韶关比亚迪实业有限公司

BYD（SHAOGUAN） CO.,LTD.

电动叉车充电柜

ELECTRIC FORKLIFT CHARGER

B-CDG80V/200A-II L

使用操作手册

User Manual

欢迎使用本公司充电柜产品，熟读《使用操作手册》令使用者方便、快捷、安全地操作该充电柜。

Welcome to use our charger. Read the "Instructions" so that users can operate the charger conveniently, quickly and safely.

◆ 注意事项/Cautions

本手册提供给使用者安装、操作、故障诊断与排除及日常维护本充电柜相关注意事项，为了确保正确地安装与操作本充电柜，请在装机之前，详细阅读本使用手册，并请妥善保存及交由该机器的使用者。

This manual contains important safety instructions that you must follow during operation and storage.Read the following before any operation to ensure your safety and to keep the charger in the best possible condition.

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◊ 充电柜编号为本公司记录档案代码，用户务必妥善保存，以便我们做好售后服务工作。

Series No. is the company's record file code, users must properly preserve, so that we can do a good job of after-sales service.

◆ 安全标志/Safety Symbols

警告 如果忽略指示，则可能会由于不正确的操作，而造成个人伤害或严重至死亡的说明。必须遵守此符号中的说明进行操作。

WARNING

If symbols are ignored, it may cause personal injury or serious death due to incorrect operation.Follow the instructions in this symbol.

如果忽略指示，则可能会由于不正确的操作，而造成个人伤害或设备损坏的说明，必须遵守此符号中的说明操作。

If symbols are ignored, it may cause personal injury or serious equipment damage to incorrect operation.Follow the instructions in this symbol.

指示出禁止进行的操作，如果操作时不认真，则可能会造成设备损坏，故障或降低产品的质量。

Indicate prohibited operations, if not carefully operated, may cause equipment damage, failure or reduce product quality。

前 言/Preface

本系列产品概括/Summary of this series of products

本系列高频充电柜具有转换效率高、稳压、稳流精度高及瞬态响应指标先进，输出电流波形平滑纹波小，另外由于采用了高频开关技术电源具有省电、容易控制、宽范围可调、体积小重量轻的特点。

This series of high frequency charger has high conversion efficiency, stable voltage, high steady current precision and advanced transient response index, smooth output current waveform and small ripple. In addition, due to the use of high frequency switching technology, the power has the characteristics of power saving, easy control, wide range adjustable, small size and light weight.

性能与技术指标/Performance and Technical Parameters

工作原理概述/Overview of working principle

充电柜主要由整流滤波电路，高频开关逆变电路，ＰＷＭ控制电路，输出整流滤波电路、反接保护、稳压、限压电路，稳流、限流电路，保护电路，以及辅助电源电路等组成。

The charger is mainly composed of a rectifying & filtering circuit, a high-frequency switching conversion circuit, a PWM control circuit, an output rectifying & filtering circuit, a reverse protection circuit, a voltage stabilization & limit circuit,a current stabilization & limit circuit, a protection circuit and an auxiliary power supply circuit.

机械参数/Mechanical Parameters

型号规格 Model NO.	重量(kg) Weight	体积(㎜^{3})长*宽*高 Volume(mm^3)L*D*H	冷却方式 Cooling	适用场合 Working Environment
H-CDG80V/200A-EU	90.2	480×480×780	强迫风冷 Forced Air-cooling	室内 Indoor

电气参数/ Electrical Parameters

（注：输入低电压为额定电压的 85%时，可以满负载输出）

（Note：When the input low voltage is 85% of the rated voltage, it can be output at full load.）

1、输入电压/Input Voltage

额定/Nominal	范围/Range	频率/Frequency
380V AC	323V～437VAC	47～63 Hz

2、额定输出电压/Output Voltage

常规 Routine	源效应 Source Effect	负载效应 Load Effect	启动过冲电压 Start-up Overvoltage
50-87VDC	≤±0.5%	≤±0.5%	≤±5%Ue

