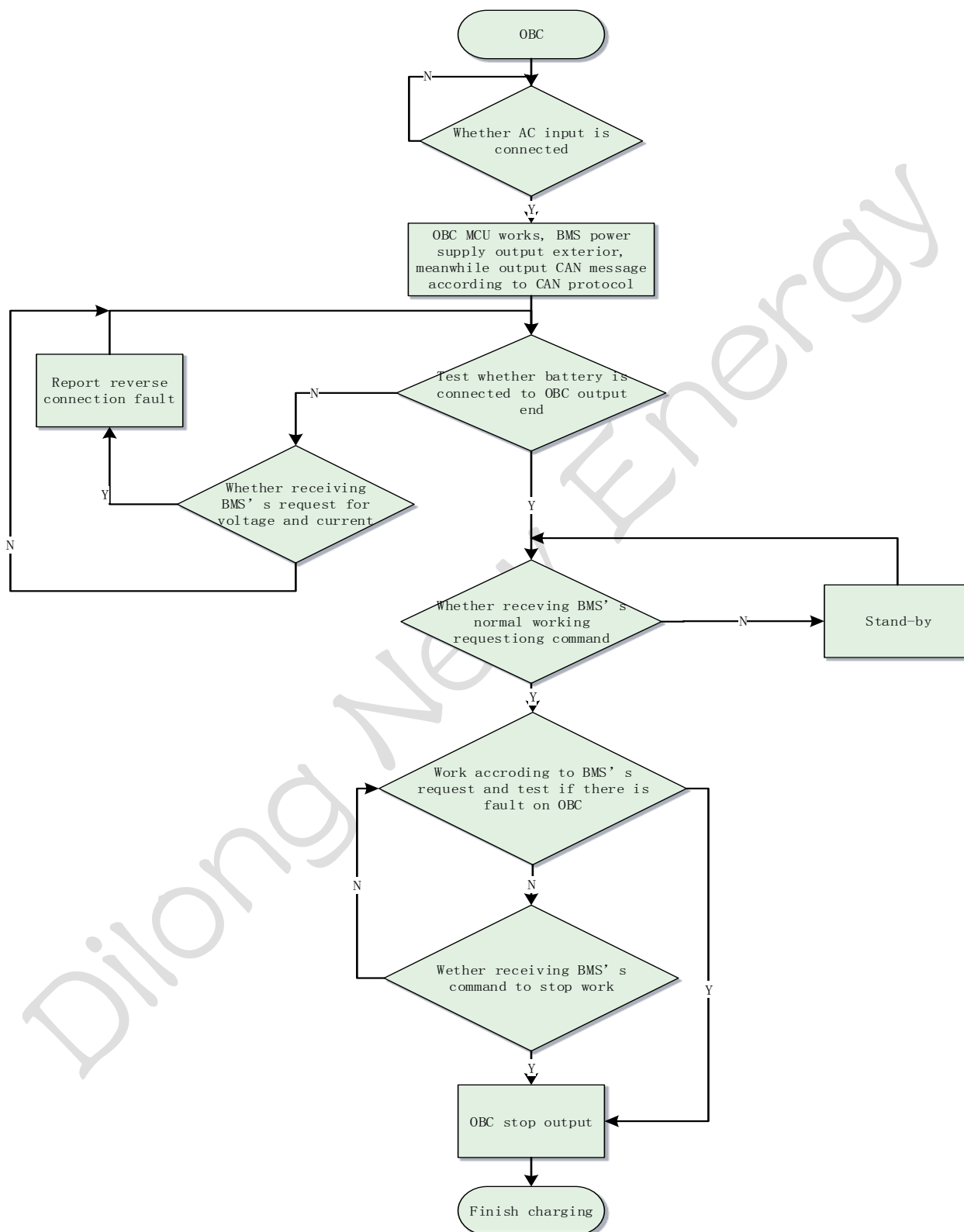
Make sure all the plug connections are correct.

