



厦门宏发电力电器有限公司

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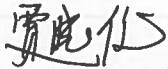

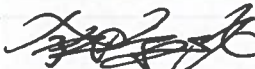
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产品规格书

Specification

文件编号 File No. 4588748GGS003

产品名称 Product Name: <u>直流继电器 DC RELAY</u>		
产品型号 Product model: <u>HFE80V-20C</u>		
发布日期 Publish Date: <u>2019年11月21日 Nov 21th, 2019</u>		
生产工厂 Production Plant: <u>厦门宏发电力电器有限公司</u>		
<u>Xiamen Hongfa Electric Power Controls Co.,Ltd.</u>		
版本 Version: <u>k</u>		
宏发审批签字 Signature by Hongfa		顾客确认 Customer Approval
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 2019.11.20	 2019.11.20	 19.11.21
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产品规格书 Specification

e	2017.7.6	13.1 新增 L 型脚位图 Add the outline of L version	新增 New	许永泽 Yongze Xu
		14.3.7 提高波峰焊焊接能力 Improve wave soldering ability	为满足市场需求,波峰焊(260±5)℃,时间(3~5)s提高至(265±5)℃,时间(3~8)s To meet marketing request, wave soldering (260 ± 5) °C to (265 ± 5) °C, time (3~ 5) s to (3~ 8) s	
f	2017.8.10	13.1 更新外形图 Update the outline of facade	更新点胶后的外形特征 Update the exterior character of Fluid dispensing	许永泽 Yongze Xu
g	2018.1.12	13.3 刷新产品安装孔位图 Update the outline of installation hole	更新原有安装孔位图并添加新孔位图 Update the original outline of installation hole and add a new one	闭应辉 Yinghui Bi
h	2018.4.24	13.1 增加各型号产品重量数据 Add weight data for each model	标准化刷新 Standardized refresh	闭应辉 Yinghui Bi
i	2018.8.14	13.1 更新 HTQ2J、HTQ2AJ 型号外形图 Update the outline dimension of type HTQ2J and HTQ2AJ.	产品外形结构变更 Change product appearance and structure	闭应辉 Yinghui Bi
		13.1 刷新各型号产品重量数据 Refresh weight data for each model		
j	2018.11.14	14.3.6 HTQ2J 型号螺钉锁紧扭矩由 1.4N.m ~ 2.2N.m 改为 0.8N.m~1.1N.m The screw locking torque of type HTQ2J change from 1.4N.m~2.2N.m to 0.8N.m~1.1N.m	螺钉锁紧扭矩标准刷新 Screw locking torque standard refresh	闭应辉 Yinghui Bi

产品规格书 Specification

k	2019.11.21	13.4 新增 PCB 板安装规范 Add PCB board installation specification	新增 New	贾晓俊 Jia Xiaojun
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HFE80V-20C 规格书

HFE80V-20C Relay Specification

1 线圈额定参数 Coil Rating

at -40°C~85°C

额定电压 Nominal Voltage Vd. c.	动作电压 Pick-up Voltage Vd. c.	释放电压 Drop-out Voltage Vd. c.	线圈电阻 Coil Resistance Ω (@23°C)	线圈功耗 Coil Power W (at 23 °C) 大约 Approx.
12	≤9	≥1	48×(1±10%)	3
24	≤18	≥2	192×(1±10%)	3
48	≤36	≥4	768×(1±10%)	3

2 触点参数 Contact Specification

- 2.1 触点形式 Contact Arrangement: 1组常开 1H
- 2.2 触点材料 Contact Material: 铜+银合金 Cu+Ag Alloy
- 2.3 接触电阻 Contact Resistance: ≤5mΩ (at 1 A)
- 2.4 触点额定负载 Contact Rating: 20A 450Vd. c. (at ≥4mm²)
- 2.5 最大分断电流 Max. Contact Current: 30A (at 450Vd. c.) (≥5 ops)
- 2.6 最大切换电压 Max. Contact Voltage: 750Vd. c. (at 2 A)
- 2.7 最小适用负载 Min. Applicable Load: 6 Vd. c. 1 A
- 2.8 电流耐受 Current Endurance

电流 Current	时间 Duration
20 A	持续/Cont.
30 A	1h
40 A	20min
80 A	30s
120 A	10s
200 A	0.6s

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4mm²线径铜导线连接。The cross section area of wire is 4mm².

