

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

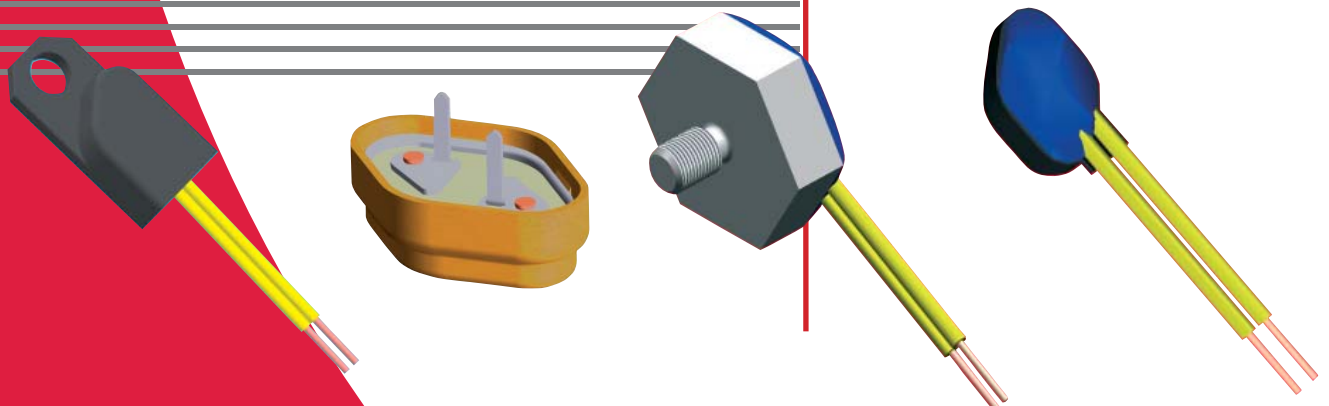
10  
11  
12  
22

## 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

- Temperature and current sensitive or  
only temperature sensitive  
对电流和温度都敏感或只对温度敏感
- Small dimensions 体积小
- High power rating 高负载功率



**MICROTHERM**



Microtherm International Cooperation

# Technical data [ 技术参数 ]

ratings 额定		control type 型号	T10A / E T11A / E	T12A / E	T22A	T10B / G	T22B <sup>1)</sup>
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50/60Hz (功率因数 0.95/0.6)			2.5 A / 1.6 A	6.3 A / 2.5 A	20.0 A / 3.0 A	2.0 A / 1.6 A	3.5 A / 2.0 A
switching cycles under rated current 开关寿命			10,000				
max. current at 250V 50/60Hz (power factor 0.95) 最大负载电流250V 50/60Hz(功率因数0.95)			10.0 A	12.0 A	30.0 A	10.0 A	20.0 A
switching cycles under max. current 最大负载电流下的开关寿命			300		600	300	1,000
temperature rating T <sub>a</sub> ( steps in 5 K ) 温度范围T <sub>a</sub> (每级5K)			(50) 70 °C... 180 °C <sup>2)</sup>		80 °C... 160 °C <sup>3)</sup>		
tolerances 公差			Standard 标准: ± 5 K				
feature of automatic action 自动动作特性			1.C.M, 2.C		2.B, 1.C, 3.C	1.B, 2.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 <sup>4) 5)</sup>				
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 <sup>2</sup> sine half wave / 100 m/s <sup>2</sup> 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 <sup>6)</sup> / -2-9				
	UL		UL 2111 / UL 873 <sup>1)</sup>				-
	CSA / cUL		C22.2 No. 77 / C22.2 No. 24 <sup>1)</sup>			-	-
	CQC		G14536.1-1998/GB14536.10-1996 <sup>1)</sup>				

1) details on request 按需求可提供详细资料

2) T10 max. T<sub>a</sub> 160°C 按T10最高温度为160°C

3) approval to EN60730-2-2 up to 180 °C 根据EN60730-2-2, 认证最高温度可达180°C

4) T10 available with ± 3K tolerances and smaller hysteresis T10能做到±3K的公差和更小的复归温度范围