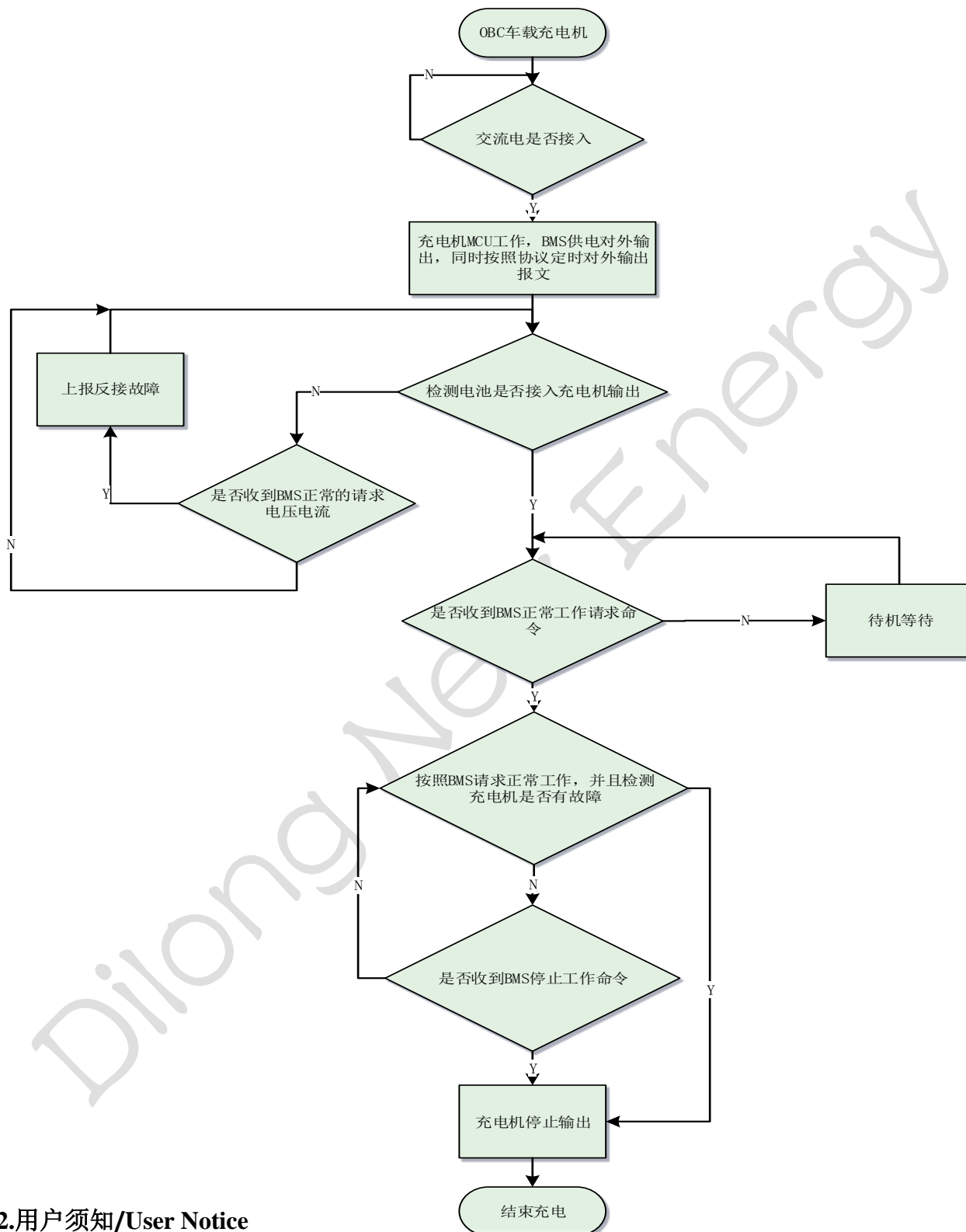
3)打开交流电源的开关。

Turn on the AC power switch.




21.上电流程/Power on process





22.用户须知/User Notice

请在上电前确保插件与对接元件接线无误，接反会瞬间造成无法修复的损坏！

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Please ensure that the mating connectors are connected correctly before power on. The reverse connection will momentarily cause irreparable damage!

OBC 的交流输入端连接导线截面积要大于 6mm^2 ，高压直流输出端连接导线截面积要大于等于 4mm^2 ，辅助电源输出端(BMS 激活)连接导线截面积要大于 0.5mm^2 。CAN 通讯端连接导线应采用屏蔽导线，屏蔽层可靠连接机壳端。

The cross-sectional area of the connecting wire of the AC input end of OBC should be greater than 6mm^2 , the cross-sectional area of the connecting wire of the high-voltage DC output terminal should be greater than 4mm^2 , and the cross-sectional area of the connecting wire of the auxiliary power output terminal (BMS activated) should be greater than 0.5mm^2 . CAN communication terminal connection wire should be shielded wire, and the shielding layer is reliably connected to the casing end.

23.在判定故障之前的确认/Confirm before Fault Determined

在认为电源有故障之前，请确认以下事项：

Please confirm the following items before the power failure is considered:

23.1没有输出电压/No Output Voltage

1)所加输入电压是否在规定范围之内[输入电压是否进入过欠压保护范围]

Whether the input voltage is within the specified range (whether the input voltage is under or under voltage protection).

