

Thermal motor protector  
Temperature limiter  
Thermal cut-out

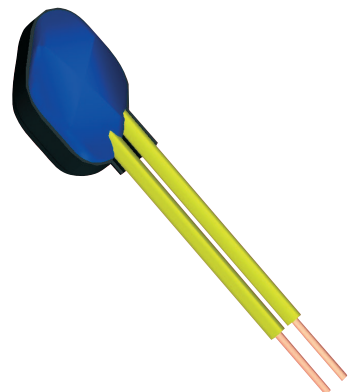
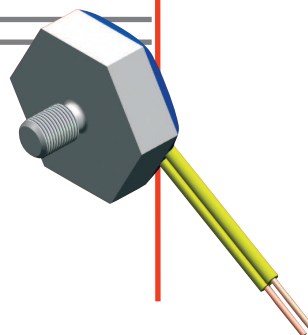
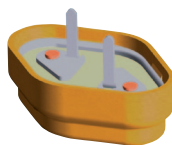
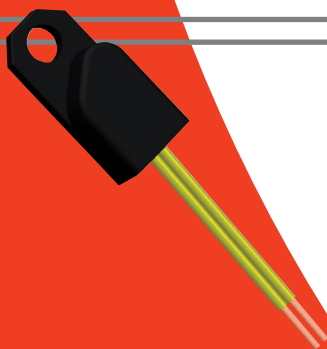
10  
11  
12  
22

## Applications

- Motors
- Transformers
- Coils
- Electronics, sensors

## Benefits

- Temperature and current sensitive or only temperature sensitive
- Small dimensions
- High power rating
- No vibration noise



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## Technical data

control type		T11A / E	T12A / E	T22A	T10B / G	T22B
ratings						
version		normally closed			normally open	
rated current at 250 V 50/60 Hz ( cos φ 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		10,000				
max. current under failure condition at 250 V 50/60 Hz ( cos φ 0.95 )		10.0 A	12.0 A	30.0 A	10.0 A	20.0 A
switching cycles under max. current		300		600	300	1,000
temperature rating T <sub>a</sub> ( steps in 5 K )		(50) 70 °C... 180 °C <sup>2)</sup>			80 °C ... 160 °C <sup>3)</sup>	
tolerances		Standard: ± 5 K				
feature of automatic action		1.C.M, 2.C		2.B, 1.C, 3.C	1.B, 2.C	
contact resistance ( incl. wire of 100 mm )		< 50 mΩ				
hysteresis		30 K ± 15 K <sup>4) 5)</sup>				
dielectric strength ( standard insulation )		2 kV				
shock / vibration testing ( similar to 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		tight against ordinary resins and lacquers				
degrees of protection provided by enclosures ( EN 60529 )		IP00				
suitable for use in protection category		I, II				
approvals	VDE / ENEC	EN 60730-1 / -2-9				
	UL	UL 2111 / UL 873 <sup>1)</sup>				-
	cUL	C22.2 No. 77 / C22.2 No. 24 <sup>1)</sup>				-
	CQC	GB14536.1-1998 / GB14536.10-1996 <sup>1)</sup>				

1) on request 2) T<sub>a</sub> up to 50°C on request 3) approval to EN60730-2-2 up to 180°C

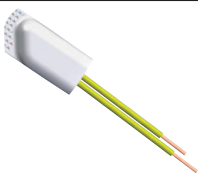
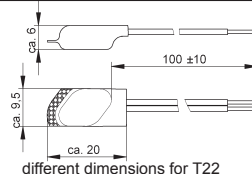

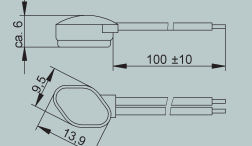
4) with ± 3 K tolerances and smaller hysteresis on request 5) at the T<sub>a</sub> (upper and lower) limits the hysteresis could deviate

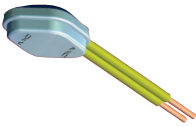
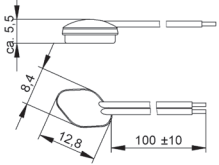
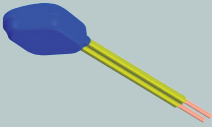
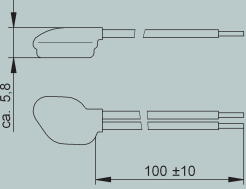

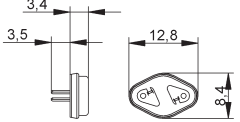

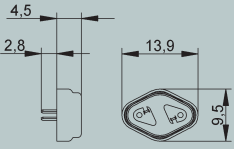

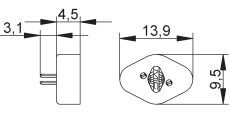
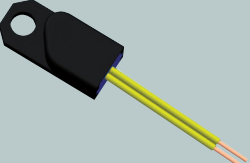
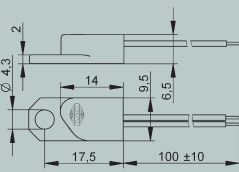
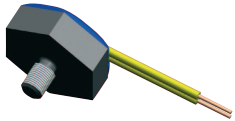
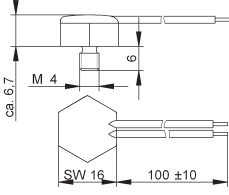
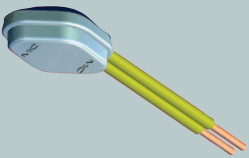
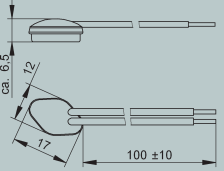
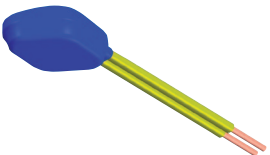
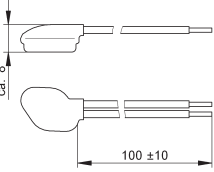
## Standard wire (length 100 ± 10 mm, stripped 6 ± 1 mm)