3 耐久性 Endurance

3.1 电耐久性 Electrical Endurance

产品型号 Product model	结构型式 Version	环境温度 Ambient Temperature	触点负载 Contact Rating	通断比 ON: OFF	电耐久性 Electrical Endurance
HFE80V-20C	一组常开 1H	常温 Room Temperature	切换 Switching: 稳态 Steady 20A 触点 电压 Contact Voltage 450 Vd. c.	0.6s:5.4s	3×10^3 次 (ops)
			切换 Switching: 稳态 Steady 10A 触点 电压 Contact Voltage 450 Vd. c.	0.6s:5.4s	1×10^4 次 (ops)
			接通 Making: 稳态 Steady 20A 触点 电压 Contact Voltage 450 Vd. c.	0.6s:5.4s	7.5×10^4 次 (ops)

3.2 机械耐久性 Mechanical Endurance

结构型式 Version	触点负载 Contact Rating	环境温度 Ambient Temperature	通断比 ON: OFF	机械耐久性 Mechanical Endurance
一组常开 1H	无负载 No load	常温 Room Temperature	0.25s:0.25s	2×10^5 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 (500 Vd. c.)

线圈引出端与触点引出端之间 Between coil and contact : 1000 MΩ (500 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 (500 Vd. c.)

线圈引出端与触点引出端之间 Between coil and contact : 50 MΩ (500 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: 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: 3000 Va. c. (50/60 Hz 1 min)

5.2 试验后 Before test

断开触点电路的各引出端之间 Between open contacts: 1500 Va. c. (50/60 Hz 1 min)

线圈引出端与触点引出端之间 Between coil and contact: 2250 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: $\leq 30\text{ms}$

6.2 释放时间 Release Time: $\leq 10\text{ms}$

6.3 回跳时间 Bounce Time: $\leq 5\text{ms}$

7 振动 Vibration

正弦振动, 1.5mm 双振幅, 10Hz~500Hz, 加速度 49m/s^2 , 三个相互垂直轴线的每一个方向 8h (激励和非激励各 4h), 共 24h。继电器外观、结构和性能不应有异常。

Sinusoidal vibration, 1.5mm double amplitude, 10Hz to 500Hz, acceleration 49m/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.

8 冲击 Shock

8.1 稳定性 Functional

196m/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 $10\mu\text{s}$ 。

196m/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

490m/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。

490m/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.

9 标准测试条件 Standards Test Condition

9.1 温度 Temperature: 23°C ± 5°C

9.2 湿度 Humidity: 25% ~ 75 % RH

9.3 方向 Direction of Measurement: 任意 Free

10 使用条件 Operating Condition

10.1 温度 Temperature: -40 °C ~ 85 °C

10.2 湿度 Humidity: 5 % ~ 85 % 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 relay. Otherwise, the relay may fail to work consequently.

11 贮存条件 Storage Condition

11.1 温度 Temperature: -40°C ~ 85°C

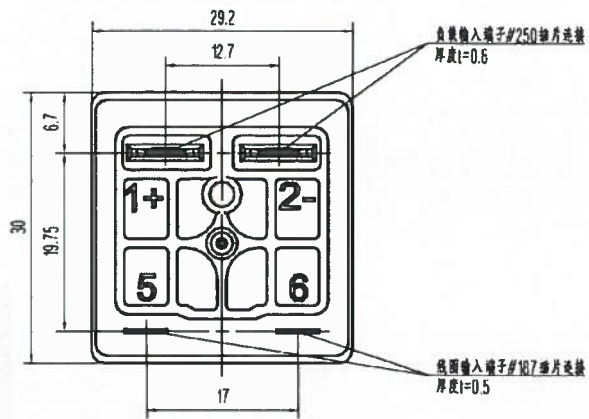
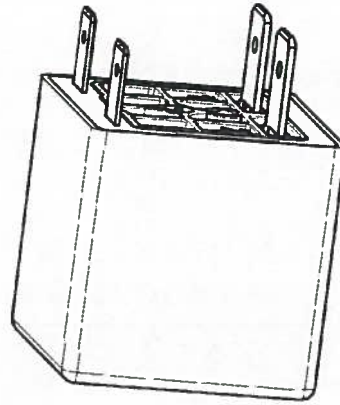
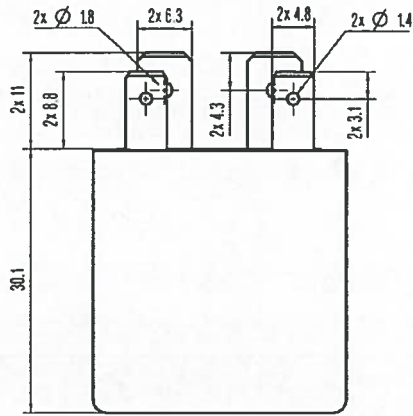
11.2 湿度 Humidity: 5% ~ 85% RH

