

Thermal motor protector
电机温度(热)保护器
Temperature limiter 温度控制器
Thermal cut-out 温度开关

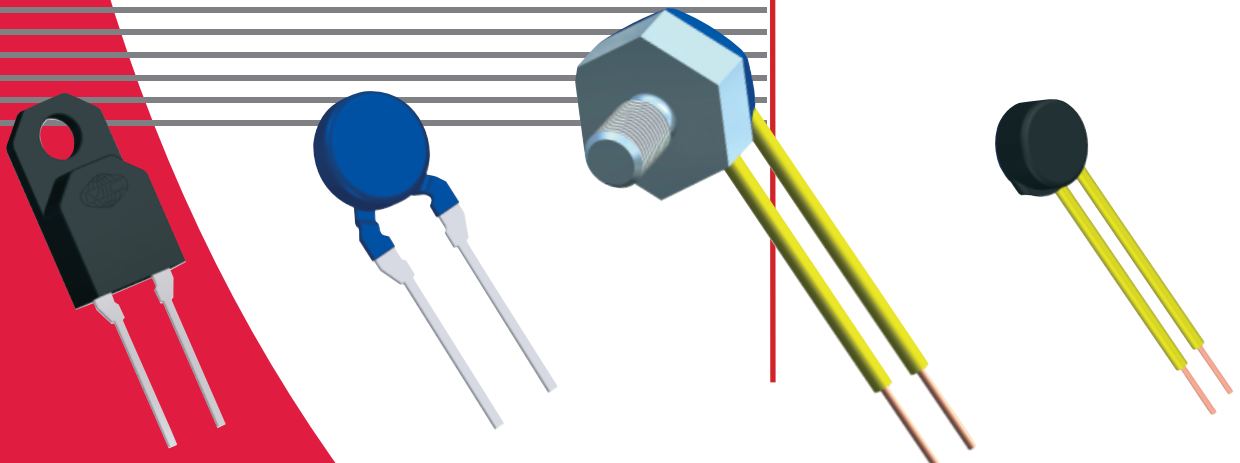
11
12
20
21

Applications 应用领域

- Motors 电机
- Transformers 变压器
- Coils 线圈
- Electronics, sensors
电子产品, 传感器

Benefits 优点

- Small dimensions 体积小
- Shock and vibration tested 通过冲击及振动测试
- Leadframe version 引线框架
- Tested for audio, video applications (EN 60065)
通过音频、视频等应用领域测试







MICROTHERM



Microtherm International Cooperation

Technical data 技术参数

| ratings 额定 | | control type 型号 | F11A F20A / E | F12A ¹⁾ | F21A / E | F20B / G F21B / G |
|--|------------|---|--|--------------------|---------------|----------------------|
| version 开关形式 | | normally closed 常闭 | | | | normally open 常开 |
| rated current at 250 V 50/60 Hz (power factor 0.95 / 0.6) 额定电流250V 50/60Hz (功率因数0.95/0.6) | | 2.0 A / 1.6 A | 3.0 A / 2.5 A | 3.0 A / 3.0 A | 2.0 A / 1.6 A | |
| switching cycles under rated current 开关寿命 | | 7,000 | 10,000 | 10,000 | 7,000 | |
| max. current at 250 V 50/60 Hz (power factor 0.95) 最大负载电流250V 50/60Hz (功率因数 0.95) | | 4.0 A | | 5.0 A | 4.0 A | |
| switching cycles under max. current 最大负载电流下的开关寿命 | | 3,000 | | | | |
| temperature rating T _a (steps in 5 K) 温度范围T _a (每级5K) | | 70 °C ... 160 °C | | | | 70 °C ... 155 °C |
| tolerances 公差 | | standard 标准: ± 5 K | | | | |
| feature of automatic action 自动动作特性 | | 1.B, 2.B.M, 1.C | | | | 2.B, 1.C |
| contact resistance (incl. wire of 100 mm) 接触电阻 (包括100mm引线) | | < 50 mΩ | | | | |
| hysteresis 复归温度范围 | | 30 K ± 15 K ²⁾ | | | | |
| dielectric strength (standard insulation) 耐高压 (标准绝缘) | | 2 kV | | | | |
| shock / vibration testing (similar to EN 50155) 冲击 / 振动测试 (类似于EN 50155) | | 400 m/s ² sine half wave / 100 m/s ² 5 Hz ... 2,000 Hz sine | | | | |
| resistances to impregnation 防渗透阻抗 | | tight against ordinary resins and lacquers 用树脂和油漆密封 | | | | |
| degrees of protection provided by enclosures (EN 60529) 外壳保护等级 | | IP00 | | | | |
| suitable for use in protection category 适合保护级别 | | I, II | | | | |
| approvals 认证 | VDE / ENEC |  | EN 60730-1 / -2-3 ³⁾ / -2-9 | | | |
| | UL |  | UL 2111 / UL 873 ¹⁾ | | | |
| | CSA / cUL |  | C22.2 No. 77 / C22.2 No. 24 ¹⁾ | | | |
| | CQC |  | GB14536.1-1998/GB14536.10-1996 ¹⁾ | | | |

