

Thermal motor protector
Temperature limiter
Thermal cut-out

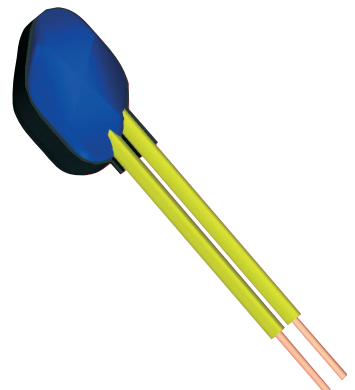
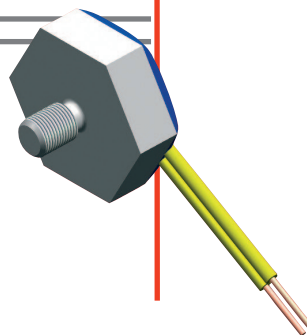
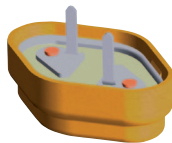
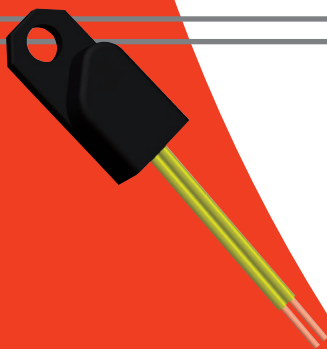
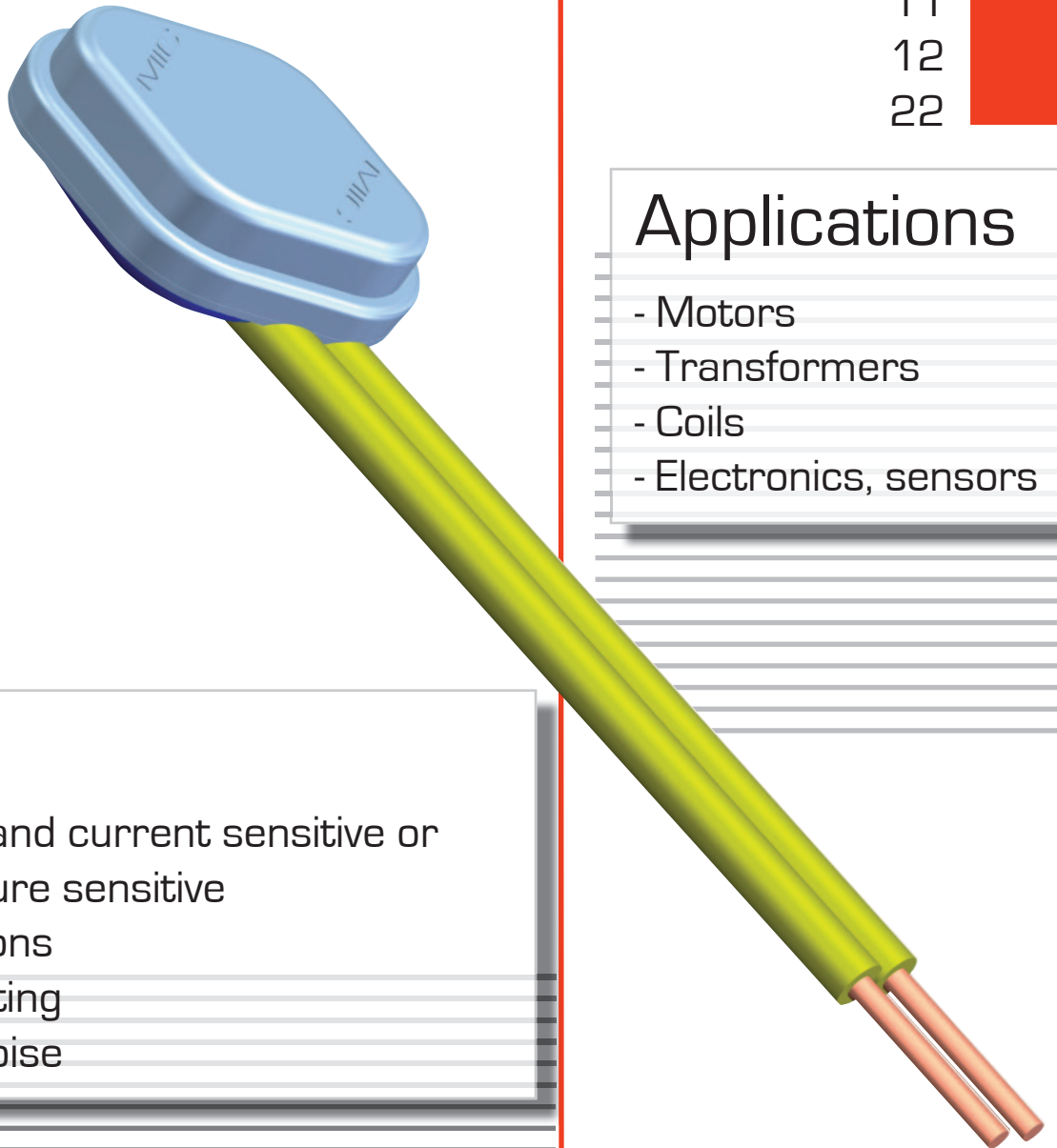
10
11
12
22

