

Thermal motor protector
Temperature limiter
Thermal cut-out

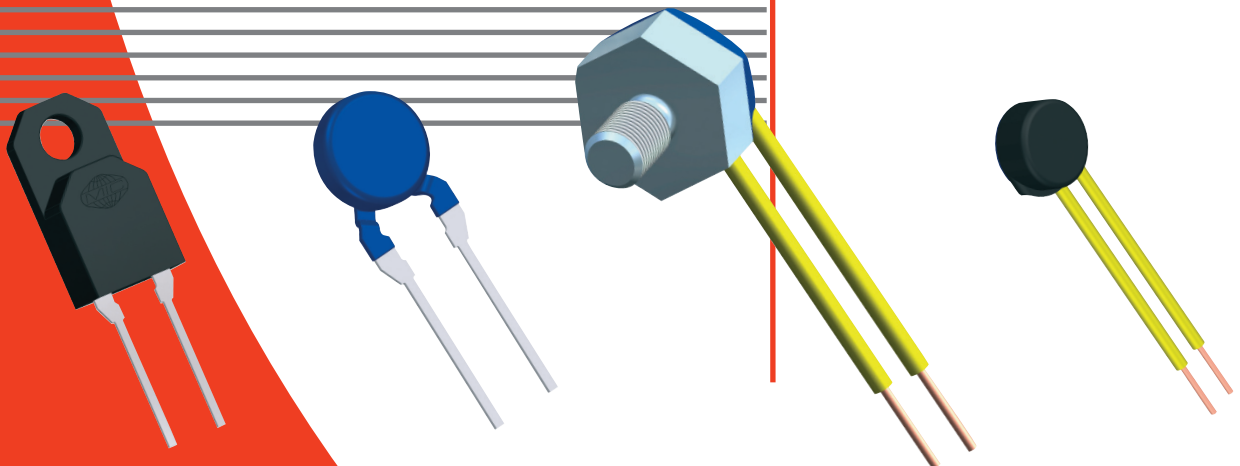
13
20
23

Applications

- Motors
- Transformers
- Coils
- Electronics, sensors





Benefits

- Small dimensions
- Shock and vibration tested
- Leadframe version
- Tested for audio, video applications (EN 60065)



CANTHERM

Technical data

| ratings | | control type | | | |
|--|------------|---|--|---------------|------------------|
| | | F20A / E | F13A ¹⁾ | F23A / E | F20B / G |
| version | | normally closed | | | normally open |
| rated current at 250 V 50/60 Hz (power factor 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 | | 7,000 | 10,000 | 10,000 | 7,000 |
| max. current under failure condition at 250 V 50/60 Hz (power factor 0.95) | | 4.0 A | | 5.0 A | 4.0 A |
| switching cycles under max. current | | 3,000 | | | |
| temperature rating T _a (steps in 5 K) | | 70 °C ... 190 °C | | | 70 °C ... 185 °C |
| tolerances | | standard: ± 5 K | | | |
| feature of automatic action | | 1.B, 2.B.M, 1.C | | | 2.B, 1.C |
| contact resistance (incl. wire of 100 mm) | | < 50 mΩ | | | |
| hysteresis | | 30 K ± 15 K ²⁾ | | | |
| 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 File Number E46827 | | |
| | cUL |  | C22.2 No. 77 / C22.2 No. 24 ¹⁾ | | |
| | CQC |  | GB14536.1-1998 / GB14536.10-1996 ³⁾ | | |

¹⁾ details on request

²⁾ at the T_a (upper and lower) limits the hysteresis could deviate

³⁾ different power rating

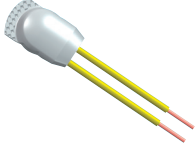
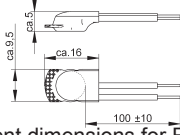
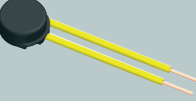
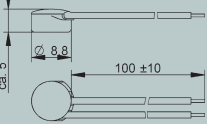
Standard wire (length 100 ± 10 mm, stripped 6 ± 1 mm)

| Cantherm lead | Cantherm code | temperature max. | operating voltage max. | diameter insulation | cross section diameter ¹⁾ | UL style |
|---------------------|---------------|------------------|------------------------|---------------------|--------------------------------------|-----------|
| black | ACFA | 150 °C | 300 V | 1.57 mm | AWG24 / 0.24 mm ² | 3266/3398 |
| yellow | AEFC | | | 1.80 mm | AWG20 / 0.48 mm ² | |
| black | KCFA | 200 °C | 600 V | 1.2 mm | AWG24 / 0.25 mm ² | 10086 |
| black | KEFA | | | 1.6 mm | AWG20 / 0.50 mm ² | |
| black ²⁾ | ASFA | 150 °C | 300 V | 1.65 mm | AWG20 / 0.81 mm | 3266/3398 |
| white | DCFB | 200 °C | 300 V | 1.21 mm | AWG24 / 0.51 mm | 1180 |
| white | DEFB | | | 1.51 mm | AWG20 / 0.81 mm | |

