



## 浙江库客安电器科技有限公司

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## 产品规格书

## Specification

文件编号 File No.: GGS-HY-017

产品名称 Product Name: 直流接触器 DC Contactor

产品型号 Product model: KHFEVC-HY400 系列产品

发布日期 Publish Date: 2024.07.06

生产工厂 Production Plant: 浙江库客安电气科技有限公司  
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版本 Version: A3

| 库客安审批签字 Signature by KKA |             |                | 顾客确认<br>Custom Approval |
|--------------------------|-------------|----------------|-------------------------|
| 拟制<br>Make               | 审核<br>Check | 批准<br>Approved | 负责人 By:                 |
|                          |             |                | 日期 Date:                |

## 特别说明:

- 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。
- 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。

## Especially claim:

- This specification is expected to be checked within 2 weeks. Without feedback after 2 weeks, KKA will take it as granted that customer approves of this specification.
- This specification will be invalid if no order within 2 years.

变更记录  
Revisions Record

| 变更版本<br>Version<br>No. | 变更时间<br>Change<br>Date | 变更原因<br>Reason | 变更内容<br>Change content | 负责人<br>By |
|------------------------|------------------------|----------------|------------------------|-----------|
| A0                     | 20210325               | 新增<br>Creation | 首次发行<br>Initial issue  |           |
| A1                     | 20220412               | 完善内容           | 增加安装内容                 |           |
| A2                     | 20240325               | 外壳颜色变更         | /                      |           |
| A3                     | 20240706               | 提升可读性          | 封面模版优化                 |           |
|                        |                        |                |                        |           |

KHFEVC-HY400 系列规格书

KHFEVC-HY400 Contactor Specification

1 ★ 线圈额定参数 Coil Rating

at -40 °C ~ 85 °C

|                                    |                                      |                                      |                                            |                                         |                                                  |                                                    |
|------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------------|-----------------------------------------|--------------------------------------------------|----------------------------------------------------|
| 额定电压<br>Rated<br>Voltage<br>Vd. c. | 动作电压<br>Operate<br>Voltage<br>Vd. c. | 释放电压<br>Release<br>Voltage<br>Vd. c. | 线圈电阻<br>Coil<br>Resistance<br>Ω (at 23 °C) | 最大启动电<br>流 Max<br>starting<br>current A | 平均保持电流<br>Mean holding<br>current A<br>大约 Approx | 线圈稳态功耗<br>Coil Power<br>W (at 23 °C)<br>大约 Approx. |
| 9~36                               | ≤9                                   | ≥5                                   | 3.1×(1±7%)                                 | 3.8                                     | 0.15A@12V                                        | 2W@12V                                             |

2 ★ 触点参数 Contact Specification

2.1 主触点参数

- 2.1.1 主触点形式 Contact Arrangement: 一组常开 H 1 Form A。
- 2.1.2 触点材料 Contact Material: 铜合金 Copper Alloy。
- 2.1.3 接触电阻 Contact Resistance: ≤0.5 mΩ (at 400 A)。
- 2.1.4 触点额定负载 Contact Rating: 400A (at 240mm<sup>2</sup> wire)。
- 2.1.5 最大分断电流 Max Breaking Current: 2000 A 450 Vd. c. (1ops)。
- 2.1.6 最大切换电压 Max Switching Voltage: 1000 Vd. c.。
- 2.1.7 最小适用负载 Min Applicable Load: 12 Vd. c. 1 A。
- 2.1.8 电流耐受 Current Endurance

| 电流 Current | 时间 Duration |
|------------|-------------|
| 400A       | 持续/cont.    |
| 500A       | 8min        |
| 600A       | 3min        |
|            |             |

电流耐受条件 Condition for current endurance

- 1) 环境温度 Ambient temperature: 85 °C;
- 2) 线圈激励电压为线圈额定电压 Supply rated voltage to coil;
- 3) 使用≥240mm<sup>2</sup>线径铜导线连接 The cross section area of wire is 240 mm<sup>2</sup>.