3、额定输出电流/Output Current

常规 Routine	电网调整率 Power Regulation Rate	负载调整率 Load Regulation Rate	稳流精度 Stabilized Current Precision
20～200A DC	≤±0.5%	≤±0.5%	≤±1%

4、输出电压稳定度/Output Voltage Stability

电网调整率：不同交流输入电压情况下的直流输出电压与输出电压整定值的差值应不超过输出电压整定值的±0.5%；

Grid Regulation: The variation of DC output voltage is less than ± 0.5% of the nominal output voltage when the AC input voltages changes within 323V-437VAC range.

5、输出电流稳定度/Output Current Stability

当充电柜在额定输出电压范围内使用，输入工作电压变化时，输出电流的变化少于 1%。

When the charging station is working within the nominal output voltage range, the output current varies by less than 1 % as the input operating voltage changes.

6、温漂：0.5%/Temperature drift: 0.5%

7、输出纹波电压/Output ripple voltage

空载到满载纹波有效值：≤额定电压×2%

Effective ripple value from no-load to full-load:≤ nominal voltage × 2 %

8、整机效率/Efficiency

当输出电流是满负载时，整机效率≥92%。

When the output current is full load, the efficiency of the whole machine is more than 92%

9、安全要求/Safety Requirements

9.1 保护功能/Protection Function

输入：过压、欠压、缺相、过流保护；

输出：短路、过流、过压、反接、电流倒灌保护；

整机：温度保护、充电时间保护、通讯保护；

Input : over-voltage , under-voltage , phase-loss , over-current protection ;

Output：short-circuit，over-current，over-voltage，reverse-polarity，reverse-current protection ;

Overall :high temperature , charging time , communication protection.

9.2 介电强度/Dielectric Strength

输入-输出/Input - Output：2500VAC 5mA,1Min

输入-外壳/Input - Housing：2500VAC 5mA,1Min

输出-外壳/Output - Housing：1500VAC 5mA,1Min

9.3 绝缘电阻/Insulation Resistance

输入-输出/Input - Output：DC1000V>200MΩ

输入-外壳/Input - Housing：DC1000V>50MΩ

输出-外壳/Output - Housing：DC1000V>50MΩ

10、逆变频率 Conversion Frequency

18KHz±2KHz（三相全桥 IGBT 模块逆变电路/three-phase full-bridge IGBT module conversion circuit）

11、防护等级/Degree of protection：IP20

12、工作方式/ Operation Methods：

连续工作, 强迫风冷/Continuous operation, forced air cooling

可靠性/Reliability：MTBF>10000h

工作温度/Working temperature：-20℃~60℃

储存温度/Storage temperature：-40℃~60℃

工作噪声/Noise：≤70dB;

安装和使用/Installation and Operation

（安装要求/Installation Requirements）

一、安装使用须知/Installation Instructions

外接线一览表 External wiring

规格型号 Model NO.	导线截面积/Section area of conductor		电源开关 ACB
	输入电源线/Input wire mm^2	输出电源线/Output wire mm^2	
H-CDG80V/200A-EU	3x6+1x4 三相+地线 Three-phase and Ground	70㎜^{2} 以上 Above 70mm^2	63A-4P

二、安装环境要求/Operational Environment

项　目 Item	规　范 Requirement
场所 Place	室外，外部应有防风、避雨、防太阳直射等措施。 Indoor;If outdoor,external measures should be taken to prevent wind, rain and direct sunshine.
周围温度 Temperature	-20℃～60℃；
相对湿度 Relative humidity	10%～90%（不结冰）(no ice)
环境 Environment	不受阳光直照、无灰尘、腐蚀性气体、可燃性气体、油雾、蒸汽、滴水等。不发生温度急剧变化而导致结露 No direct sunlight, no dust, corrosive gas, flammable gas, oil mist, steam, dripping water, etc. No sharp change in temperature resulting in condensation.
间距 Distance	左右两侧须留有 600mm 以上的空间 More than 600mm space around

