

苏州和琦电气有限公司

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## 产品规格书

## Specification

|                                                                                                                                                                                                                                                                                                                                                           |             |                                             |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------|-------------------------|
| 产品名称<br>Product Name                                                                                                                                                                                                                                                                                                                                      |             | 高压直流继电器<br>High Voltage DC Relay            |                         |
| 产品型号<br>Product Model                                                                                                                                                                                                                                                                                                                                     |             | HEVR6V-250C                                 |                         |
| 发布日期<br>Publish Date                                                                                                                                                                                                                                                                                                                                      |             | 2022.10.15                                  |                         |
| 生产厂家<br>Production Plant                                                                                                                                                                                                                                                                                                                                  |             | 苏州和琦电气有限公司<br>Suzhou Heqi Electric Co., Ltd |                         |
| 版本<br>Version                                                                                                                                                                                                                                                                                                                                             |             | Version 1.0                                 |                         |
| 和琦电气审核签字<br>Signature by HEQI                                                                                                                                                                                                                                                                                                                             |             |                                             | 顾客确认<br>Custom Approval |
| 拟制<br>Make                                                                                                                                                                                                                                                                                                                                                | 审核<br>Check | 批准<br>Approval                              |                         |
|                                                                                                                                                                                                                                                                                                                                                           |             |                                             |                         |
| 特别说明：<br>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。<br>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。<br>Especially claim:<br>1.This specification is expected to be checked within 2 weeks. Without feedback after 2 weeks, HEQI will take it as granted that customer approves of this specification.<br>2.This specification will be invalid if no order within 2 years. |             |                                             |                         |

## 变更履历

### Revisions Record

| 变更<br>版本<br>Version<br>No. | 变更<br>日期<br>Change<br>Date | 变更内容<br>Description | 原因<br>Reason   | 负责人<br>By |
|----------------------------|----------------------------|---------------------|----------------|-----------|
| V1.0                       | 2022.10.5                  | /                   | 新增<br>Creation | 张平年       |

## 技术参数

### Technical Parameter

#### 一、线圈额定参数 Coil Rating

at -40 °C~85 °C

| 额定电压<br>Rate<br>Voltage<br>Vd.c. | 线圈形式<br>Coil Type     | 吸合电压<br>Operate<br>Voltage<br>Vd.c. | 释放电压<br>Operate<br>Voltage<br>Vd.c. | 线圈电阻<br>Coil<br>Resistance | 线圈功耗<br>Coil Power<br>W (at 23°C)<br>大约 Approx. |
|----------------------------------|-----------------------|-------------------------------------|-------------------------------------|----------------------------|-------------------------------------------------|
| 12V                              | 单线圈<br>Single<br>Coil | ≤9                                  | ≥1.2                                | 24×(1±7%)                  | 6                                               |
| 24V                              | 单线圈<br>Single<br>Coil | ≤9                                  | ≥1.2                                | 96×(1±7%)                  | 6                                               |

