

GRF-120A系列 Series

汽车继电器  
Automobile relay



- 产品特点
- 120A触点切换能力  
120A contact switching capacity
  - 工作温度高达125℃  
Operating temperature up to 125℃
  - 塑封和防尘罩型可供选择  
Plastic and dust cover types available
  - 可带瞬态抑制电阻或二极管  
With transient suppression resistor or diode

| 触点负载 Contact Rating                 |            |
|-------------------------------------|------------|
| 触点形式<br>contact form                | 1A/1C      |
| 触点材料<br>contact material            | 银合金 AgSn02 |
| 额定负载(阻性)<br>Rated load (Resistance) | 120A 14VDC |
| 最大切换电流<br>Max. switching Current    | 120A       |
| 最大切换电压<br>Max.Switching Voltage     | 30VDC      |
| 最大切换功率<br>Max.switching power       | 1680W      |

- 典型用途
- 后窗除雾器、电池断路装置、汽车空调、雾灯、大灯装置
  - Rear window demister, battery circuit breaker, conditioner, fog lamp, headlamp device
  - 电力分配、防抱死制动 (ABS)、牵引控制系统
  - Power distribution, anti lock braking (ABS) traction control system
  - 汽车应急启动电源
  - Automobile emergency starting power supply

| 性能参数Performance Parameter                 |                                        |                                                                              |
|-------------------------------------------|----------------------------------------|------------------------------------------------------------------------------|
| 绝缘电阻<br>Insulation resistance             |                                        | ≤100MΩ Min(DC500V)                                                           |
| 吸合时间 (额定电压下)<br>Operate Time              |                                        | 10ms Max                                                                     |
| 释放时间 (额定电压下)<br>Release Time              |                                        | 普通型 (Common type): 10ms Max<br>带电阻或二极管: ≤15ms Max<br>With resistor or diode: |
| 介质耐压<br>Dielectric Strength               | 断开的触点间BOC                              | 500VAC 50/60Hz 1分钟 Min                                                       |
|                                           | 触点与线圈间BCC                              | 500VAC 50/60Hz 1分钟 Min                                                       |
| 接触电阻 <sup>(1)</sup><br>Contact Resistance |                                        | 100mΩ max                                                                    |
| 抗振动<br>Anti vibration                     |                                        | 10HZ-55HZ 3mm 双振幅                                                            |
| 抗冲击<br>Shock resistance                   |                                        | 294m/m²                                                                      |
| 寿命<br>life                                | 机械寿命<br>Mechanical life                | 1×10 <sup>7</sup>                                                            |
|                                           | 电气寿命 <sup>(2)</sup><br>Electrical life | 3×10 <sup>4</sup><br>阻性, 室温1S ON/9S OFF                                      |
| 环境温度<br>ambient temperature               |                                        | -40℃~+125℃ (NO freezing)                                                     |
| 重量Weight                                  |                                        | 约36克 about36g                                                                |

备注: 1. 上述值为初始值  
2. 对于塑封型产品试验时, 应打开外壳上的透气孔  
1.remarks:The above values are initial values  
2.When experimenting with plastic encapsulated products, the vent holes on the housing should be opened

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线圈参数Coil Specification (at 23 °C)

| 额定电压<br>Nominal<br>Voltage<br>(VDC) | 吸合电压<br>Pull-In Voltage<br>(VDC) | 释放电压<br>Drop-Out Voltage<br>(VDC) | 线圈电阻<br>Coil resistance<br>× (1±10%) (Ω) | 继电器功耗<br>Relay power<br>consumption<br>(W) | 允许最大线圈电压 <sup>(1)</sup><br>Maximum allowable<br>voltage |      |
|-------------------------------------|----------------------------------|-----------------------------------|------------------------------------------|--------------------------------------------|---------------------------------------------------------|------|
|                                     |                                  |                                   |                                          |                                            | 23℃                                                     | 85℃  |
| 12                                  | ≤8.4                             | ≥0.6                              | 90                                       | 1.6                                        | 20.2                                                    | 15.7 |
| 12                                  | ≤8.4                             | ≥0.6                              | 80                                       | 1.8                                        | 20.2                                                    | 15.7 |
| 24                                  | ≤16.8                            | ≥1.2                              | 360                                      | 1.6                                        | 40.5                                                    | 31.5 |
| 24                                  | ≤16.8                            | ≥1.2                              | 320                                      | 1.8                                        | 40.5                                                    | 31.5 |