三、安装注意事项/Installation Attentions

1、 充电柜应水平安装于足够散热空间而且能耐较高温度的材质结构上，勿倒装，斜装。

2、 充电柜运行时要产生热量，为确保冷却空气的通路，且保证充电柜的周围温度不超过规范值。

3、 保证不能有各种纤维、纸片、木片（屑）金属碎块等杂物进入充电柜内，否则可能引发火警。

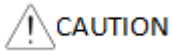
4、 充电枪除非使用，否则应将充电枪帽盖好。

1. The charger cabinet should be installed horizontally on the material structure which has enough heat dissipation space and can withstand higher temperature. Do not flip or skew.

2. When the charger is running, it will generate heat, ensure the passage of cooling air, and ensure that the surrounding temperature of the charger does not exceed the standard value.

3. Ensure that all kinds of fibers, paper, wood chips, metal fragments and other debris can not enter the charger, otherwise fire may be triggered.

4. The charging gun cap should be covered unless used.

四、其他注意事项/Other Attentions  

1、 输出连接参照图表给出的数据，保证接触面导电性良好（光滑无毛刺），用铜螺钉或不锈钢螺钉紧固。

2、 接地端子必须良好接地，可以防止电击或火警事故。

3、 输出插头正负极与负载的正负极要按工艺要求连接。

4、 风机风向为向内吹风。

1. Connect the output according to the data given in the table. Ensure good electrical conductivity of the contact surface (smooth without burrs), fasten with copper screw or stainless steel screw.

2. Grounding terminals must be well grounded to prevent electric shocks or fire accidents.

3. The positive and negative poles of the output plug should be connected with the positive and negative poles of the load according to the technological requirements.

4. The wind direction of the fan is to blow inward.

五、启动检查/Start-up Inspection

1、充电柜通电前,请检查面板各开关,旋钮是否在合适位置。

2、检查电池连线接头是否接好。

3、检查通讯线和 12V 电源线连接正确。

1.Before the charger is powered on, please check the position of switches and knobs on the panel.

2.Check battery connection.

3.Check the connection of communication line and 12V power line

六、使用方法/Operation

显示面板/Display panel

1、将输入空气开关合上，显示面板指示灯点亮。关机灯亮，BMS 通讯灯应按 1S 的频率闪动。风机向内吹风。

2、按下启动按钮，充电柜开始充电，电流缓慢上升。

3、充满后，充电柜自动关闭。风机延时 3 分钟停止转动。

1. Close the air switch and the indicator light of the display panel is on."OFF" light is on, "BMS NET" light flashes at a frequency of 1 second. The fan blows inward

2. Press the "Start up" button, the charger begins to charge, and the current rises slowly.

3. After filling, the charger closes automatically. The fan stops running after a delay of 3

minutes.

七、保护/Protection 注意 CAUTION

1. 输入保护：过压；欠压；过流；缺相保护。

2. 输出保护：短路；过流；过压；反接；电流倒灌保护。

3. 其它：过热；

4. 保护动作

4. 1 一般性保护：可自动恢复，如过压，欠压，缺相，过热 ，输出过流

4. 2 内置保护：电流倒灌，

4. 3 不可自恢复保护：输入过流，输出短路, 输出过压；

5. 不可恢复保护时，将断开输入及输出所有开关;其它保护时，只停止控制部分输出。

6. 过热保护时，只停止控制部分工作。

7. 充电时间保护：从开机开始计时，180 分钟后自动关机。

1. Input : over-voltage , under-voltage , phase-loss , over-current protection ;

2. Output : short-circuit , over-current , over-voltage , reverse-polarity , reverse-current protection ;

3. Others :overheating protection.

4. Protective actions

4.1 General protection:automatic recovery,such as over-voltage , under-voltage , phase-loss , output over-current protection and overheating protection.