#### 二、触点参数 Contact Specification

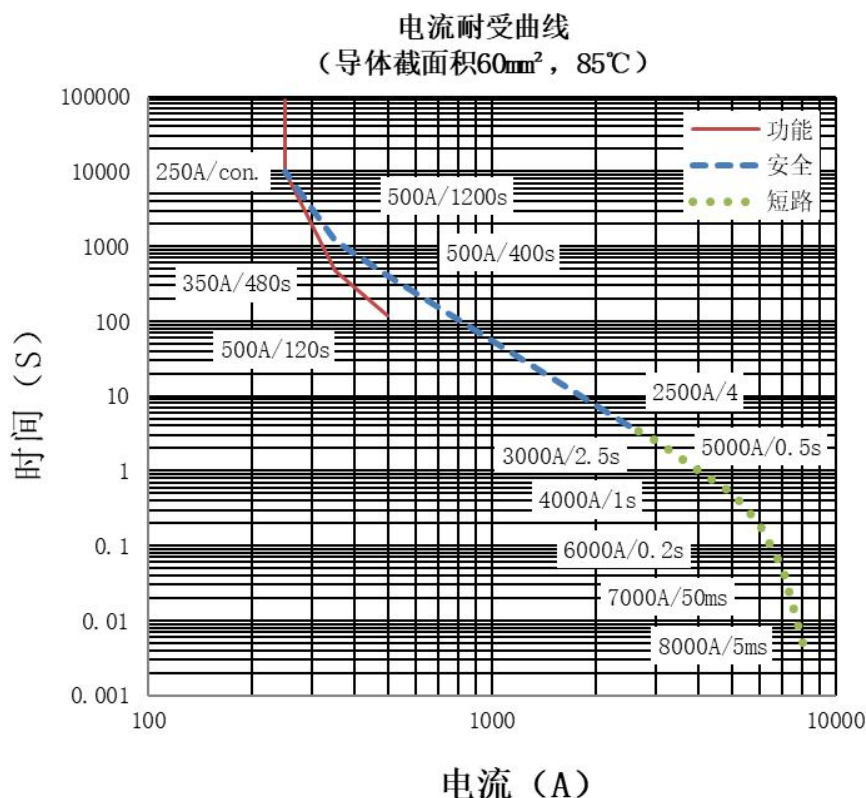
|                                  |                                    |                |
|----------------------------------|------------------------------------|----------------|
| 触点形式<br>Contact Arrangement      | 1 组常开 1 Form A                     |                |
| 触点材料<br>Contact Material         | 铜合金 Copper Alloy                   |                |
| 接触电阻<br>Contact Resistance       | ≤1 mΩ (at 250 A)                   |                |
| 触点额定负载<br>Contact Rating         | 250 A (at 60 mm <sup>2</sup> wire) |                |
| 最大分断电流<br>Max. Breaking Current  | 2000A/450Vd.c. (1 op)              |                |
| 最大切换电压<br>Max. Switching Voltage | 1000 Vd.c.                         |                |
| 最小适用负载<br>Min. Applicable Load   | 6Vd.c./1A                          |                |
| 电流耐受<br>Current Endurance        | 电流<br>Current                      | 时间<br>Duration |
|                                  | 250A                               | 持续/ Cont.      |
|                                  | 350A                               | 5 min          |
|                                  | 500A                               | 2min           |
|                                  | 900A                               | 30s            |
|                                  | 1000A                              | 25s            |

注Note: 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 60mm<sup>2</sup> 线径铜导线连接。The cross section area of wire is 60 mm<sup>2</sup>.



### 三、 耐久性 Endurance

#### 3.1 电耐久性 Electrical Endurance

| HEVR6V-250C                                               |
|-----------------------------------------------------------|
| 接通 Making: 14.5Vd.c./250A<br>2 × 10 <sup>4</sup> 次(ops)   |
| 通断 Switching: 450Vd.c./250A<br>1 × 10 <sup>3</sup> 次(ops) |
| 通断 Switching: 800Vd.c./250A<br>200 次(ops)                 |
| 分断 Breaking: 450Vd.c./2000A<br>1 次(op)                    |
| 分断 Breaking: 800Vd.c./1500A<br>1 次(op)                    |

注Note: 测试条件Test condition: 常温Room Temperature、通断比Switching profile 0.6s:5.4s

#### 3.2 机械耐久性 Mechanical Endurance

|                       |                     |
|-----------------------|---------------------|
| 线圈电压 Coil Voltage     | 12Vd.c.             |
| 通断比 Switching Profile | 0.6s ON/ 5.4s OFF   |
| 触点负载Contact Rating    | 无负载No Load          |
| 机械寿命Mechanical Life   | 2×10 <sup>5</sup> 次 |

### 3.3 短路电流耐受 Short Circuit Current Withstand

|                      |                                                                                  |
|----------------------|----------------------------------------------------------------------------------|
| 线圈电压 Coil Voltage    | 12Vd.c.                                                                          |
| 触点负载 Contact Rating  | 450Vd.c./8000A                                                                   |
| 耐受时间Withstand Time   | 5ms                                                                              |
| 产品标准Product Criteria | 外观和结构良好，不起火、不冒烟、无裂纹。Appearance and structure OK, no fire, no smoke and no crack. |