2)连接的导线极性是否正确，连接有无异常


Whether the connected wire polarity is correct and the connection is abnormal or not.

3) 蓄电池极性是否接反，或电池电压是否过放欠压

Whether the polarity of the battery is reversed, or whether the battery voltage is over-discharged.

23.2过压过流保护/Over Voltage or Over Current Protection

蓄电池有无异常 Whether the battery is abnormal or not

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23.3输出电压低/Low Output Voltage

- 1)连接导线是否过细过长 Whether the connecting wire is too long or too thin.
- 2)连接的蓄电池有无异常 Whether the battery connection is abnormal or not.

23.4输出纹波电压高/Large Output Ripple Voltage

- 1)测定方法是否与应用手册规定的方法相同或等同
Whether the determination methods is same as stated in the manual.
- 2)输出线是否太长
Whether output wire is too long.

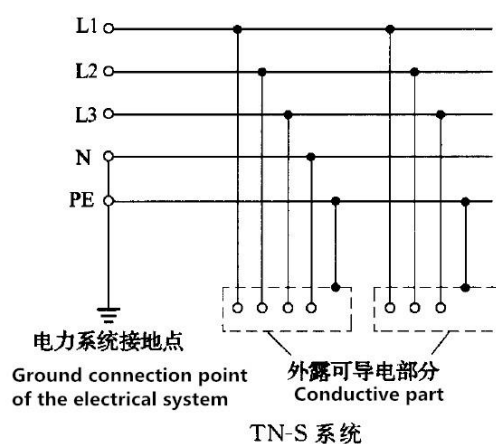
23.5交流输入配电方式注意事项/Precautions for AC input power distribution

符合 GB 50050-2009 要求

Meet the requirements of GB 50050-2009

TN-S 系统。整个系统的 N、PE 线是分开的。

TN-S system. N and PE wire is separate




24.引用标准及规范/Quoted Standard & Rules

QC/T 413-2002 汽车电气设备基本技术条件

GB/T40432-2021 电动汽车用传导式 OBC


GB/T 2423.1-2008 电工电子产品环境试验 第 2 部分：试验方法 试验 A：低温

GB/T 2423.2-2008 电工电子产品环境试验 第 2 部分：试验方法 试验 B：高温

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GB/T 18384.3-2015 电动汽车 安全要求 第 3 部分：人员触电防护
 GB/T 24347-2009 电动汽车 DC/DC 变换器
 GB 4208-2008 外壳防护等级（IP 代码）
 Q/FT B102-2005 车辆产品零部件可追溯性标识规定
 GB/T 2423.3-1993 电工电子产品基本环境试验规程—试验 Ca:恒定湿热试验方法；
 GB/T 2423.4.1993 电工电子产品基本环境试验规程—试验 Db:交变湿热试验方法
 GB/T 2423.5-1995 电工电子产品环境试验，第 2 部分：试验方法/试验 Ea 和导则：冲击
 GB/T 2423.6-1995 电工电子产品环境试验，第 2 部分：试验方法/试验 Ea 和导则：碰撞
 GB/T 2423.8-1995 电工电子产品环境试验，第 2 部分：试验方法/试验 Ed：自由跌落
 GB/T 2423.10-1995 电工电子产品环境试验，第 2 部分：试验方法/试验 Fc 和导则：振动（正弦）
 GB/T 2423.11-1997 电工电子产品环境试验，第 2 部分：试验方法/试验 Fd：宽频带随机振动--般要求
 GB/T 2423.22-2002 电工电子产品环境试验，第 2 部分：试验 N：温度变化
 GB/T 17626.3-2006 电磁兼容 试验和测量技术射频电磁场辐射抗扰度试验
 GB/T 17626.4-2008 电磁兼容 试验和测量技术电快速瞬变脉冲群抗扰度试验
 GB/T 17626.5-2008 电磁兼容 试验和测量技术浪涌（冲击）抗扰度试验
 GB 9254-2008 信息技术设备的无线电骚扰限值和测量方法
 GB/T 17619 1998 机动车电子电器组件的电磁辐射抗扰性限值和测量方法
 GB/T 18655-2010 测量、船和内燃机 无线电骚扰特性用于保护车载接收机的限值和测量方法
 GB/T 18487.1-2015 电动车辆传导充电系统通用要求
 GB/T 18487.2-2001 电动车辆传导充电系统电动车 辆与交流直流电源的连接要求
 GB/T 18487.3-2001 电动车辆传导充电系统电动车辆交流直流 OBC（站）
 GB 14023-2011 车辆、船和由内燃机驱动的装置 无线电骚扰特性 限值和测量方法
 GB/T 18387-2008 电动车辆的电磁场发射强度的限值和测量方法,宽带,9kHz~30MHz
 GB/T 21437.2-2008 道路车辆 由传导和耦合引起的电骚扰 第 2 部分：沿电源线的电瞬态传导
 NB/T 33001-2010 电动汽车非车载传导式 OBC 技术条件
 NB/T33008.1-2013 电动汽车充电设备检验试验规范第 1 部分
 QC/T 895-2011 电动汽车用传导式 OBC
 GB/T 2423.17-2008：电工电子产品环境试验试验 第 2 部分：试验方法 试验 Ka：盐雾
 QSQR E1-5-2012 禁用物质要求
 GB/T 28382-2012 纯电动乘用车 技术条件
 SAE J1939-21:2006 商用车控制系统局域网 CAN 通信协议 第 21 部分：数据链路层