lead	code	temperature max.	operating voltage max.	approx. diameter insulation	approx. cross section diameter <sup>2)</sup>	UL style
stranded white	L300	150 °C	300 V	1.50 mm	AWG24 / 0.25 mm <sup>2</sup>	3398
	L310			1.82 mm	AWG20 / 0.50 mm <sup>2</sup>	
	L320 <sup>1)</sup>			2.10 mm	AWG18 / 1.00 mm <sup>2</sup>	
	L360	200 °C	600 V	1.20 mm	AWG24 / 0.25 mm <sup>2</sup>	10086
	L370			1.60 mm	AWG20 / 0.50 mm <sup>2</sup>	
	L380 <sup>1)</sup>			1.80 mm	AWG18 / 1.00 mm <sup>2</sup>	
solid yellow	L400	150 °C	300 V	1.35 mm	AWG24 / 0.50 mm	3398
	L410			1.66 mm	AWG20 / 0.80 mm	
	L430	200 °C	300 V	1.16 mm	AWG24 / 0.50 mm	1332
	L440			1.54 mm	AWG20 / 0.80 mm	

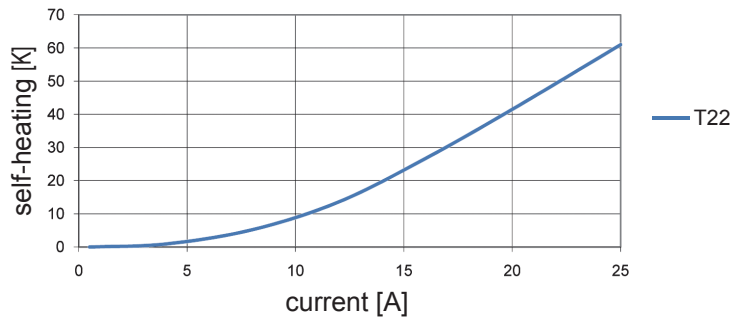
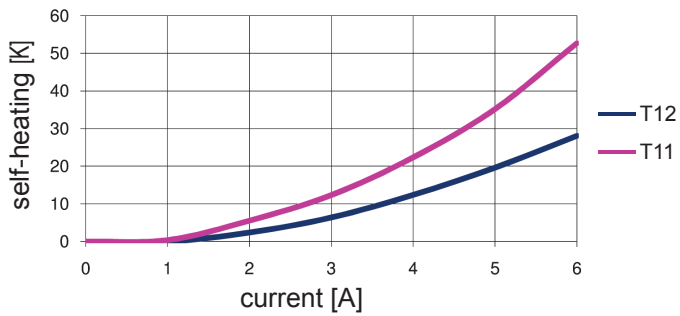
1) T22 only 2) for T12/T11 AWG20 and for T10 AWG24 is recommended

## Standard insulation

control type	nc	no	code	illustration	drawing dimensions ( mm )	technical specification	approvals
T10 T11, T12	A	B	U250			shrink cap potted	VDE, UL, cUL
T22	A	B	U256			cap of PPS potted	VDE, UL, cUL

control type	nc	no	code	illustration	drawing dimension (mm)	technical specification	approvals
T10 T11, T12	A	B		 type T11, T12 illustrated		no insulation potted	VDE, UL, cUL
T10 T11, T12	A	B	U112			coated T <sub>a</sub> max. 160 °C	VDE, UL, cUL
T11, T12	A		A334			no insulation PCB connector grid dimension 5.08	VDE, UL, cUL
T11, T12	A		A334 U314			cap of PPS PCB connector grid dimension 5.08	VDE, UL, cUL
T11, T12	A		A334 U315			cap of PPS PCB connector grid dimension 5.08	VDE, UL, cUL
T10 T11, T12	A	B	U293			housing of PPS potted	VDE, UL, cUL
T10 T11, T12	E	G	G502			potted aluminium housing anodized black M4x6 T <sub>a</sub> max. 150 °C	VDE, UL, cUL
T22	A	B				no insulation potted	VDE, UL, cUL
T22	A	B	U112			coated T <sub>a</sub> max. 160 °C	VDE, UL, cUL

## Heating by current



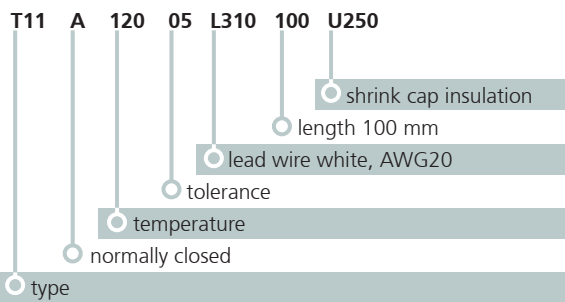
The characteristic curves are measured with a thermal control without any insulation in an oil bath.

Attention:

The heating depends on the thermal conduction of the control to the equipment or part which should be protected.

## Ordering and marking example

### Ordering example



### Marking

- T11A** type (T11 nc)
- 12005** response temperature (120°C), tolerance ( $\pm 5K$ )
- 051D** date of manufacture (May 2011), country (D=Germany)



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Deviations from standard controls on request.

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