2.2 辅助触点参数

- 2.2.1 辅助触点形式 Aux. Contact Arrangement: 一组常开 H 1 Form A。
- 2.2.2 接触电阻 Contact Resistance: ≤300 mΩ (at 1A&6V)。
- 2.2.3 最大分断电流 Max Breaking Current: 2A, 30Vd. c. (1ops)&3A, 125Va. c. (1ops)。
- 2.2.4 最小适用负载 Min Applicable Load: 8 Vd. c. 100mA。

3 ★ 耐久性 Endurance

3.1 电耐久性 Electrical Endurance

| 产品型号<br>Product model | 结构型式<br>Version | 触点负载<br>Contact Rating                                                  | 环境温度<br>Ambient Temperature | 通断比<br>ON: OFF  | 电耐久性<br>Electrical Endurance |
|-----------------------|-----------------|-------------------------------------------------------------------------|-----------------------------|-----------------|------------------------------|
| KHFEVC-HY<br>400      | 一组常开1Form A     | 正向&反向切换 Switching:<br>稳态 Steady 400A<br>触点电压 Contact Voltage 450Vd. c.  | 常温<br>Room Temperature      | 0.6 s:<br>5.4 s | 6000次<br>(ops)               |
|                       |                 | 正向&反向切换 Switching:<br>稳态 Steady 400A<br>触点电压 Contact Voltage 750Vd. c.  |                             |                 | 3000次<br>(ops)               |
|                       |                 | 正向&反向切换 Switching:<br>稳态 Steady 100A<br>触点电压 Contact Voltage 1000Vd. c. |                             |                 | 1000次<br>(ops)               |
|                       |                 | 正向&反向分断 Breaking:<br>稳态 Steady 2000A<br>触点电压 Contact Voltage 450Vd. c.  |                             | ON:0.2s         | 1次(ops)                      |

3.2 机械耐久性 Mechanical Endurance

| 结构型式<br>Version | 触点负载<br>Contact Rating | 环境温度<br>Ambient Temperature | 通断比<br>ON: OFF | 机械耐久性<br>Mechanical Endurance |
|-----------------|------------------------|-----------------------------|----------------|-------------------------------|
| 一组常开<br>1Form A | 无负载<br>No load         | 常温<br>Room Temperature      | 0.25 s:0.25 s  | 2×10 <sup>5</sup> 次 (ops)     |

4 ★ 绝缘电阻 Insulation Resistance

4.1 试验前 Before Test

断开触点电路的各引出端之间 Between open contacts::1000 MΩ (1000 Vd. c.)。  
线圈引出端与触点引出端之间 Between coil and contact :1000 MΩ (1000 Vd. c.)。

4.2 试验后 After Test

断开触点电路的各引出端之间 Between open contacts: 50 MΩ (1000 Vd. c.)。  
线圈引出端与触点引出端之间 Between coil and contact: 50 MΩ (1000 Vd. c.)。

5 ★ 介质耐压 Dielectric Strength (漏电流 Leak Current:1 mA )

5.1 试验前 Before Test

断开触点电路的各引出端之间 Between open contacts: 3000 Va. c. (50/60 Hz 1 min) 。  
线圈引出端与触点引出端之间 Between coil and contact: 2200 Va. c. (50/60 Hz 1 min) 。

5.2 试验后 After Test

断开触点电路的各引出端之间 Between open contacts: 2000 Va. c. (50/60 Hz 1 min) 。  
线圈引出端与触点引出端之间 Between coil and contact: :2000 Va. c. (50/60 Hz 1 min)。

## 6 ★ 时间参数 Time(额定电压下 At Rated Voltage)

6.1 动作时间 Operate Time:  $\leq 30$  ms。

6.2 释放时间 Release Time:  $\leq 10$  ms。

6.3 回跳时间 Bounce Time:  $\leq 5$  ms。

## 7 ★ 振动 Vibration

正弦振动, 1.5 mm 双振幅, 10 Hz~500 Hz, 加速度  $49 \text{ m/s}^2$ , 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  $49 \text{ m/s}^2$ , 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 contactor appearance, construction and performance.