 QC/T 413-2002 Basic technical conditions for automotive electrical equipment
 GB/T40432-2021 Conductive OBC for electric vehicle
 GB/T 2423.1-2008 Environmental testing for electric and electronic products Part 2: Test methods test A: low temperature
 GB/T 2423.2-2008 Environmental testing of electric and electronic products Part 2: Test methods test B: high temperature
 GB/T 18384.3-2015 Safety requirements for electric vehicles Part 3: protection against electric shock
 GB/T 24347-2009 DC / DC converters for electric vehicles
 GB 4208-2008 Enclosure protection class (IP code)

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Q/FT b102-2005 Regulations on traceability identification of vehicle product parts

G/T 2423.3-1993 Basic environmental test procedures for electrical and electronic products -Test CA: constant damp heat test method;

GB/T 2423.4-1993 basic environmental test procedures for electrical and electronic products -Test DB: alternating damp heat test method

GB/T 2423.5-1995 Environmental testing of electric and electronic products, Part 2: Test methods/Test Ea and guidelines: impact

GB/T 2423.6-1995 Environmental testing of electric and electronic products, Part 2: Test methods/Test Ea and guidelines: collision

GB/T 2423.8-1995 Environmental testing of electric and electronic products, Part 2: Test methods/test ED: free fall

GB/T 2423.10-1995 Environmental testing of electric and electronic products, Part 2: Test methods/test FC and guidelines: vibration (sinusoidal)

GB / T 2423.11-1997 Environmental testing of electric and electronic products, Part 2: Test methods/test FD: broadband random vibration - General requirements

GB /T 2423.22-2002 Environmental testing of electrical and electronic products, Part 2: Test N: temperature change

GB/T 17626.3-2006 Electromagnetic compatibility testing and measurement techniques radio frequency electromagnetic field radiation immunity test

GB/T 17626.4-2008 Electromagnetic compatibility testing and measurement technology electrical fast transient burst immunity test

GB/T 17626.5-2008 Electromagnetic compatibility testing and measurement technology surge (impact) immunity test

GB 9254-2008 Radio disturbance limits and measurement methods for information technology equipment

GB/T 17619 1998 Limits and measurement methods for electromagnetic radiation immunity of motor vehicle electronic and electrical components

GB/T 18655-2010 Radio disturbance characteristics of ships and internal combustion engines limits and measurement methods for protecting on-board receivers

GB/T 18487.1-2015 General requirements for conductive charging system of electric vehicles

GB/T 18487.2-2001 Electric vehicle conduction charging system requirements for connection between electric vehicle and AC / DC power supply

GB/T 18487.3-2001 Electric vehicle conduction charging system electric vehicle AC/DC OBC (station)

GB 14023-2011 Limits and measurement methods for radio disturbance characteristics of vehicles, ships and devices driven by internal combustion engines


GB/T 18387-2008 Limits and measurement methods of electromagnetic field emission intensity of electric vehicles, broadband, 9KHz ~ 30MHz

GB/T 21437.2-2008 Road vehicles - Electrical disturbances caused by conduction and coupling - Part 2: Electrical transient conduction along power lines

NB/T 33001-2010 Technical conditions for off board conductive OBC of electric vehicles

NB/T33008.1-2013 Specification for inspection and test of electric vehicle charging equipment Part 1

QC/T 895-2011 Conductive OBC for electric vehicle

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GB/T 2423.17-2008: Environmental tests for electric and electronic products Part 2: Test methods Test Ka: Salt Spray

QSQRE1-5-2012 Requirements for prohibited substances

GB/T 28382-2012 Technical requirements for pure electric passenger cars

SAE J1939-21:2006 Commercial vehicle control system LAN can communication protocol.Part 21 data link layer.

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