4.2 Built-in protection:reverse-current protection.

4.3Non-automatic recovery protection:input over-current protection,output short-circuit,output over-voltage;

5. When the protection is non-automatic recovery, all switches of input and output will be disconnected; other protections only stop the output of control part.

6. When overheating protection, only the control part is stopped.

7. Charging time protection: automatically shut down 15 hours after starting up.

八、新增加功能/New Functions

8.1 二代充电枪

8.1.1 加入 CC1 检测

功能：防止在充电过程中，用户直接拔枪，造成充电枪触点打火。

实现：当客户按下枪上锁止按钮时，充电机停止输出，显示故障 C11;

此故障可恢复；

8.1.2 加入电磁锁控制

功能：防止在充电过程中，客户拔出充电枪；

实现：开机前，软件判断无 C11 故障，BMS 通讯正常，开机前先合电磁锁；充电完成后，自动解锁。若出现故障未能自动解锁，可按充电机柜上停止按钮或枪上解锁。

若出现电磁锁故障，显示故障 C13;

8.1.3 加入枪的温度控制/

实现/

a. 高于 85℃时，充电电流逐渐降低至 70%，低于 80℃时恢复正常充电电流;

b. 高于 95℃时，充电电流逐渐降低至 50%，低于 90℃时恢复至 70%，低于 80℃时恢复正常充电电流；

c. 高于 105℃时，充电电流逐渐降低至 30%，低于 100℃时恢复至 50%，低于 90℃时恢复至 70%，低于 80℃时恢复正常充电电流；

d. 高于 115℃，停止充电，显示故障 C12；

8.1.4 加入充电枪温度显示

实现：50℃以下不显示，从 50℃起，间隔 5℃显示，充电枪两个温度分别显示在故障代码 LED 数码管上。若有其他报警，循环显示。

高于 100℃时，百位不显示。

8.1 Second-generation Charging Plug

8.1.1 Add CC1 detection

Function: it can prevent the user from drawing the plug directly during the charging process and causing the contact of the charging plug to ignite

Realization: when the customer presses the lock button of the plug, the charger stops output and displays the error code C11;

This fault is recoverable;

8.1.2 Add electromagnetic lock control

Function: prevent the customer from pulling out the charging plug during the charging process;

Realization: before starting up, the software judges that there is no C11 fault, BMS communication is normal.The electromagnetic lock is closed before starting up; When the charging is completed, it will be unlocked automatically. In case of failure to unlock automatically, press the stop button on the charging cabinet or unlock the plug.

If there is an electromagnetic lock fault, display the error code C13

8.1.3 Add temperature control of plug

Realization：

a. When the temperature is higher than 85° C, the charging current is gradually reduced to 70%, and the normal charging current is restored when the temperature is lower than 80° C;

b. When the temperature is higher than 95 ° C, the charging current is gradually reduced to 50%, when it is lower than 90 ° C, it returns to 70%, and when it is lower than 80 ° C, the normal charging current is restored;

c. When the temperature is higher than 105 °C, the charging current is gradually reduced to 30%, when it is lower than 100 °C, it is restored to 50%, when it is lower than 90 °C, it is restored to 70%, and when it is lower than 80 °C, the normal charging current is restored;

d. Above 115 ° C, stop charging, display the error code C12;

8.1.4 Add charging plug temperature display

Realization: It is not displayed below 50 °C. From 50°C, the interval is 5°C. The two temperatures of the charging plug are displayed on the LED of the error code.It displays cyclically if there is any other alarm.

When it is higher than 100 °C, the hundred digits are not displayed.