备注：1. 触点无负载电流、线圈电阻为最小值情况下时，继电器线圈允许短时间施加的最大工作电压。

1. When there is no load current at the contact and the coil resistance is at its minimum, the maximum operating voltage allowed to be applied to the relay coil in a short period of time

订货标记Ordering Information

| GRF - S - 1 12 D M P 40 F R (XXX)    |   |   |   |   |                                                            |   |   |   |    |    |
|--------------------------------------|---|---|---|---|------------------------------------------------------------|---|---|---|----|----|
| 1                                    | 2 | 3 | 4 | 5 | 6                                                          | 7 | 8 | 9 | 10 | 11 |
| 1.基本型号 Model Number: GRF             |   |   |   |   | 8.负载类型 Load type: 40-40A; 无-标准型 80A; 100: 100A             |   |   |   |    |    |
| 2.封装形式 Encapsulation form:           |   |   |   |   | 120:120A 150:150A                                          |   |   |   |    |    |
| S: 防尘罩型 Dust Protected               |   |   |   |   | 40-40A ; Nil:80A; 100:100A; 120:120A; 150:150A             |   |   |   |    |    |
| SS 防助焊剂型 Anti-flux type              |   |   |   |   | 9.支架类型: 无-无支架型; F1-铁支架; F-塑料支架                             |   |   |   |    |    |
| 3.触点组数 Contact Group: 1: 1 组 1 Group |   |   |   |   | Bracket:Nil-No Bracket Standard;F1-Metal Bracket Standard; |   |   |   |    |    |
| 4.线圈规格 Coil Voltage :                |   |   |   |   | F-Plastic Bracket Standard                                 |   |   |   |    |    |
| 06: 6VDC 12: 12VDC 24: 24VDC         |   |   |   |   | 10.线圈并联元件: Parallel Coil Components                        |   |   |   |    |    |
| 5.线圈功率 Coil Power: D-1.6W, L-1.8W    |   |   |   |   | 无-标准型 R-并联电阻 D/DC-关联二极管(详见接线图)                             |   |   |   |    |    |
| 6.触点形式 Contact form: M-1Form A       |   |   |   |   | Nil-Standard ; R-With Resistor; D/DC-With Parallel         |   |   |   |    |    |
| 7.引出脚形式 Terminal:                    |   |   |   |   | Diode(See wiring diagram for details)                      |   |   |   |    |    |
| P-PCB 引脚 无-快捷端子引脚                    |   |   |   |   | 11.特性号 special Code:                                       |   |   |   |    |    |
| P-PCB Terminal; Nil-QC Terminal      |   |   |   |   | 特性号: XXX-字母或数字: 客户特殊要求; 无-标准型                              |   |   |   |    |    |
|                                      |   |   |   |   | XXX-Letters or numbers: customer specific requirements ;   |   |   |   |    |    |
|                                      |   |   |   |   | Nil-Standard                                               |   |   |   |    |    |

备注：

1. 在洁净环境（不含H2S、SO2、NO2、粉尘等污染物）下使用时，推荐使用防焊剂型产品
2. 在污染焊剂（含一定量的H2S、SO2、NO2粉尘等污染物）下使用时建议选用塑封产品，并请在实际使用中进行确
3. 当继电器装入PCB版焊接后，如需进行整体清洗或表面处理，请与我司联系，以便商定合适的焊接条件、合格的产品规格。

remarks:

- (1)When using in clean environment (without H2S SO2 NO2 dust and other pollutants), it is recommended to Use flux resistant products. When using in polluted environment(with a certain amount of H2S SO2 NO2dust and other pollutants), it is recommended to use plastic encapsulated products.please confirm in actual use.
- (2)After the relay is installed into the PCB board for welding, if it needs overall cleaning or surface treatment, please Contact me to negotiate the appropriate welding conditions and product specifications.

