浙江宏舟新能源科技有限公司
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产品规格书

Product Specification

浙江宏舟新能源科技有限公司 2024/1/4 技术文件

文件编号 File No.：4578971GGS008

产品名称 Product Name: 高压直流继电器 HVDC RELAY

产品型号 Product Part NO.: HFZ21-250/1000-B-HA-XX（XXX）

发布日期 Release Date: Jan.5th, 2024

生产工厂 Production Plant: 浙江宏舟新能源科技有限公司
Zhejiang Hongzhou New Energy Technology Co.,Ltd.

版本 Version: a

宏发审批签字 Signature by Hongfa			顾客确认 Customer Approval
拟制 Release by	审核 Checked by	批准 Approved by	负责人 By:
许峰源 2024-01-03 14:02:48	郑增光 2024-01-04 10:04:47 潘 桐 2024-01-04 11:20:43	代文广 2024-01-04 12:20:52	日期 Date:

特别说明：
1.此规格书请顾客在 2 周内确认，如未在规定时间内答复，则视为同意。
2.自提供规格书之日起 2 年内，顾客没有下单订货，本规格书失效。
3.此规格书未经宏舟盖章，视为无效。

Special claim:
1.This specification is expected to be confirmed within 2 weeks.Without feedback after 2 weeks, Hongfa will consider it's approved by the customer automatically.
2.This specification will be invalid if no order within 2 years.
3.This specification is deemed invalid if it is not stamped by Hongfa.

变更履历 Revisions Record

顾客 Customer /		产品型号 Product Part No. HFZ21-250/1000-B-HA-XX（XXX）		
变更版 Version No.	变更日期 Change Date	变更内容 Description	原因 Reason	负责人 By
a	2024.1.3	/	新增 Newly Add	许峰源 Fengyuan Xu

HFZ21-250/1000-B-HA-XX（XXX）规格书

HFZ21-250/1000-B-HA-XX（XXX）Specification

1 线圈额定参数 Coil Rating

at -40 ℃ ～ 85 ℃

额定电压 Rated Voltage Vd.c.	动作电压 Operate Voltage Vd.c.	释放电压 Release Voltage Vd.c.	线圈电阻 Coil Resistance Ω（at 23 ℃）	线圈功耗 Coil Power W（at 23 ℃） 大约 Approx.
9～36	≤9.6	≥5	3.1(1±7%)	启动 Driving：48 保持 Holding：2.5

2 主触点参数 Contact Specification

2.1 触点形式 Contact Arrangement: 一组常开 1H 1 Form A 。

2.2 触点材料 Contact Material: 铜合金 Copper Alloy 。

2.3 接触电阻 Contact Resistance: ≤0.5 mΩ (at 250 A)。

2.4 触点额定负载 Contact Rating: 250 A （120 mm^2 cable）。

2.5 最大分断电流 Max Breaking Current: 2000 A 320 Vd.c. (1op)。

2.6 最大切换电压 Max Switching Voltage: 1000 Vd.c.。

2.7 最小适用负载 Min Applicable Load: 12 Vd.c. 1 A 。

2.8 电流耐受 Current Endurance

电流 Current	时间 Duration
250 A	持续/Cont.
375 A	30 min
500 A	3 min
625 A	2 min

电流耐受条件 Conditions for current endurance

1) 环境温度 Ambient temperature：23 ℃；

2) 线圈激励电压为线圈额定电压 Supply rated voltage to coil；

3) 使用 120 mm^2 线径铜导线连接 The cross section area of wire is 120 mm^2.

3 辅助触点参数 Auxililiary Contact Specification

3.1 触点形式 Contact Arrangement: 一组常开 1H 1 Form A

3.2 触点材料 Contact Material: 铜合金 Copper Alloy

3.3 接触电阻 Contact Resistance: ≤100mΩ(at 1 A &23 ℃)

3.4 触点额定负载 Contact Rating: 6 Vd.c. 0.1 A

4 耐久性 Endurance

4.1 电耐久性 Electrical Endurance

产品型号 Product Part NO.	触点形式 Contact Form	触点负载 Contact Rating	环境温度 Ambient Temperature	通断比 Ratio	电耐久性 Electrical Endurance
HFZ21-250/1000-B-HA-XX（XXX）	一组常开 1H	阻性负载 Resistive Load 分断 Breaking 250A 1000 Vd.c.	常温 Room Temperature	0.6 s：5.4 s	1×10^3次 (ops)