5) at the T<sub>a</sub> (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

6) 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)

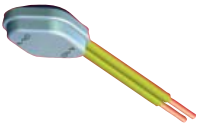
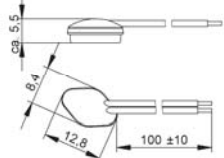
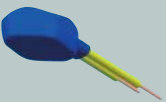
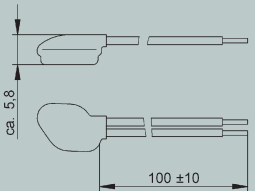

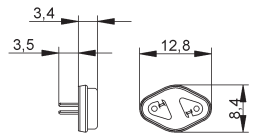

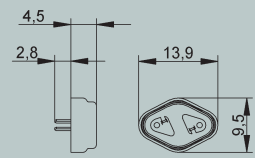

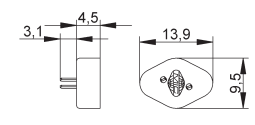
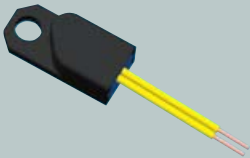
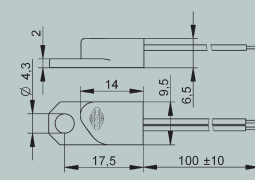
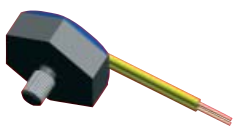
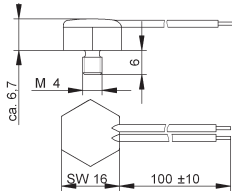
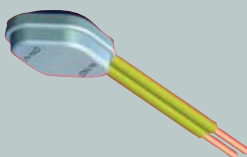
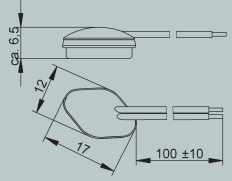
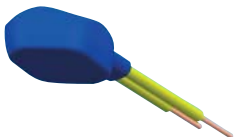
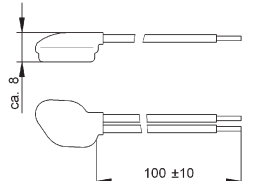
lead 引线	code 代码	temperature max. 耐最高温度	operating voltage max. 最高工作电压	diameter insulation 绝缘直径	cross section diameter <sup>2)</sup> 截面积	UL style UL类型
Stranded white 多支线 白色	L300	150 °C	300 V	1.57 mm	AWG24 / 0.24 mm <sup>2</sup>	3398
	L310			1.80 mm	AWG20 / 0.48 mm <sup>2</sup>	
	L320 <sup>1)</sup>			2.15 mm	AWG18 / 0.96 mm <sup>2</sup>	
	L330 / L360	200 °C / 250 °C	600 V	0.90 mm / 1.10 mm	AWG24 / 0.24 mm <sup>2</sup>	3557 / 10362
	L340 / L370			1.26 mm / 1.46 mm	AWG20 / 0.61 mm <sup>2</sup>	
	L350 <sup>1)</sup> / L380			1.50 mm / 1.68 mm	AWG18 / 0.96 mm <sup>2</sup>	
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	