## 8 ★ 冲击 Shock

### 8.1 稳定性 Functional

$196 \text{ m/s}^2$  (脉冲持续时间 11 ms), 3000 次(三个相互垂直轴线的每一个方向 500 次, 激励和非激励各 250 次), 闭合回路的断开或开路回路的闭合时间应不超过  $10 \mu\text{s}$ 。 $196 \text{ m/s}^2$ , duration 11ms, 500 ops for each direction of three mutually perpendicular axes, 250 ops each for the energized and non-energized status, total 3000 shocks. The opening time for close contacts or the closing time for open contacts should not exceed  $10 \mu\text{s}$ .

### 8.2 强度 Destructive

$490 \text{ m/s}^2$  (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。 $490 \text{ m/s}^2$ , duration 6 ms, 50 shocks for each directions of three mutually perpendicular axes, total 300 shocks. There shall not be any abnormalities on contactor appearance, construction and performance.

## 9 ★ 标准测试条件 Standards Test Condition

9.1 温度 Temperature:  $23 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ 。

9.2 湿度 Humidity:  $25 \% \sim 75\% \text{ RH}$ 。

9.3 方向 Direction of Measurement: 任意 Free 。

## 10 ★ 使用条件 Operating Condition

10.1 温度 Temperature:  $-40 \text{ }^\circ\text{C} \sim 85 \text{ }^\circ\text{C}$  。

10.2 湿度 Humidity:  $5 \% \sim 85\% \text{ RH}$  。

10.3 安装方向 Mounting Direction: 任意 Free 。

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 contactor. Otherwise, the contactor may fail to work consequently.

11 ★ 贮存条件 Storage Condition

11.1 温度 Temperature: -40℃ ~ 85℃

11.2 湿度 Humidity: 5%~85% RH

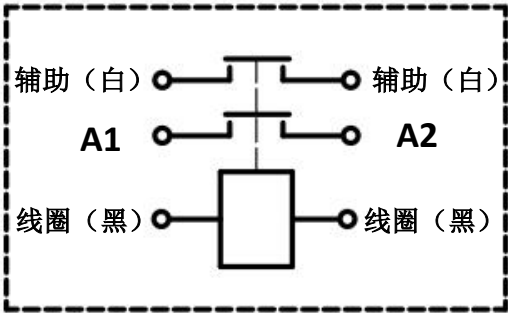
12 ★ 订货标记 Ordering Information

| 订货标记示例               |                              |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
|----------------------|------------------------------|---|---|---|-------|------|---|---|---|---|---|---|---|---|---|---|---|-----|
|                      | HFEVC                        | - | H | Y | 400 / | 1000 | - | N | - | W | - | D | - | □ | - | □ | - | XXX |
| 产品型号                 |                              |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 密封方式                 | H:环氧密封                       |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 产品形状                 | Y:圆形                         |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 负载电流                 | 400:400A                     |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 负载电压                 | 450:450V 750:750V 1000:1000V |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 辅助触点形式               | 无:不带 N:辅触常开                  |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 线圈电压                 | W:9~36VDC                    |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 负载引出端形式              | D:外螺纹型                       |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 线圈引出端形式              | 无:引出线                        |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 安装方式                 | 无:立式安装                       |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |
| 特殊特性号 <sup>(1)</sup> | 无:标准型 XXX:客户需求,代号1~999       |   |   |   |       |      |   |   |   |   |   |   |   |   |   |   |   |     |