4.2 机械耐久性 Mechanical Endurance

触点形式 Contact form	触点负载 Contact Rating	环境温度 Ambient Temperature	通断比 Ratio	机械耐久性 Mechanical Endurance
一组常开 1H	无负载 No load	常温 Room Temperature	0.5 s:0.5 s	2×10^5 次（ops）

5 绝缘电阻 Insulation Resistance

5.1 试验前 Before Test

断开主触点电路的各引出端之间

Between open main contacts:1000 MΩ (1000 Vd.c.)

主触点引出端与线圈引出端之间

Between main contacts and coil:1000 MΩ (1000 Vd.c.)

主触点与辅助触点引出端之间

Between main contacts and Auxiliary contact:1000 MΩ (1000 Vd.c.)

5.2 试验后 After Test

断开主触点电路的各引出端之间

Between open main contacts:50 MΩ (1000 Vd.c.)

主触点引出端与线圈引出端之间

Between main contacts and coil:50 MΩ (1000 Vd.c.)

主触点与辅助触点引出端之间

Between main contacts and Auxiliary contact:50 MΩ (1000 Vd.c.)

6 介质耐电压 Dielectric Strength（漏电流 Leakage Current:≤1 mA ）

6.1 试验前 Before Test

断开主触点电路的各引出端之间

Between open main contacts: 3500 Va.c.1 min 或≥3850Va.c.1 s

主触点引出端与线圈引出端之间

Between main contacts and coil: 3500 Va.c.1 min 或≥3850Va.c.1 s

主触点与辅助触点引出端之间

Between main contacts and Auxiliary contact: 3500 Va.c.1 min 或≥3850Va.c.1 s

6.2 试验后 After Test

断开主触点电路的各引出端之间

Between open main contacts: 2625 Va.c.1 min 或≥2887Va.c.1 s

主触点引出端与线圈引出端之间

Between main contacts and coil: 2625 Va.c.1 min 或≥2887Va.c.1 s

主触点与辅助触点引出端之间

Between main contacts and Auxiliary contact: 2625 Va.c.1 min 或≥2887Va.c.1 s

7 时间参数 Time Parameters(额定电压下 At Coil Rated Voltage)

7.1 动作时间 Operate Time: ≤30 ms。

7.2 释放时间 Release Time: ≤10 ms。

7.3 回跳时间 Bounce Time: ≤5 ms。

8 振动 Vibration

正弦振动,1.5 mm 双振幅，10 Hz～500 Hz，加速度 49 m/s^2,三个相互垂直轴线的每一个方向 8 h（激励和非激励各 4 h）,共 24 h。继电器外观、结构和性能不应有异常。Sinusoidal vibration，1.5 mm double amplitude ,10 Hz to 500 Hz, acceleration 49 m/s^2, 8 hours each for every axis,4 hours each for the energized and non-energized status ,total 24 hours. There shall not be any abnormalities on relay appearance, construction and performance.

9 冲击 Shock

9.1 稳定性 Functional

98 m/s^2（脉冲持续时间 11 ms），36 次(三个相互垂直轴线的每一个方向 6 次，激励和非激励各 3 次),闭合回路的断开或开路回路的闭合时间应不超过 10 μs。98 m/s^2,duration 11ms, 6 ops for each direction of three mutually perpendicular axes, 3 ops each for the energized and non-energized status, total 36 shocks. The opening time for close contacts or the closing time for open contacts should not exceed 10μs.

9.2 强度 Destructive

490 m/s^2（脉冲持续时间 6 ms），300 次(三个相互垂直轴线的每一个方向 50 次) 继电器外观、结构和性能不应有异常。490 m/s^2,duration 6 ms, 50 shocks for each directions of three mutually perpendicular axes,total 300 shocks .There shall not be any abnormalities on relay appearance, construction and performance.