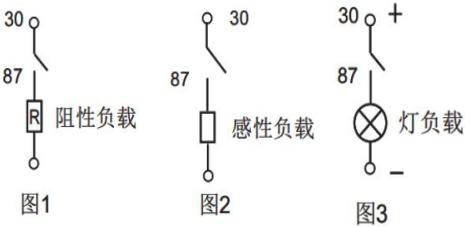
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类型type

| 触点负载电压<br>Contact load resistance | 负载类型<br>Contact load |         | 触点负载电流<br>Contact load current (A) | 通断比<br>On-off ratio |              | 电耐久性<br>(次)<br>Electrical durability (second) | 触点材料<br>Conact material | 触点接线图<br>Contact wiring diagram | 试验环境温度<br>Experimental ambient temperature                                 |
|-----------------------------------|----------------------|---------|------------------------------------|---------------------|--------------|-----------------------------------------------|-------------------------|---------------------------------|----------------------------------------------------------------------------|
|                                   |                      |         |                                    | 接通<br>On(S)         | 断开<br>Off(s) |                                               |                         |                                 |                                                                            |
| 标准型<br>14VDC                      | 阻性<br>Resistance     | 接通Make  | 120                                | 1                   | 9            | 3×10 <sup>4</sup>                             | AgSnO2                  | 见图1                             | 23℃                                                                        |
|                                   |                      | 断开Break | 120                                |                     |              |                                               |                         |                                 |                                                                            |
|                                   | 感性<br>percepual      | 接通Make  | 150                                | 2                   | 4            | 5×10 <sup>4</sup>                             | AgSnO2                  | 见图2                             | 详见电耐久性试验环境温度曲线Xiangjian electric durability test ambient temperature curve |
|                                   |                      | 断开Break | 50                                 |                     |              |                                               |                         |                                 |                                                                            |
|                                   | 灯<br>lam             | 接通Make  | 200                                | 0.5                 | 10           | 5×10 <sup>4</sup>                             | AgSnO2                  | 见图3                             |                                                                            |
|                                   |                      | 断开Break | 40                                 |                     |              |                                               |                         |                                 |                                                                            |

负载接线图Load wiring diagram

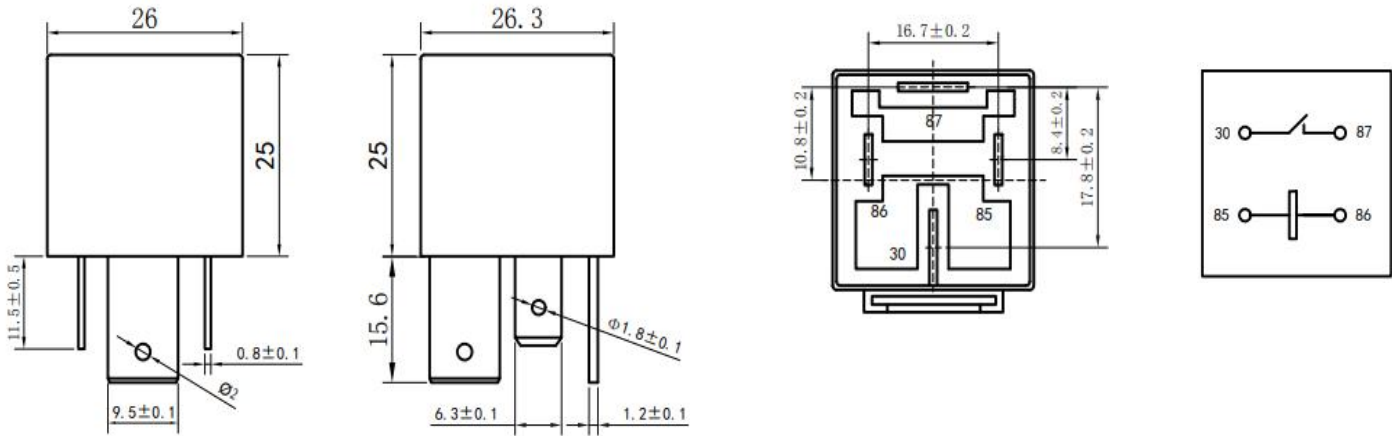


- 备注:
- 1.接通电流指峰值电流
  - 2.当用于闪光灯负载时,须采用特殊AgSnO2触点,接线时须注意正负极性要求,确保30#端接电源正极;
  - 3.负载接线图如图所示
  - 4.本表中负载仅针对线圈不带并联二极管、稳压管等元件的情况。

外形尺寸、接线、安装孔位图

Overall dimension,wiring and installation hole bitmap

快连接式(无支架)  
QUICK (Nil-No Bracket)