备注:(1)客户特殊要求由我司评审后,按照特性号的形式标识。

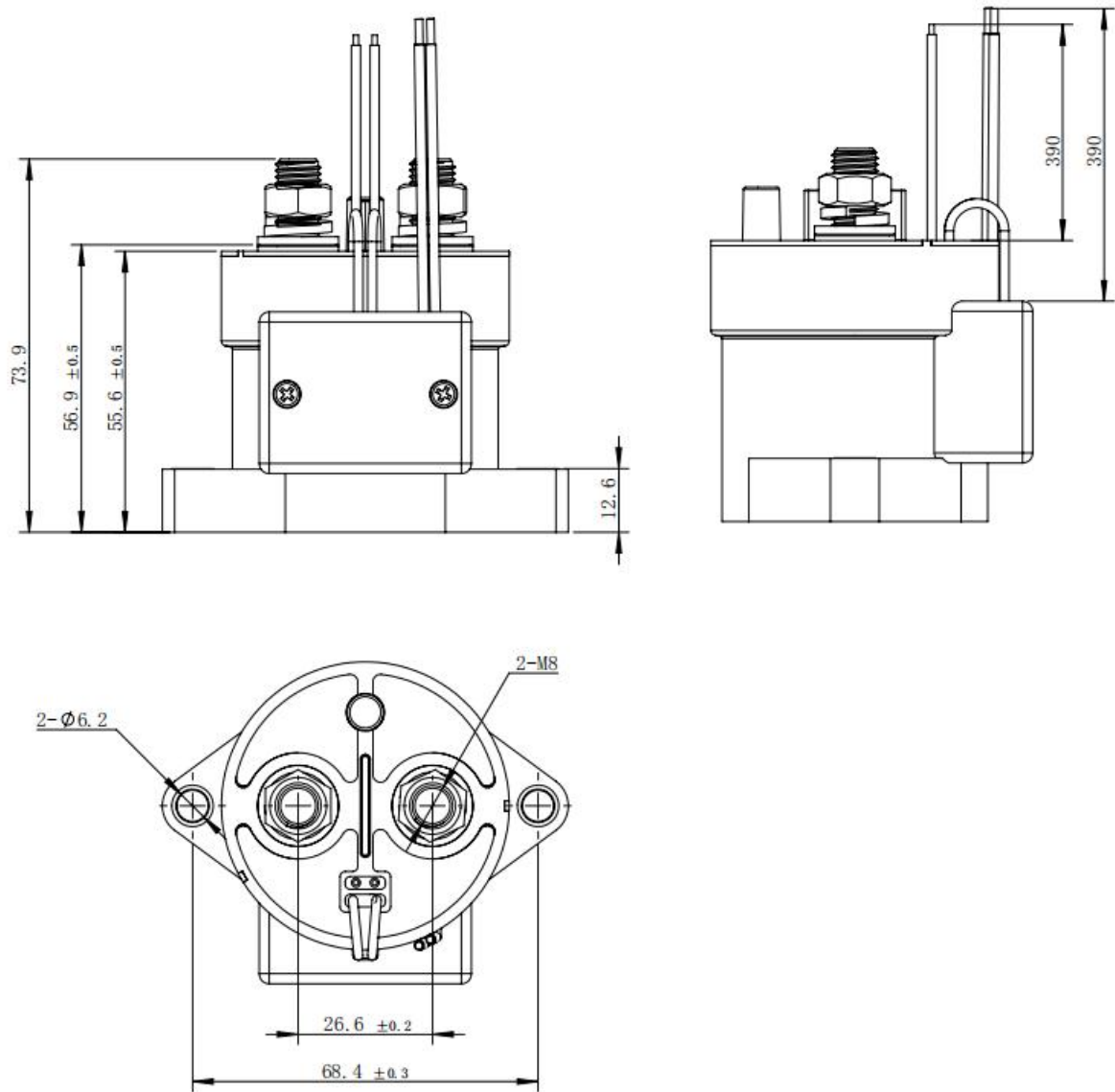
13 ★ 产品结构 Configuration

13.1 接线图 Wiring Diagram



注1: 负载、线圈均无极性 No polarity on the load and coil

13.2 外形图 Outline Dimensions:



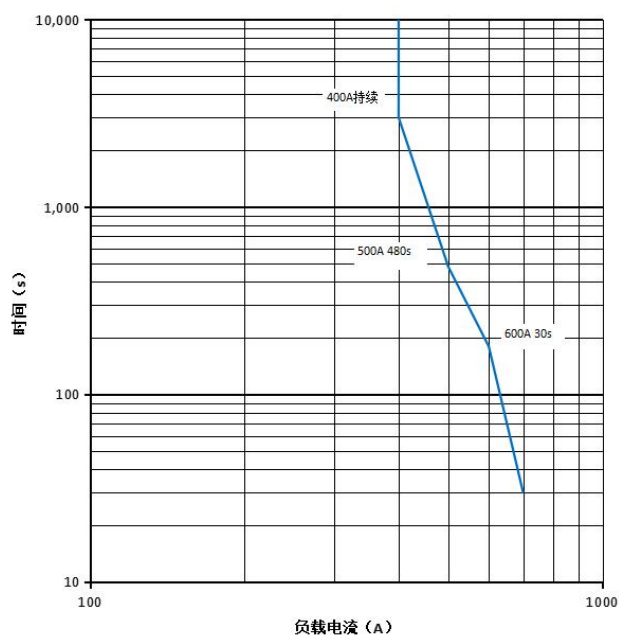
| 产品型号<br>Product model   | 重量<br>Unit Weight |
|-------------------------|-------------------|
| KHFEVC-HY400/1000-N-W-D | 430g              |
| KHFEVC-HY400/1000-W-D   | 425g              |

注 2: 产品外形尺寸未注尺寸公差按下表执行。  
Note: All unspecified tolerance according to following table.

| 产品外形尺寸未注尺寸公差<br>Outline dimensions hadn't specified tolerance |                 |
|---------------------------------------------------------------|-----------------|
| 外形尺寸<br>Outline Dimensions                                    | 公差<br>Tolerance |
| $\leq 10$                                                     | $\pm 0.3$       |
| $> 10 \sim 50$                                                | $\pm 0.5$       |
| $> 50$                                                        | $\pm 0.8$       |

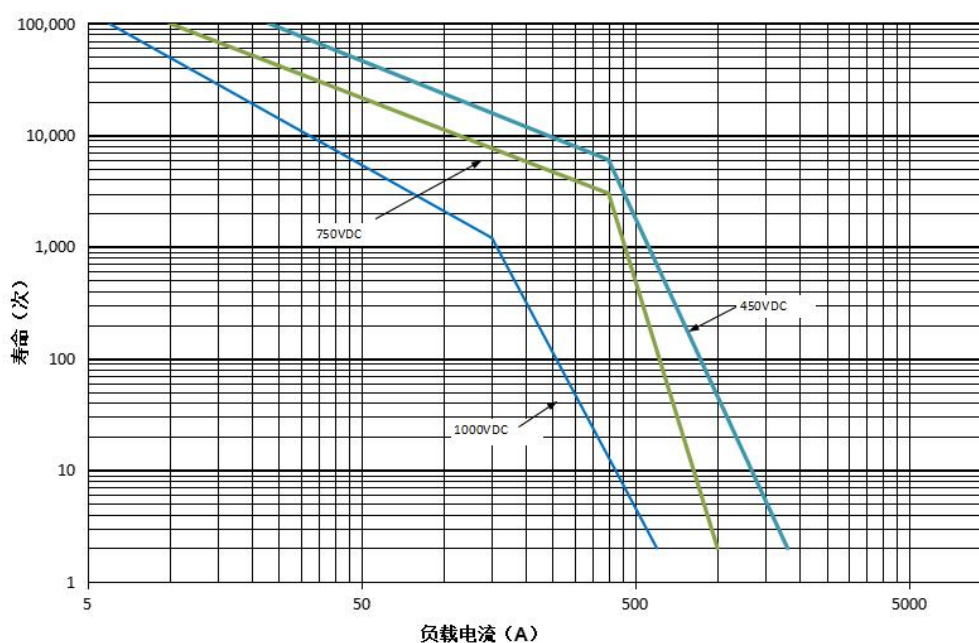
## 14 ★ 性能曲线图 Performance Curve

### 14.1 电流耐受曲线 Current tolerate curve



1. 导线截面积 $\geq 240\text{mm}^2$ ;
2. 以上数据在常温下测得, 仅作参考, 请勿直接用于选择熔断器。

### 14.2 电寿命预估曲线





## 15 ★ 其他说明 Others

### 15.1 供应商 Supplier

浙江库客安电气科技有限公司 Zhejiang KKA Electrics 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** 对环方而言，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，请与环方联系，以便获取更多的技术支持；但产品选型责任仅由客户负责。KKA 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 KKA 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. KKA 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  $L/R \geq 1\text{ms}$  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  $L/R \geq 1\text{ms}$  inductive load (L Load), otherwise it may lead to the decrease of electrical endurance and defective switch.