10 标准测试条件 Standard Test Conditions

10.1 温度 Temperature: 23 ℃±5 ℃。

10.2 湿度 Humidity: 5 %～95% RH。

10.3 方向 Direction of Measurement: 立式 Vertical 。

11 使用环境条件 Operate Ambient Conditions

11.1 环境温度 Ambient Temperature: -40 ℃ ～ 85 ℃ 。

11.2 环境湿度 Ambient Humidity: 25 %～75% RH 。

11.3 安装方向 Mounting Direction: 立式 Vertical 。

注：使用环境条件不能导致继电器内部产生结露、结冰，否则会导致继电器失效。

Note:The ambient environment of application shall not cause any dewing or icing inside the relay. Otherwise, the relay may not work properly.

12 贮存条件 Storage Conditions

12.1 温度 Temperature: 0℃ ～ 40℃

12.2 湿度 Humidity:5%～85% RH

12.3 贮存期 Storage Life: 12 个月 12 Months。(原包装 Original Package)

12.4 环境 Environment

12.4.1 产品贮存场地不能有腐蚀性气体。 Store in locations where the product is not exposed to corrosive gas.

12.4.2 贮存中应避免阳光直照产品。 Keep product is not exposed to the direct ray of the sun.

13 订货标记 Ordering Information

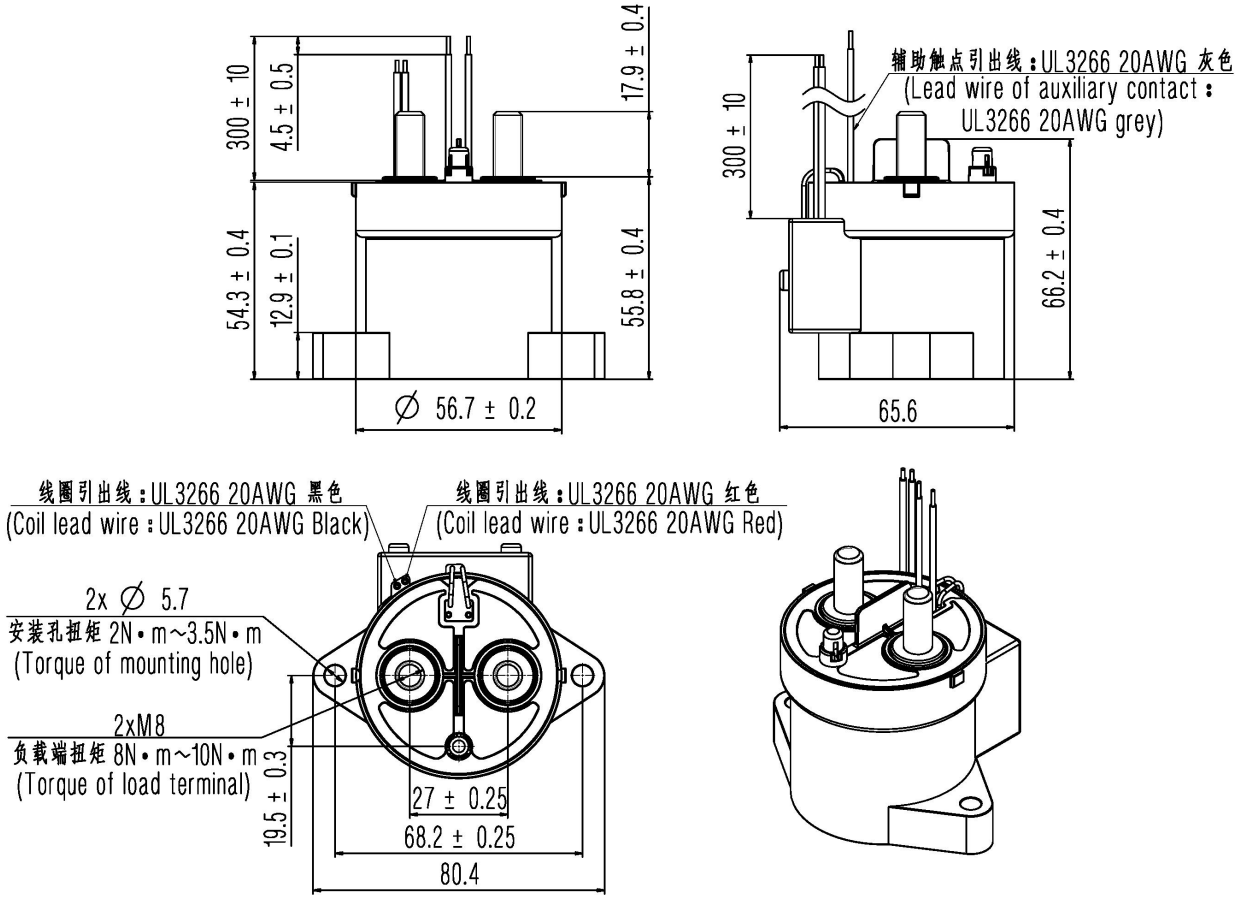
HFZ21 - 250 / 1000 - B - H A - X X （XXX）
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	产品型号 Product Part NO.	HFZ21
②	系列代号 Series Code	250：250 A
③	负载电压 Load Voltage	1000：1000 Vd.c.
④	线圈电压 Coil Voltage	B：9～36 Vd.c.
⑤	触点形式 Contact Form	H：一组常开 1 Form A
⑥	辅助触点形式 Aux Form	A：一组常开 1 Form A
⑦	线圈引出形式 Coil Termination	L：引出线 Lead Wire B：带连接器引出线（连接器型号由客户提供） lead wire with connector（connector is provided by customer）
⑧	负载引出形式 Load Termination	4: 外螺纹 External Thread 5: 内螺纹 Internal Thread
⑨	特性号 Suffix Code	XXX：特性号 Suffix Code