<sup>1)</sup> T22 only 仅T22

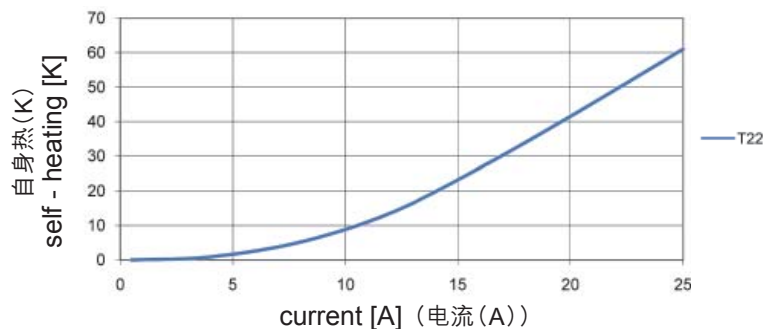
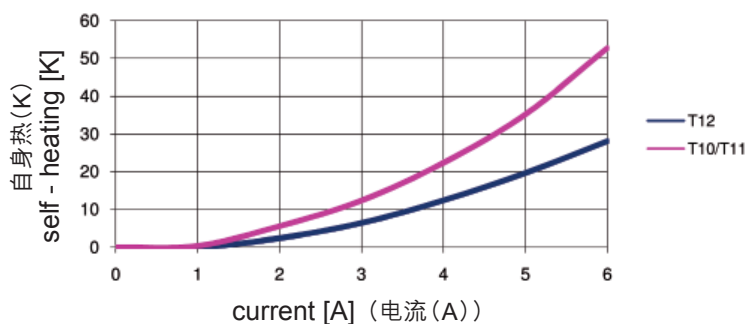
<sup>2)</sup> for T12/T11 AWG20 and for T10 AWG24 is recommended 对于T12 / T11推荐AWG20及T10推荐AWG24

## Standard insulation 标准绝缘

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
T10	A	B	U250			Shrink cap potted 收缩帽密封胶	VDE, UL, cUL
T11, T12	A						
T22	A	B					
T10	A	B	U174			Cap of PPS potted PPS帽密封胶	VDE, UL, cUL
T11, T12	A						

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
T10 T11, T12	A A	B		 type T11, T12 illustrated		no insulation potted 无绝缘密封胶	VDE, UL, cUL, CSA
T10 T11, T12	A A	B	U112			coated 涂层 T <sub>a</sub> max. 160 °C 最高限温160 °C	VDE, UL, cUL
T11, T12	A		A334			no insulation PCB connector grid dimension 5.08 无绝缘, PCB端子, 脚位尺寸5.08	VDE, UL, cUL
T11, T12	A		A334 U314			cap of PPS PCB connector grid dimension 5.08 PPS帽, PCB端子, 脚位尺寸5.08	VDE, UL, cUL
T11, T12	A		A334 U315			cap of PPS PCB connector grid dimension 5.08 PPS帽, PCB端子, 脚位尺寸5.08	VDE, UL, cUL
T10 T11, T12	A A	B	U293			housing of PPS potted PPS胶壳, 密封胶	VDE, UL, cUL
T10 T11, T12	E E	G	G502			potted aluminium housing anodized black M4x6 密封胶, 铝质封装, 黑色阳极电镀M4x6 T <sub>a</sub> max. 150 °C 最高限温150 °C	VDE, UL, cUL
T22	A	B				no insulation potted 无绝缘密封胶	VDE, UL, cUL, CSA
T22	A	B	U112			coated 涂层 T <sub>a</sub> max. 160 °C 最高限温160 °C	VDE, UL, cUL

## Heating by current 不同电流温升曲线



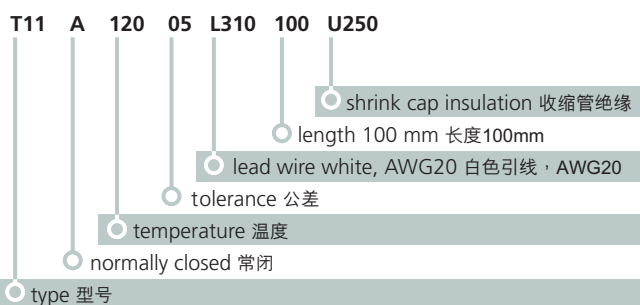
The characteristic curves in the diagrams are measured with a thermal control without any insulation in an oil bath. 该曲线图的量度是用一个不带任何绝缘的温控器在一个油缸中测得。

Attention:

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

- T11A** type 类型 (T11 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) :

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