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8. 2 预约充电功能

1. 输出与叉车连接好；
2. 合上空气开关，上电；
3. 长按停止按钮 5S 以上，故障代码栏显示 SET
4. 按启动按钮为加，按停止按钮为减，一次 30 分钟
5. 设定好后，进入倒计时。
6. 倒计时结束后，充电机开始充电。

8. 2 Reservation charging

8.2.1 Connect the output plug with forklift truck.

8.2.2 Close the air switch and power on;

8.2.3 Press the “STOP” button more than 5s, and the error code bar shows “SET”.

8.2.4 Press the “START” button to add and the “STOP” button to subtract for 30 minutes at a time.

8.2.5 After setting, enter the countdown.

8.2.6 When the countdown is over, the charger starts charging.

九、充电柜运行故障代码/Error code

所属设备/Equipment	显示值/Code	故障描述/Description
BMS	B 01	电池组过流报警 Over-current of battery pack
	B 02	充电状态下单节电压严重过高报警 Seriously high single-section voltage during charging
	B 03	电压平台异常 Voltage platform anomaly
	B 04	电池电压过低严重报警 Serious alarm of low battery voltage
	B 05	电池组温度严重过高报警 Battery pack temperature is too high
	B 07	电压过高严重告警 Serious alarm of over-voltage
	B 08	电压采样断线告警 Voltage sampling wire break alarm
	B 11	采样系统严重故障 Serious fault of sampling system
充电柜 Charger	C 01	电池未接或接反 Batteries are unconnected or reversed
	C 02	过温/Over-temperature
	C 03	输入过压/Input over-voltage
	C 04	输入欠压/Input under-voltage
	C 05	输入过流/Input over-current
	C 06	输出过压/Output over-voltage
	C 07	输出过流/Output over-current
	C 08	充电柜与 BMS 电流采样偏差过大 Excessive deviation between charger and BMS current sampling

	C 09	充电柜与 BMS 电压采样偏差过大 Excessive deviation between charger and BMS voltage sampling
	C 10	通讯故障/Communication fault
	C 11	充电枪未插好/The plug is not plugged in
	C 12	充电枪温度过高/The plug temperature is too high
	C 13	充电枪电磁锁异常/The plug electric magnetic lock anomaly
	0	无任何故障 No fault

维护与保养/Maintenance

为使充电柜能长期可靠连续运行，防患于未然，应进行日常检查或定期检查，注意以下的项目。

In order to make the charger run reliably and continuously for a long time, and prevent accidents in the future, it is necessary to carry out daily inspection or regular inspection, and pay attention to the following items,

一、日常检查（定期检查）/Daily inspection(regular inspection)

通电运行时不取去外盖，从外部目检充电柜的运行确认没有异常情况。通常检查以下各点：

1、 运行性能符合标准工艺规范；

2、 周围环境符合标准规范（见使用环境表）；

3、 面板仪表显示各功能开关都正常；

4、 没有异常的噪声、振动和气味；

5、 风机是否正常运转；

6、 没有过热或变色等异常情况；

7、 输入电压是否在正常的工作范围；

8、 各连接线接头是否紧固。

When the power is turned on, the outer cover is not removed. The operation of the rectifier is checked from the outside to confirm that there is no abnormal situation. Usually check the following points:

1. The operation performance conforms to the standard process specification.

2. The surrounding Environments conform to standards and norms.(see the table of Operational Environment)

3. The panel display is normal and all function switches are normal.

4. No abnormal noise, vibration and odor.

5. Whether the fan is working properly or not.

6. No abnormal conditions such as overheating or discoloration.

7. Whether the input voltage in the normal range or not.

8. Whether connections are fastened or not.

二、定期保养/Regular maintenance

充电柜每隔 15 天(根据环境状况调整)清理一次入风口端机盖面的沉积物 ，以便入风窗口畅通无阻，保持冷风流量，以利整机散热。

Cleans up the sediment on the cover of the air intake terminal every 15 days (according to the adjustment of environmental conditions), so that the air intake window is unimpeded and the cold air flow is maintained, so as to facilitate the heat dissipation of the whole machine.

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BYD（SHAOGUAN） CO.,LTD.

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