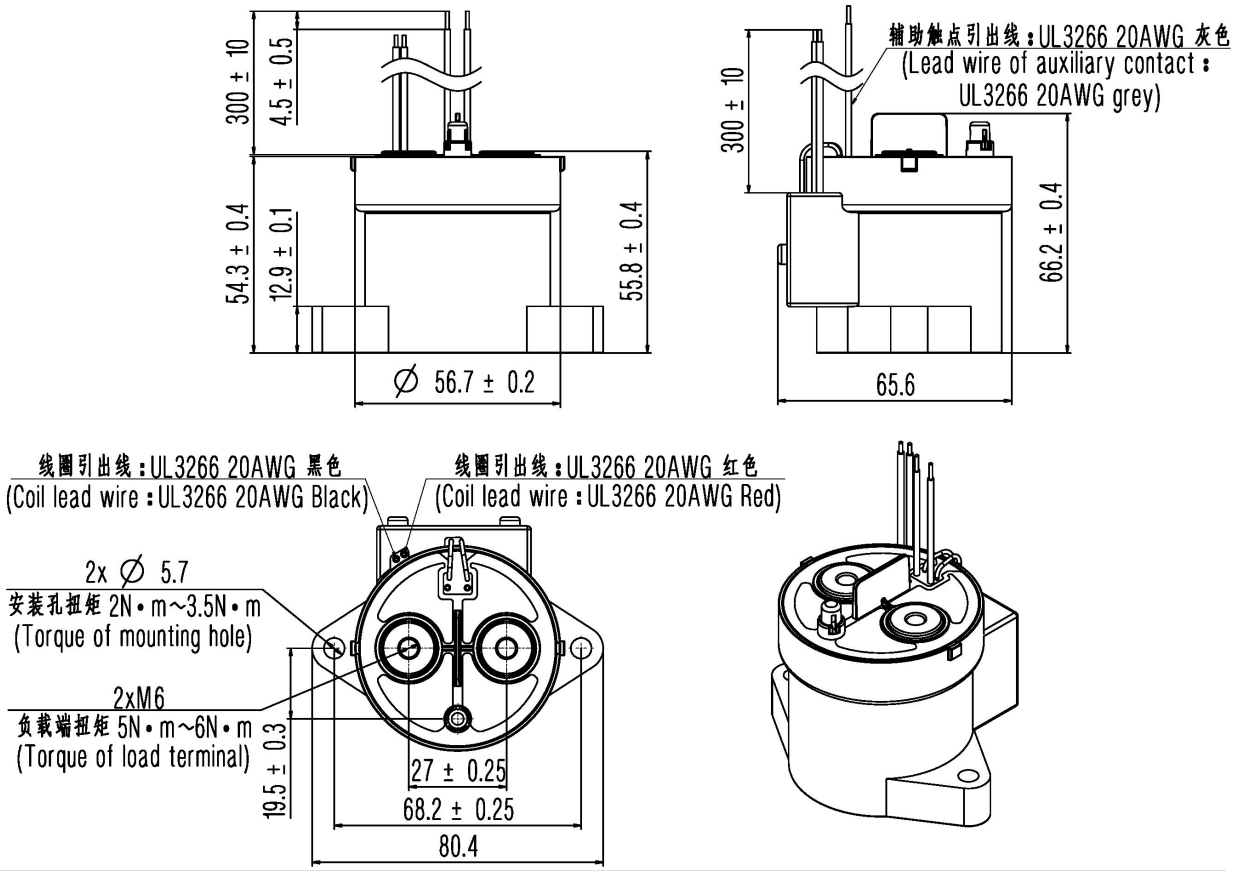
14 产品结构 Configuration

14.1 外形图 Outline Dimensions:

外螺纹产品 External Thread Product:

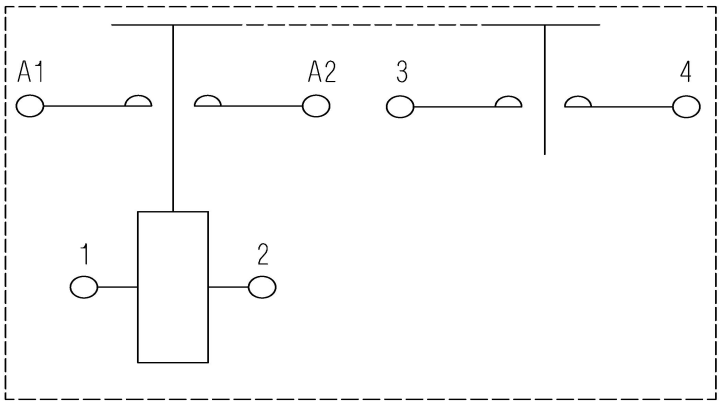


内螺纹产品 Internal Thread Product：



产品型号 Product model	重量 Unit Weight
HFZ21-250/1000-B-HA-L4（XXX）	380×（1±7%）g
HFZ21-250/1000-B-HA-L5（XXX）	360×（1±7%）g

14.2 接线图 Wiring Diagram



注 1：A1、A2 为负载端，无极性； No polarity on the load A1 and A2；1、2 为线圈端，无极性 No polarity on the coil 1 and 2；3、4 为辅助触点端，无极性；No polarity on the auxiliary contact 3 and 4。

注2：产品外形尺寸未注尺寸公差按下表执行。

Note: All unspecified tolerance please refer to the following table.

产品外形尺寸未注尺寸公差 Outline dimensions with no specified tolerance mm	
外形尺寸 Outline Dimensions	公差 Tolerance
≤1	±0.2
＞1～5	±0.3
＞5	±0.4

15 其他说明 Others

15.1 供应商 Supplier

浙江宏舟新能源科技有限公司 Zhejiang Hongzhou New Energy Technology Co., Ltd.

15.2 规格书内的各项性能参数是基于标准测试条件下测得的初始值。All the performance data listed in the datasheet are the initial values tested under standard testing condition.

15.3 注意事项 Notes

15.3.1 对宏舟而言，不可能评定继电器在每个具体应用领域的所有性能参数要求，因而客户应根据具体的使用条件选择与之相匹配的产品，若有疑问，请与宏舟联系，以便获取更多的技术支持；但产品选型责任仅由客户负责。Hongzhou could not evaluate all the performance and all the parameters for every potential application. The customer can choose the right product according to the specific usage conditions and requirements.If there is any queries, please contact Hongzhou for the technical service. However, customer will responsible for what they choose and it is the user's responsibility to determine which product should be used.

15.3.2 我司承诺的负载,在没有特别说明时，均指额定负载，产品使用于我们承诺的负载条件之外时，我公司不承担因此造成的失效责任。Without special note ,the load we commit to the load is the rating load .Hongzhou doesn't response for any usage beyond our guarantee.

15.3.3 触点额定值均为阻性负载时的数值，使用 L/R≥1ms 的感性负载（L 负载）的情况下，请与感性负载并行采取浪涌吸收措施。未采取措施的情况下，可能会造成电气寿命下降、发生切断不良。The rating load of contact is resistive load. Please assure a surge absorption device together with inductive load when using the L/R≥1ms inductive load (L Load),otherwise it may lead to the decrease of electrical endurance and defective switch.