¹⁾ details on request 按需求可提供详细资料

²⁾ at the T_a (upper and lower) limits the hysteresis could deviate 复归温度范围在高温及低温范围会有偏差

³⁾ different power rating 不同的额定功率

Standard wire (length 100 ± 10 mm, stripped 6 ± 1 mm)

标准引线 (长100±10mm, 剥落6±1mm)

| lead 引线 | code 代码 | temperature max. 耐最高温度 | operating voltage max. 最高工作电压 | diameter insulation 绝缘直径 | cross section diameter ¹⁾ 截面积 | UL style UL类型 |
|-----------------------------|-------------|---------------------------|----------------------------------|-----------------------------|---|------------------|
| stranded white 多支线 白色 | L300 | 150 °C | 300 V | 1.57 mm | AWG24 / 0.24 mm ² | 3398 |
| | L310 | | | 1.80 mm | AWG20 / 0.48 mm ² | |
| | L330 / L360 | 200 °C / 250 °C | 600 V | 0.90 mm / 1.10mm | AWG24 / 0.24 mm ² | 3557 \ 10362 |
| | L340 / L370 | | | 1.26 mm / 1.46mm | AWG20 / 0.61 mm ² | |
| solid yellow 单支线 黄色 | L400 | 150 °C | 300 V | 1.40 mm | AWG24 / 0.51 mm | 3398 |
| | L410 | | | 1.65 mm | AWG20 / 0.81 mm | |
| | L430 | 200 °C | 300 V | 1.21 mm | AWG24 / 0.51 mm | 1332 |
| | L440 | | | 1.51 mm | AWG20 / 0.81 mm | |

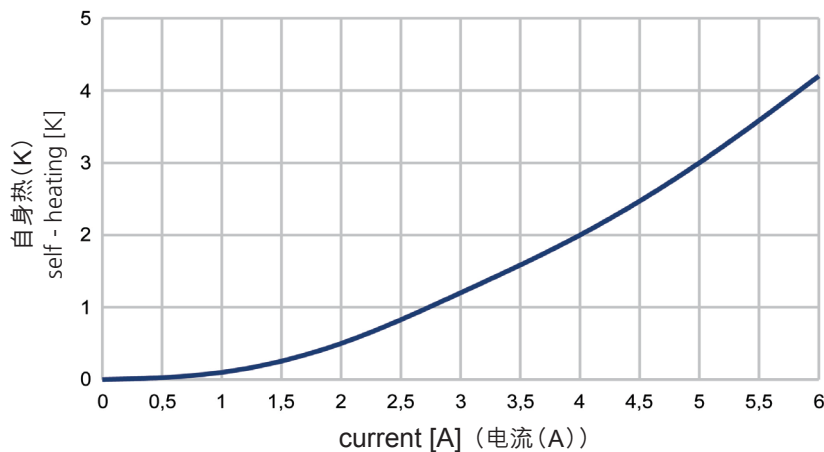
¹⁾ AWG24 recommended 推荐AWG24

| control type 型号 | nc 常闭 | no 常开 | code 代码 | illustration 图例 | drawing dimensions (mm) 图纸尺寸 | technical specification 技术特点 | approvals 认证 |
|----------------------|----------|----------|------------|--------------------|-----------------------------------|---------------------------------|-----------------|
| F11, F12 F20, F21 | A A | B | U254 | | | shrink cap potted 收缩帽密封胶 | VDE, UL, cUL |
| F11, F12 | A | | U198 | | | cap of PPS potted PPS帽密封胶 | VDE, UL, cUL |
| F20, F21 | A | B | U185 | | | | |