## 四、 绝缘电阻 Insulation Resistance

|                                           |                                                                                                                                   |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 断开触点间<br>Between open contacts            | 试验前 Before Test:<br>$\geq 1000\text{M}\Omega(@1000\text{Vd.c.})$<br>试验后 After Test:<br>$\geq 50\text{M}\Omega(@1000\text{Vd.c.})$ |
| 线圈引出端与触点引出端之间<br>Between contact and coil | 试验前 Before Test:<br>$\geq 1000\text{M}\Omega(@1000\text{Vd.c.})$<br>试验后 After Test:<br>$\geq 50\text{M}\Omega(@1000\text{Vd.c.})$ |

## 五、 介质耐压 Dielectric Strength

|                                                                               |                                                                                                                                                           |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 断开触点间（漏电流<1mA） Between open contacts<br>(Leak Current<1 mA)                   | 试验前 Before Test:<br>$\geq 4000\text{Va.c.}, (50/60\text{ Hz } 1\text{min})$<br>试验后 After Test:<br>$\geq 3000\text{Va.c.}, (50/60\text{ Hz } 1\text{min})$ |
| 线圈引出端与触点引出端之间<br>（漏电流<1mA）<br>Between contact and coil<br>(Leak Current<1 mA) | 试验前 Before Test:<br>$\geq 3000\text{Va.c.}, (50/60\text{ Hz } 1\text{min})$<br>试验后 After Test:<br>$\geq 2250\text{Va.c.}, (50/60\text{ Hz } 1\text{min})$ |

## 六、 时间参数 Time

|                   |                    |
|-------------------|--------------------|
| 吸合时间 Operate Time | $\leq 30\text{ms}$ |
| 释放时间 Release Time | $\leq 10\text{ms}$ |
| 回跳时间 Bounce Time  | $\leq 5\text{ms}$  |

## 七、 机械冲击、随机振动 Mechanical Shock and Vibration

|                                         |                                                       |
|-----------------------------------------|-------------------------------------------------------|
| 机械冲击-强度<br>Mechanical Shock-Destructive | $588\text{ m/s}^2$                                    |
| 机械冲击-稳定性<br>Mechanical Shock-Functional | 闭合 ON: $588\text{m/s}^2$<br>断开 OFF: $196\text{m/s}^2$ |
| 随机振动 Vibration                          | 10-500Hz, $49\text{m/s}^2$                            |

## 八、 标准测试条件 Standards Test Condition

|                             |                                                            |
|-----------------------------|------------------------------------------------------------|
| 温度 Temperature              | $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ |
| 湿度 Humidity                 | 25%~75%RH                                                  |
| 方向 Direction of Measurement | 任意 Random                                                  |

## 九、 使用条件 Operating Condition

|                                                                     |                                                |
|---------------------------------------------------------------------|------------------------------------------------|
| 触点允许的最高温度(长时)Maximum allowable temperature of contacts (long-term)  | $130^{\circ}\text{C}$                          |
| 触点允许的最高温度(短时)Maximum Allowable Temperature of Contacts (short-term) | $180^{\circ}\text{C}$                          |
| 温度 Temperature                                                      | $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ |
| 湿度 Humidity                                                         | 5%~85%RH                                       |
| 海拔 Altitude                                                         | $\leq 4000\text{m}$                            |
| 安装方向 Installation Direction                                         | 任意 Random                                      |

## 十、 贮存条件 Storage Condition

|                |                                              |
|----------------|----------------------------------------------|
| 温度 Temperature | $10^{\circ}\text{C} \sim 75^{\circ}\text{C}$ |
| 湿度 Humidity    | 5%~95%RH                                     |