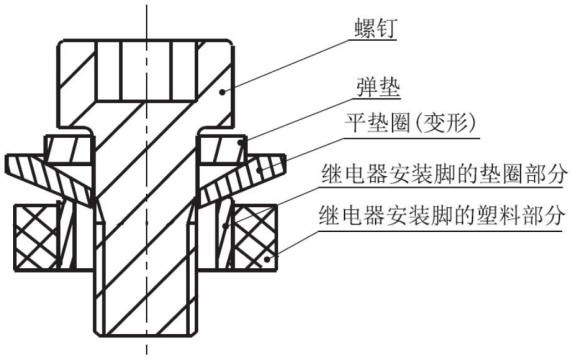
15.3.4 本继电器的内部触点使用了气体保护，伴随着触点温度变化（环境温度+通电致使温度上升）而存在内部气体穿透，严禁将继电器长时间置于超过产品温度使用范围（-40 ℃～85 ℃）环境中。The relay contacts are sealed and filled with gas. When the contact temperature changes, there is internal gas penetrating

characteristic.Hongfa relays are forbidden to be used at the temperature beyond our suggestion -40 ℃～85 ℃ for long time.

15.3.5 请避免在强磁界（变压器、磁铁的周围）和发热物体的附近安装。Please avoid installation in strong magnetic field(around the transformers & the magnet)and the heating objects nearby.

15.3.6 为防止出现松动，继电器安装时请使用垫圈。继电器安装处请使用 M5 螺钉，螺钉锁紧扭矩请控制在 2 N•m～3.5 N•m;负载端安装处的螺钉锁紧扭矩请控制在 5 N•m ～6 N•m/8 N•m ～10 N•m，在超过范围的情况下，可能会造成破损。In order to prevent loosening, please use the washer when installing the relay. Please use the M5 screws to install relay, screw locking torque within 2 N•m～3.5 N•m; Make sure the lock nut torque of the terminal installation is within 5 N•m ～6 N•m/8 N•m ～10 N•m. Damage may occur when it is beyond the range.

15.3.7 使用 M5 螺钉时，确保垫圈厚度和强度足够，否则会变形，撑破外壳。When use M5 screw, make sure the washer's thickness and strength are enough. Otherwise it will be out of shape, and the case will be broke.



15.3.8 请避免在引出片上粘附油脂等异物，请使用 120 mm^2 以上规格的连接导线，否则有可能会造成引出端部分的异常发热。Please avoid grease and other foreign matter in the terminal, please use the connecting wire with a cross section area ≥ 120 mm^2,or they may cause overheating to the terminal part .

15.3.9 注意连接铜排的厚度和扭矩大小，若超出下表建议的数值，会造成螺纹滑牙或安装不紧的问题。不建议将两铜排安装在同一侧，避免高压短路或打火。Please pay attention to the thickness of copper bars and the value of the torque. If it goes beyond the recommended values in the below table , it will cause thread slide or installation is not tight.To avoid short circuit or fire,it's not suggest fix two copper bus bar at same side.

负载引出端螺钉大小 screw on load terminal	建议铜排厚度 the thickness of copper bus bar	扭矩大小 Torque
内螺纹 M6 Internal Thread M6	4 mm	5 N•m ～ 6 N•m
外螺纹 M8 External Thread M8	4 mm	8 N•m ～ 10 N•m

15.3.10 在继电器坠落的情况下，原则上请不要再使用。In principle, please do not use it when the relay has fallen down.

15.3.11 请确保在继电器周围不存在硅系物质（如硅橡胶、硅油、硅系涂料剂、硅填充剂等），因为它们会产生含硅挥发气体，可能导致硅附着于继电器触点上，引起触点接触不良。Please make sure that there is no silicon material around relay (Such as silicon rubber, silicon oil, silicon coating agent, silicon filler, etc), because silicon material produces silicon-containing volatile gases,silicon may be attached to relay contacts and result in bad contact.

15.3.12 继电器焊接后，不允许水洗。Water washing is not allowed after welding.

15.3.13 环保措施 Environmental Protection

宏舟产品均符合 RoHS 要求。Hongzhou products are all RoHS compliant.

15.3.14 宏舟保留对产品更改的权利，客户在首次下单之前应确认此规格书内容，必要时可要求我司提供新的规格书。Hongzhou reserves the right to make changes.Customers should reconfirm the contents of the specification before first orders and ask for us to supply a new specification if necessary.