Specific variations 特殊产品型号

| control type 型号 | nc 常闭 | no 常开 | code 代码 | illustration 图例 | drawing dimensions (mm) 图纸尺寸 | technical specification 技术特点 | approvals 认证 |
|----------------------|----------|----------|------------|--------------------|-----------------------------------|--|----------------------|
| F11, F12 | A | | | | | not insulated potted 无绝缘密封胶 | VDE, UL cUL |
| F20, F21 | A | B | | | | not insulated potted 无绝缘密封胶 | VDE, UL, cUL, CSA |
| F11, F12 F20, F21 | A A | B | U112 | | | coated 涂层 | VDE, UL cUL |
| F20, F21 | A | B | A150 U280 | | | housing of PPS leadframe leads grid dimension 5.08 potted PPS帽 引线框架 脚位尺寸5.08 密封胶 | VDE, UL, cUL, CSA |
| F11, F12 F20, F21 | A A | B | A800 | | | not insulated potted 无绝缘密封胶 | VDE, UL cUL |
| F20, F21 | E | G | G700 | | | aluminium housing thread M4x6 potted 铝封装螺钉M4x6 密封胶 T _a max. 150 °C 最高限温150 °C | VDE, UL, cUL, CSA |
| F20, F21 | A | | U282 | | | housing of PPS potted PPS封装, 密封胶 | VDE, UL cUL |
| F11, F12 F20, F21 | A A | B | A150 U112 | | | leadframe leads grid dimension 5.08 coated 引线框架 脚位尺寸5.08 涂层 | VDE, UL, cUL, CSA |

Heating by current 不同电流温升曲线



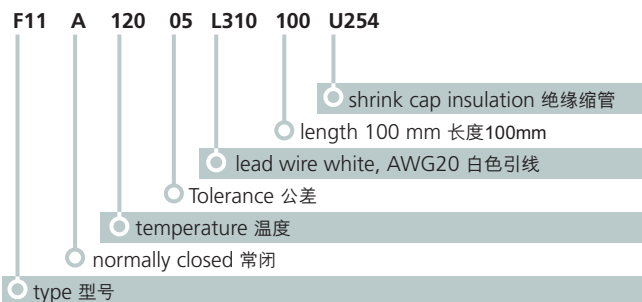
The characteristic curve in the diagram is measured with a thermal control without any insulation in an oil bath. 该曲线图的量度是用一个不带任何绝缘的温控器在一个油缸中测得。

Attention 注意:

The heating depends on the thermal conduction of the control to the equipment or part which should be protected. 加热程度取决于需保护设备或部件的导热性。

Ordering and marking example 分类及标识示例

Ordering example 型号示例



Deviations from standard controls on request. 根据要求可提供非标产品

Marking 示例解释

- F11A** type 类型 (F11 nc)
- 12005** response temperature 响应温度 (120°C), tolerance 公差 (±5K)
- 049D** date of manufacture 生产日期 (April.2009), country 国家 (D=Germany 德国)

Production Partner & Representation office (亚太区合作伙伴及国内代表处):

腾晖有限公司
香港九龙观塘巧明街114号
迅达工业大厦7楼D室
电话: +852 - 2304 1323
传真: +852 - 2950 9565
电邮: sales@triumph-kingfit.com.hk
网址: www.triumph-kingfit.com.hk

东莞东城腾晖电子玩具厂
广东东莞市东城立新科技工业园(同沙)第一工业区C区2栋
电话: +(86-769) - 2229 0157 / 2266 1389
传真: +(86-769) - 2229 0145
电邮: sales@triumph-kingfit.com.hk
网址: www.triumph-kingfit.com.hk

腾晖有限公司杭州办事处
浙江杭州市拱墅区假山路6号
新青年广场C座1505室
电话 / 传真: +(86-571) - 8738 8831
电邮: sales@triumph-kingfit.com.hk
网址: www.triumph-kingfit.com.hk

Microtherm GmbH Fon: +49 (0)7231 787-0
Taschenwaldstraße 3 Fax: +49 (0)7231 787-155
Postfach 1208 E-Mail: mic-pforzheim@microtherm.de
D-75112 Pforzheim Internet: www.microtherm.de

MICROTHERM