12 订货标记 Ordering Information

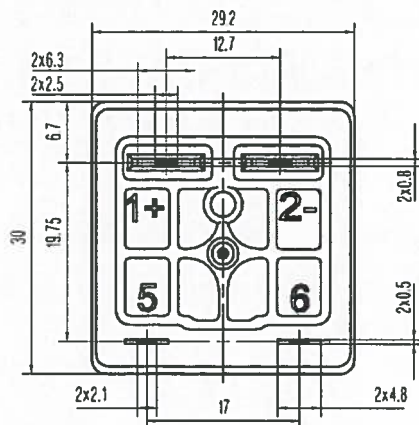
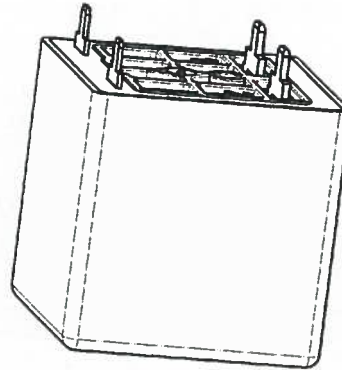
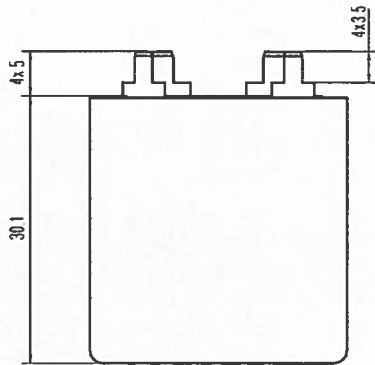
HFE80 V -20 C / 450 - 12 - H T Q 2 A J (XXX)
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

①产品型号 Type	HF E80
②应用场合 Application	V: 新能源汽车领域 Vehicle
③系列代号 Series Code	20: 20A
④系列细分 Series	C: C类 C Series
⑤负载电压 Load Voltage	450: 450 Vd. c. 无: 60 Vd. c. Nil: 60 Vd. c.
⑥线圈电压 Coil Voltage	12: 12 Vd. c. 24: 24 Vd. c. 48: 48 Vd. c.
⑦触点形式 Contact Type	H: 常开型 1 Form A
⑧触点种类 coil termination	T: AgSnO ₂
⑨线圈引出端形式 coil terminal	Q: QC引出端 QC terminal P: PCB引出端 PCB terminal
⑩负载引出端形式 Load terminal	2: QC引出端 2: QC terminal 无: PCB引出端 Nil: PCB terminal