外形图  
Outline Dimensions

安装孔尺寸(底视图)  
PCB LAYOUT (Bottom View)

接线图(底视图)  
Wiring Diagram (Bottom View)

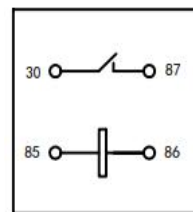
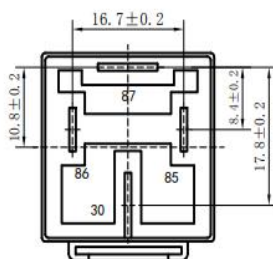
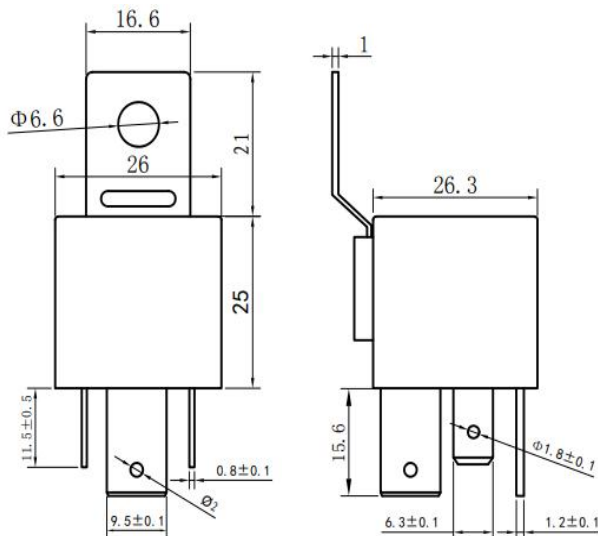
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外形尺寸、接线、安装孔位图

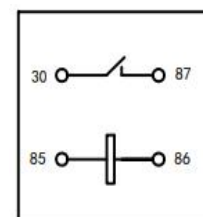
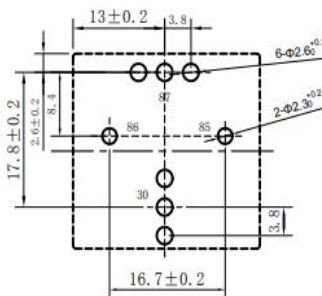
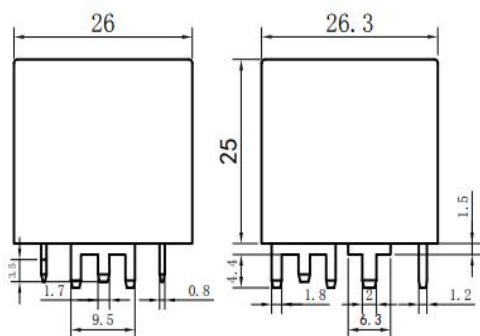
Overall dimension, wiring and installation hole bitmap

快连接式（有支架：铁背）QUICK（Bracket：Iron back）



PCB板式

PCB board type



外形图

Outline Dimensions

安装孔尺寸（底视图）

PCB LAYOUT（Bottom View）

接线图（底视图）

Wiring Diagram（Bottom View）

备注：

1. 产品外形图的引脚标注尺寸为沾锡前尺寸（沾锡后会变大），安装孔尺寸为推荐的PCB板孔的设计尺寸，具体PCB板孔设计尺寸可根据产品实物进行测绘、调整。
2. 产品部分外形尺寸未注尺寸公差，当外形尺寸 $\leq 1\text{mm}$ ，公差为 $\pm 0.2\text{mm}$ ；当外形尺寸在 $(1\sim 5)\text{mm}$ 之间时，公差为 $\pm 0.3\text{mm}$ ；当外形尺寸 $> 5\text{mm}$ ，公差为 $\pm 0.4\text{mm}$
3. 安装孔尺寸中未注尺寸公差为 $\pm 0.1\text{mm}$