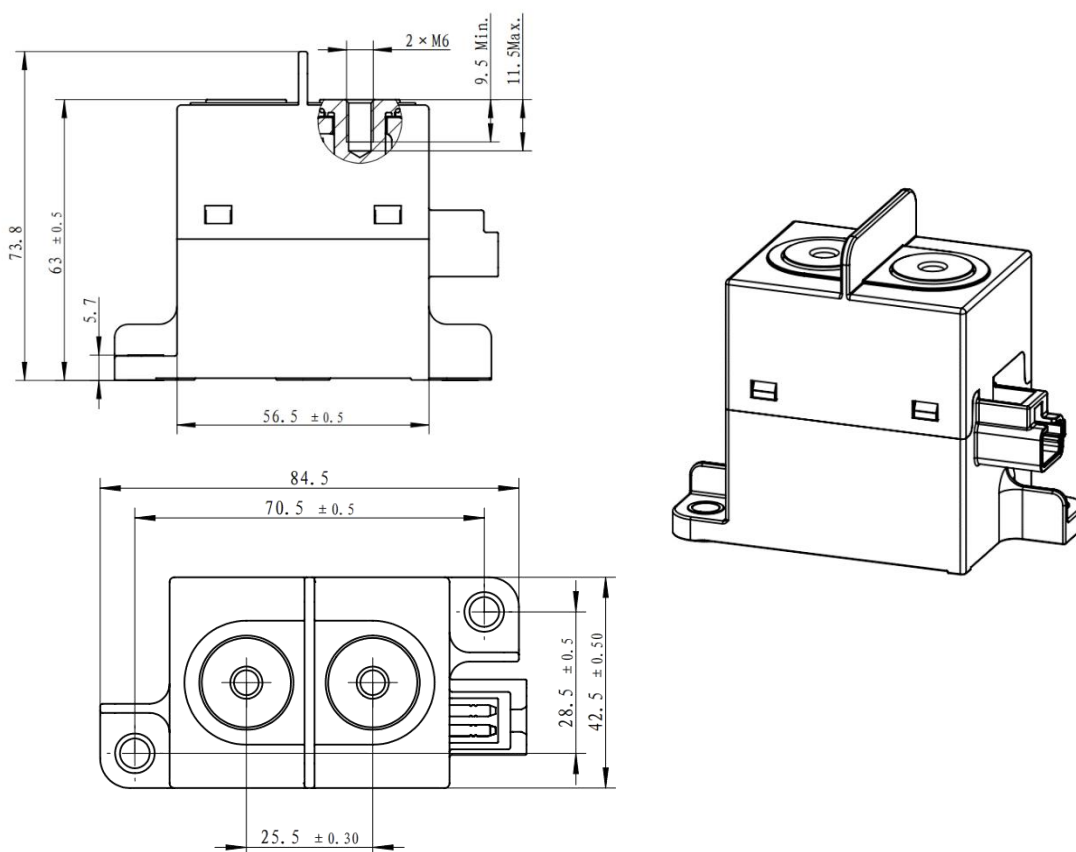
## 十一、产品型号命名规则 Product Names and Type Rules

|                       |                                |     |   |      |   |      |     |    |   |   |   |
|-----------------------|--------------------------------|-----|---|------|---|------|-----|----|---|---|---|
|                       | HE                             | VR6 | V | -250 | C | /750 | -12 | -H | C | 5 | * |
| 公司名称<br>Company       | HE: HEQI                       |     |   |      |   |      |     |    |   |   |   |
| 密封类型<br>Seal type     | VR6:陶瓷继电器<br>Ceramic Relay     |     |   |      |   |      |     |    |   |   |   |
| 应用场合<br>Application   | V: 新能源汽车<br>Electric Vehicle   |     |   |      |   |      |     |    |   |   |   |
| 产品容量<br>Capacity      | 250: 250A                      |     |   |      |   |      |     |    |   |   |   |
| 系列细分<br>Series        | C: C 系列                        |     |   |      |   |      |     |    |   |   |   |
| 负载电压<br>Load Voltage  | 无: 450V 750:750V 1000: 1000V   |     |   |      |   |      |     |    |   |   |   |
| 线圈电压<br>Coil Voltage  | 12: 12Vd.c. 24:24Vd.c.         |     |   |      |   |      |     |    |   |   |   |
| 触点形式<br>Contact Type  | H: 一组常开<br>1 Form A            |     |   |      |   |      |     |    |   |   |   |
| 线圈引出<br>Coil Terminal | C: 连接器<br>Connector            |     |   |      |   |      |     |    |   |   |   |
| 负载引出<br>Load terminal | 5: 内螺纹<br>Bolt Terminal Female |     |   |      |   |      |     |    |   |   |   |
| 客户代码<br>Customer code |                                |     |   |      |   |      |     |    |   |   |   |