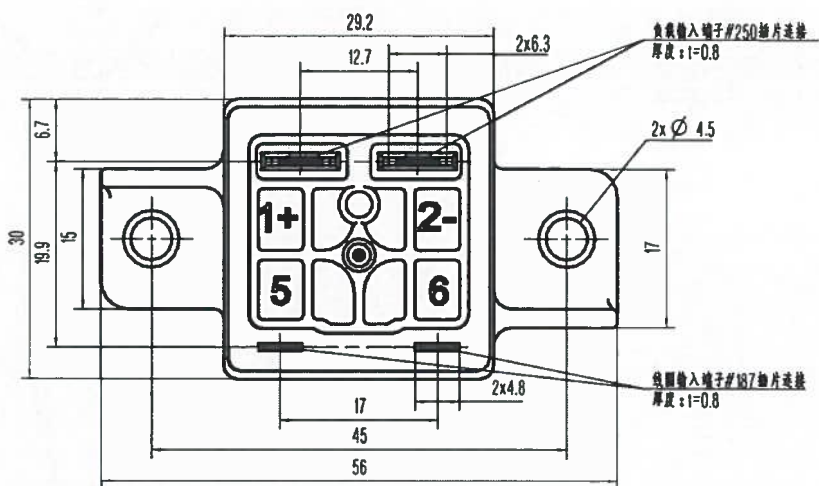
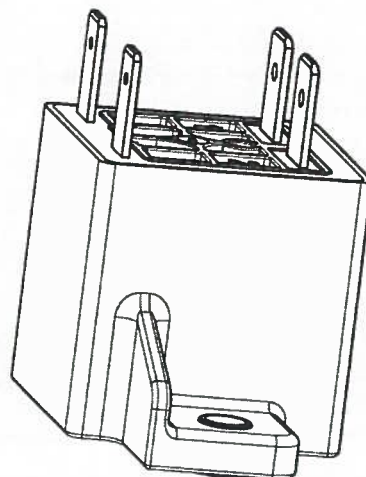
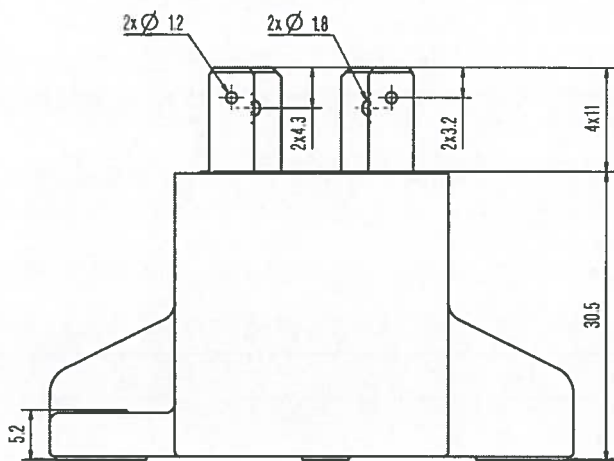
型号: HFE80V-20C/XXX-XX-HTQ2AJ



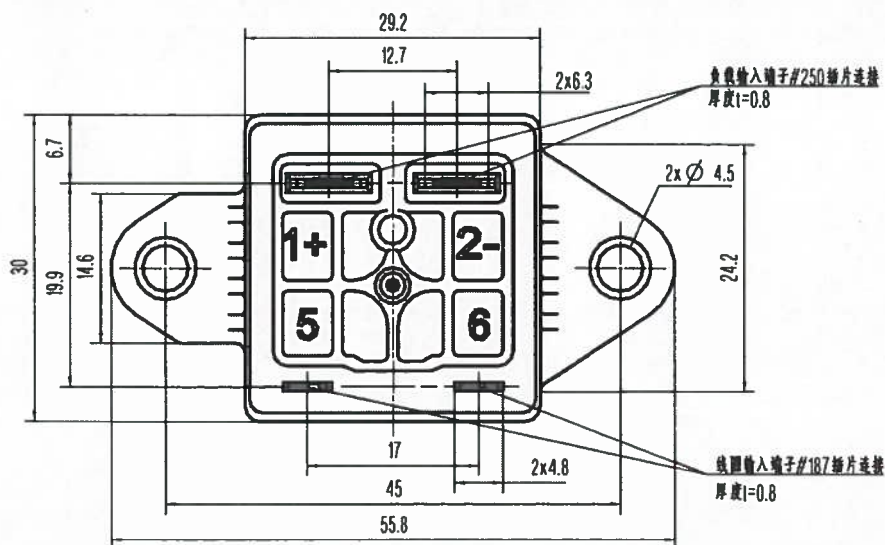
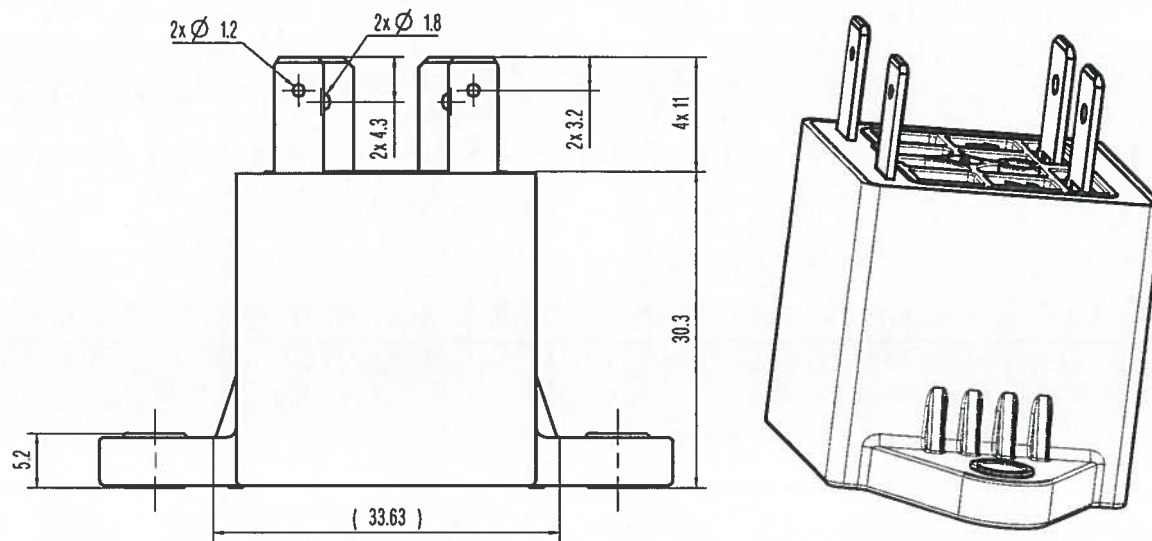
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型号: HFE80V-20C/XXX-XX-HTQ2BJ