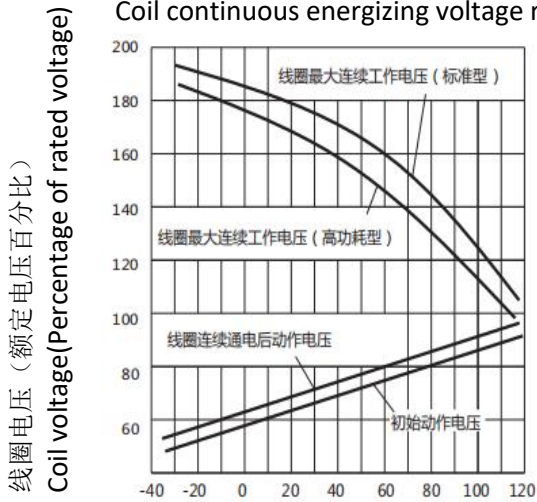
DISCLAIMER:

1. The pin dimension in the outline drawing or the product is the dimension before dipping tin(it gets bigger when stained with tin)The size of mountin hole is the recommended design size of PCB hole The specific PCB hole design size can be mapped and adjusted according to the actual product
2. The overall dimension of the product il not marked with dimensional tolerance,when teh overall dimension $\leq 1\text{mm}$ Tolerance is $\pm 0.2\text{mm}$  When the overall dimension is $(1\sim 5)\text{mm}$  Between Tolerance is $\pm 0.3\text{mm}$  When the overall dimension $> 5\text{mm}$ ,Tolerance is $\pm 0.4\text{mm}$
3. The dimension tolerance of mounting hole without dimension injection is  $\pm 0.1\text{mm}$

## 性能曲线图

1. 线圈连续通电电压范围

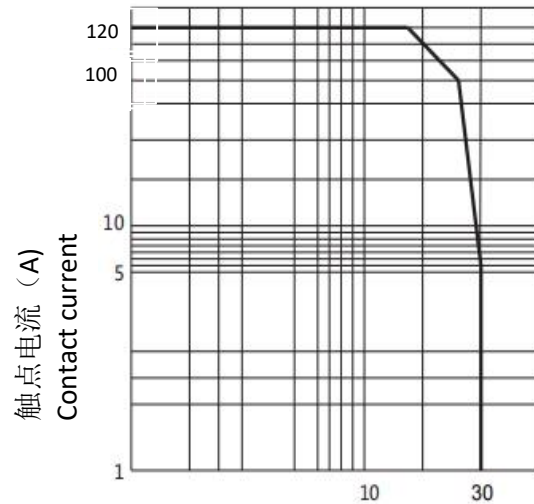
Coil continuous energizing voltage range



环境温度 (°C) ambient temperature

2. 允许最大负载范围

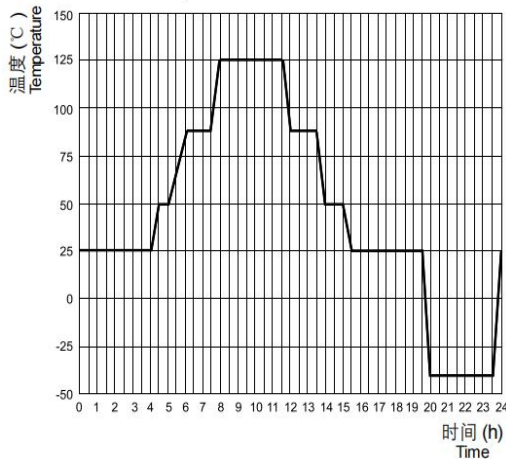
Allowable maximum load range



触点电压 (VDC)  
Contact voltage

3. 电耐久试验环境温度曲线

Ambient Temperature Curve of the Electrical Endurance Test



说明:

- (1) 最低温度为 -40°C
- (2) 最高温度为 125°C

- (1) The minimum temperature is -40°C .
- (2) The maximum temperature is 125°C

## 备注:

具体参数型号和产品性能以我司承认书为准, 本产品规格书仅作参考, 若有更改, 恕不另行通知。

对科信而言, 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, 因而客户应该根据具体的使用条件, 选择与之相匹配的产品。若有疑问, 请与科信联系 以便获取更多的技术支持。但产品选型责任仅由客户负责。

## DISCLAIMER:

The specific parameters, models, and product performance shall be subject to our company's acceptance letter. This product specification sheet is for reference only and is subject to change without prior notice.

For AFE, it is not possible to assess all performance requirements for relays in each specific application area and therefore the customer should select a suitable product for each specific application, please contact AFE for additional technical support. But the responsibility of product selection is only the responsibility of the customer.