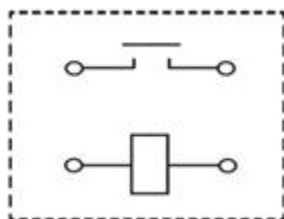
## 十二、 产品结构 Configuration

### 12.1 外形尺寸 Outline Dimensions

产品型号: HEVR6V-250C/\*\*\*-\*\*-HC5



### 12.2 接线图 Wiring Diagram



备注: 负载、线圈均无极性

Note: No polarity on the load and coil

#### 注 Note:

1) 产品外形尺寸未注公差参照下表执行。

Undeclared dimensional tolerance according to following table.

|                  |      |       |      |
|------------------|------|-------|------|
| 尺寸 Dimension(mm) | <10  | 10~50 | > 50 |
| 公差 Tolerance(mm) | ±0.3 | ±0.5  | ±0.8 |

2) 推荐连接器Recommended connector:

矢崎 7283-1020 Yazaki 7283-1020

天海 0435317 THB0435317

3) 产品默认出货不含连接器线束、螺钉、垫片、弹垫等安装配件。

The default product is shipped without connector harness,screws,washers,spring washers and other installation accessories.

### 十三、 其他说明Others

13.1 供应商：苏州和琦电气有限公司

Supplier:Suzhou Heqi Electric Co., Ltd

13.2 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 data sheet are the initial values tested under standard testing condition.

13.3 触点请避免附着异物、油脂类及腐蚀性液体，否则会导致接触器触点端发热异常。

Please avoid foreign bodies, grease or corrosive liquids in the terminal, otherwise it will lead to abnormal heating at contact terminals.

13.4 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.

13.5 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 3 N·m~4 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 3 N·m~4N·m; Damage may occur when it is beyond the range.

13.6 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.

|                                          |                                                         |                                                                |                                                         |              |
|------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|--------------|
| 负载端螺钉大小<br>Screw on the load<br>terminal | 建议铜牌厚度<br>Recommended<br>thickness of<br>copper bus bar | 建议铜牌开孔尺寸<br>Recommended hole<br>dimension of<br>copper bus bar | 建议铜排平面度<br>Recommended<br>Flatness of copper<br>bus bar | 扭矩<br>Torque |
|------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|--------------|

|    |     |                                                  |     |                                                           |
|----|-----|--------------------------------------------------|-----|-----------------------------------------------------------|
| M6 | 3mm | $\Phi 6.0\text{mm} \sim$<br>$\Phi 6.5\text{ mm}$ | 0.1 | $6\text{N}\cdot\text{m} \sim$<br>$8\text{N}\cdot\text{m}$ |
|----|-----|--------------------------------------------------|-----|-----------------------------------------------------------|

13.7 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 the 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.

13.8 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（ $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ ）环境中。

The relay contacts are sealed and filled with gas. When the contact temperature changes, there is internal gas penetrating characteristic. HEQI relays are forbidden to be used at the temperature beyond our suggestion  $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$  for long time.

13.9 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.

13.10 和琦产品均符合RoHS要求。

HEQI products are all RoHS compliant.

13.11 和琦保留对产品更改的权利，顾客购买产品前请确认规格书版本。

HEQI reserves the right to change the product. Customers should confirm the version of the specification before purchasing the product.

13.12 如需获取更多信息与支持，请联系苏州和琦电气有限公司。

Please contact HEQI for more information or support.