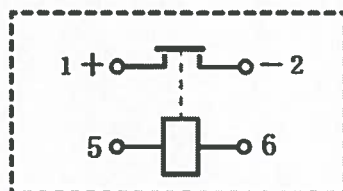


型号: HFE80V-20C/XXX-XX-HTQ2LJ

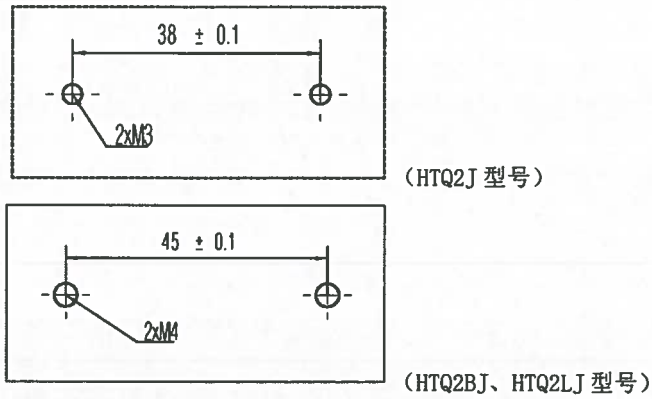


产品型号 Product model	重量 Unit Weight
HFE80V-20C/XXX-12-HTQ2J	约 50g
HFE80V-20C/XXX-12-HTQ2AJ	约 50g
HFE80V-20C/XXX-12-HTPAJ	约 50g
HFE80V-20C/XXX-12-HTQ2BJ	约 55g
HFE80V-20C/XXX-12-HTQ2LJ	约 55g

13.2 接线图 Wiring diagram



13.3 安装孔位图 installation hole



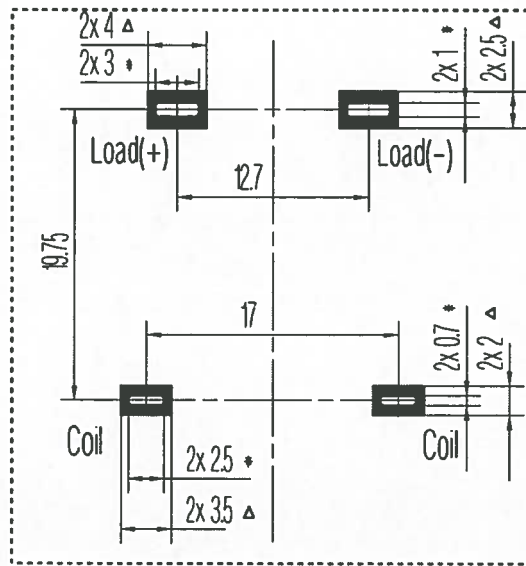
注 1: 线圈无极性, 负载有极性

Note 1: No polarity on the coil, but polarity on the load.

注 2: 产品外形尺寸未注尺寸公差按下表执行。

Note 2: All unspecified tolerance according to following table.

13.4 PCB 板安装规范 PCB board installation specification



注: 带*尺寸为 PCB 板端子开孔尺寸, 带Δ尺寸为 PCB 板焊盘尺寸。(供参考)

Note: The dimensions of * is the opening dimensions of PCB board,

The dimensions of Δ is the dimensions of PCB pads. (For reference)

产品外形尺寸未注尺寸公差 Outline dimensions hadn't specified tolerance	
外形尺寸 Outline Dimensions	公差 Tolerance
≤10	±0.3
>10~50	±0.5
>50	±0.8

14 其他说明 Others

14.1 供应商 Supplier

厦门宏发电力电器有限公司 Xiamen Hongfa Electric Power Controls Co., Ltd.