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 _a (steps in 5 K) | | (50) 70 °C... 180 °C ²⁾ | | | 80 °C ... 160 °C ³⁾ | |
| 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 ^{4) 5)} | | | | |
| dielectric strength (standard insulation) | | 2 kV | | | | |
| shock / vibration testing (similar to EN 50155) | | 400 m/s ² sine half wave / 100 m/s ² 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 ¹⁾ | | | | - |
| | cUL | C22.2 No. 77 / C22.2 No. 24 ¹⁾ | | | | - |
| | CQC | GB14536.1-1998 / GB14536.10-1996 ¹⁾ | | | | |

1) on request 2) T_a 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_a (upper and lower) limits the hysteresis could deviate

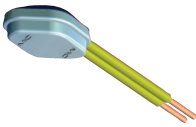
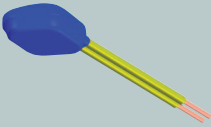
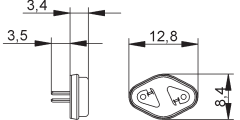
Standard wire (length 100 ± 10 mm, stripped 6 ± 1 mm)

| lead | code | temperature max. | operating voltage max. | approx. diameter insulation | approx. cross section diameter ²⁾ | UL style |
|----------------|--------------------|------------------|------------------------|-----------------------------|--|----------|
| stranded white | L300 | 150 °C | 300 V | 1.50 mm | AWG24 / 0.25 mm ² | 3398 |
| | L310 | | | 1.82 mm | AWG20 / 0.50 mm ² | |
| | L320 ¹⁾ | | | 2.10 mm | AWG18 / 1.00 mm ² | |
| | L360 | 200 °C | 600 V | 1.20 mm | AWG24 / 0.25 mm ² | 10086 |
| | L370 | | | 1.60 mm | AWG20 / 0.50 mm ² | |
| | L380 ¹⁾ | | | 1.80 mm | AWG18 / 1.00 mm ² | |
| 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 | |

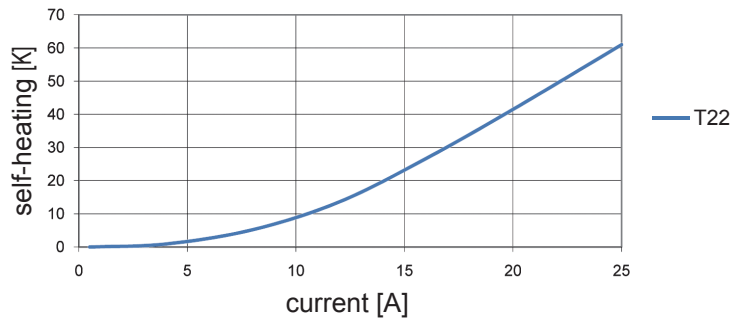
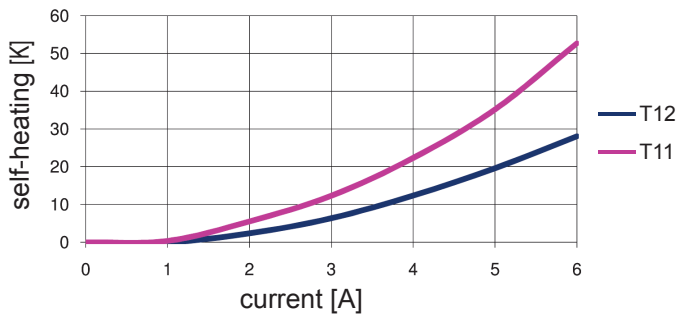
1) T22 only 2) for T12/T11 AWG20 and for T10 AWG24 is recommended

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 |
| T10 T11, T12 | A | B | U174 | | | 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 _a 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 _a max. 150 °C | VDE, UL, cUL |
| T22 | A | B | |  |  | no insulation potted | VDE, UL, cUL |
| T22 | A | B | U112 |  |  | coated T _a max. 160 °C | VDE, UL, cUL |

Heating by current



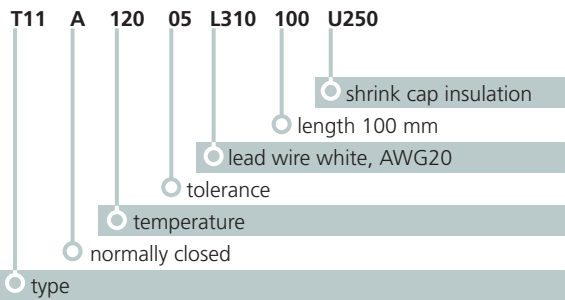
The characteristic curves are measured with a thermal control without any insulation in an oil bath.

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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