**15.3.4** 此为带线路板的产品已经装有反向浪涌吸收电路, 因此不必再使用浪涌保护器。带节能板的产品接通电源后, 约 200ms 后, 电路开始自动切换, 请不要在该时间段重复通断操作, 否则可能会损坏接触器节能板。产品线圈的驱动电路功率必须大于产品线圈功率, 否则会降低产品的切断能力。Products with circuit boards are already equipped with reverse surge absorption circuits, so there is noneed to use surge protectors. After the products with energy saving panel are connected to the power supply, the circuit will automatically switch about 200ms later. Please do not repeat the on-off operation during this period, or the energy saving panel of contactor may be damaged. Drive power must be greater than coil power or it will reduce performance capability.

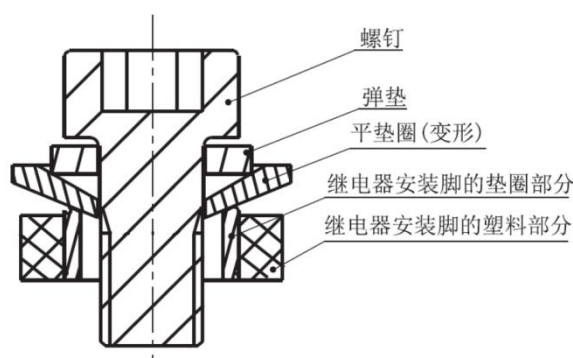
**15.3.5** 对继电器的线圈和触点连续通电流, 电源被切断后又马上接通, 此时由于线圈的温度增加, 线圈的电阻会增大, 从而使得产品的吸合电压升高, 有可能导致超出额定吸合电压。在这种情况下, 应采取以下措施: 降低负载电流; 限制持续通电时间或采用比额定吸合电压更高的线圈电压。The coil and contact of the relay are continuously energized, and the power supply is cut off and immediately connected. At this time, the resistance of the coil will increase due to the increase of the temperature of the coil, so that the suction voltage of the product will increase, which may lead to the excess of the rated suction voltage. In this case, the following measures should be taken: reduce the load current; Limit continuous power or use coil voltage higher than rated suction voltage.

施加在线圈两端的电压超过最大允许施加电压时，可能会因线圈温度上升而导致线圈损坏和层间短路。When the voltage applied to both ends of the coil exceeds the maximum allowable applied voltage, the coil temperature may rise and lead to coil damage and inter-layer short circuit.

**15.3.6** 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 contactor contacts are sealed and filled with gas. When the contact temperature changes, there is internal gas penetrating characteristic. Huanfang contactors are forbidden to be used at the temperature beyond our suggestion -40℃～85℃ for long time.

**15.3.7** 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.

**15.3.8** 为防止出现松动，接触器安装时请使用垫圈。接触器安装处请使用 M5 螺钉，螺钉锁紧扭矩请控制在  $3\text{N}\cdot\text{m}\sim 4\text{N}\cdot\text{m}$ ；In order to prevent loosening, please use the washer when installing the contactor. Please use the M5 screws to install contactor, screw locking torque within  $3\text{N}\cdot\text{m}\sim 4\text{N}\cdot\text{m}$  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.



**15.3.9** 请避免在引出片上粘附油脂等异物，请使用  $185\text{mm}^2$  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  $\geq 185\text{mm}^2$ , or they may cause overheating to the terminal part.

**15.3.10** 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                                          |
|----------------------------------|----------------------------------------|------------------------------------------------------|
| M 8                              | 3 mm                                   | $9\text{N}\cdot\text{m}\sim 10\text{N}\cdot\text{m}$ |

**15.3.11** 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 contactor has fallen down.

**15.3.12** 环保措施 Environmental Protection

库客安产品均符合 RoHS 要求。KKA products are all RoHS compliant.

**15.3.13** 库客安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。KKA 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.