14.2 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.

14.3 注意事项 Notes

14.3.1 对宏发而言, 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, 请与宏发联系, 以便获取更多的技术; 但因产品选型责任仅由客户负责。

We could not evaluate all the performance and all the parameters for every possible application. The customer can choose the right product according to the specific using conditions and requirements. If there is any questions, please contact Hongfa for the technical service. However, customer will responsible for what they choosed it is the user's responsibility to determine which product should be used only.

14.3.2 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, our commitment is only based on rated load. In case our products are used beyond our commitment, we will not response for the failure.

14.3.3 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。

Contacts rating value is the value on resistive load. Please take measures of surge absorption 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.

14.3.4 为抑制继电器线圈的反向电动势, 建议加装非线性 (推荐使用可变电阻, 最大能量耐量: 1J 以上; 电压: 额定操作电压的 1.5~2 倍)。若使用二极管, 会使继电器释放时间大大加长, 肯定会导致切断性能下降, 敬请注意。

In order to curb the reverse electromotive force of coil, a nonlinear resistor is recommended to use (ZNR is recommended, the max energy tolerance: $\geq 1 \text{ J}$; Voltage: 1.5~2 times the rated operating voltage). Please be noted that a diode will make the release time of relay increase, which should lead to the degradation of cutting-off capability.

14.3.5 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.

14.3.6 为防止出现松动，继电器安装时请使用垫圈。继电器安装处 HTQ2J 型脚位请使用 M3 螺钉，螺钉锁紧扭矩请控制在 0.8N.m~1.1N.m，HTQ2BJ、HTQ2LJ 型脚位请使用 M4 螺钉，螺钉锁紧扭矩请控制在 2N.m~3N.m；继电器引出脚允许的插拔力为（1）负载引出端：49N；（2）线圈引出脚：49N。在超过范围的情况下，可能会造成破损。

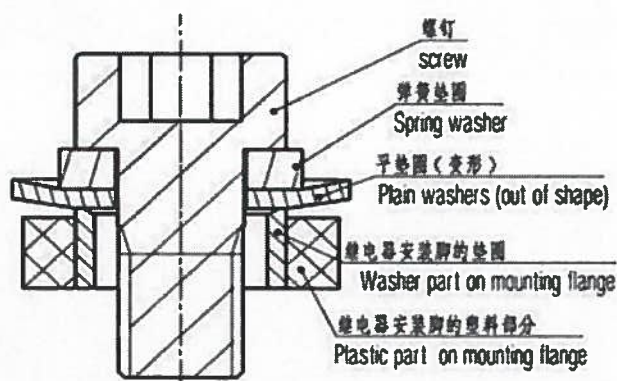
In order to prevent loosening, please use the washer when installing the relay. Please use the M3 screws to install relay with HTQ2J type terminals, screw locking torque within 0.8N.m~1.1N.m; Please use M4 screw to install relay with HTQ2BJ、HTQ2LJ type terminals ,screw locking torque within 2N.m~3N.m. Allowable pulling or pushing force for the terminal:(1)load terminal:49N;(2)coil terminal:49N. Damage may occur when it is beyond the range.

14.3.7 PCB 板焊接参数为：手工焊(380±20)℃，时间(3~5)s，波峰焊(265±5)℃，时间(3~8)s。

PCB welding parameters: manual welding (380 ± 20) °C, time (3~5) s, wave soldering (265 ± 5) °C, time (3~ 8) s.

14.3.8 使用 M4 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 M4 screw, make sure the steel ring' s thickness and strength are enough. Otherwise it will deform, and relay housing will be broken.



14.3.9 请避免在引出片上粘附油脂等异物，请使用 4mm² 以上规格的连接导线，否则有可能会造成引出部分的异常发热。

Please avoid grease and other foreign matter in the terminal, please use the connecting wire which is min 4mm², or they may cause abnormal heating in the terminal part .

14.3.10 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.

14.3.11 环保措施 Environmental Protection

宏发产品均符合 RoHS 要求。

Hongfa products are all RoHS compliant.

14.3.12 宏发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。

Hongfa 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.