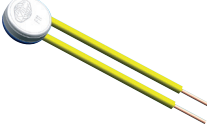
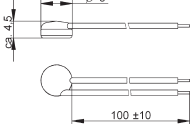
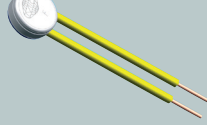
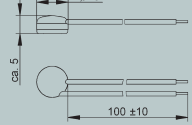

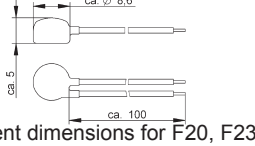
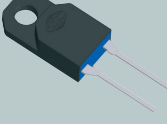
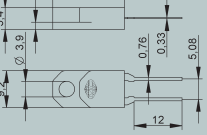

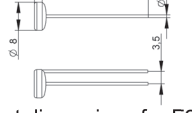
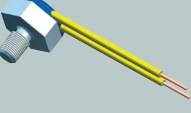
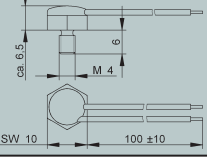
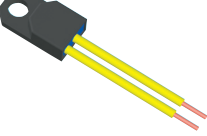
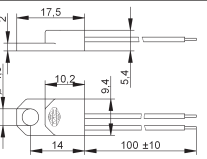
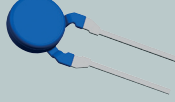
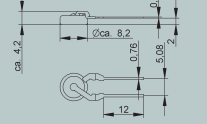
¹⁾ AWG24 is recommended ²⁾ Solid Wire

Note: Additional wires available upon request.

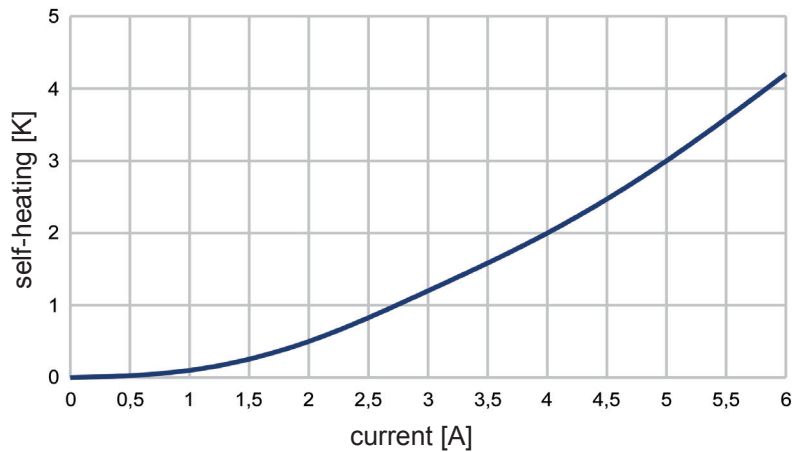
Standard insulation

| control type | nc | no | Cantherm code | illustration | drawing dimensions (mm) | technical specification | approvals |
|-----------------|--------|-------|----------------------|---|---|-------------------------|--------------|
| F13 F20, F23 | A A | B | U102 B U106 F |  |  different dimensions for F20, F23 | shrink cap potted | VDE, UL, cUL |
| F13 F20, F23 | A A | B | U198 U185 |  |  different dimensions for F20, F23 | cap of PPS potted | VDE, UL, cUL |

Specific variations

| control type | nc | no | Cantherm code | illustration | drawing dimensions (mm) | technical specification | approvals |
|-----------------|--------|-------|-------------------------------------|---|---|--|-------------------|
| F13 | A | | Insulation None 0 |  |  | not insulated potted | VDE, UL, cUL |
| F20, F23 | A | B | Insulation None 0 |  |  | not insulated potted | VDE, UL, cUL, CSA |
| F13 F20, F23 | A A | B | Insulation U112 L |  |  different dimensions for F20, F23 | coated | VDE, UL, cUL |
| F20, F23 | A | B | Housing G410 6 Leads A150 36 |  |  | housing of PPS leadframe leads grid dimension 5.08 potted | VDE, UL, cUL, CSA |
| F13 F20, F23 | A A | B | Leads A800 IZA |  |  different dimensions for F20, F23 | not insulated potted | VDE, UL, cUL |
| F20, F23 | E | G | G700 B |  |  | aluminium housing thread M4x6 potted T _a max. 150 °C | VDE, UL, cUL, CSA |
| F13 | A | | G410 6 Leads ACFA |  |  | housing of PPS potted | VDE, UL, cUL |
| F13 F20, F23 | A A | B | A150 36 U112 L |  |  different dimensions for F20, F23 | leadframe leads grid dimension 5.08 coated | VDE, UL, cUL, CSA |

Heating by current



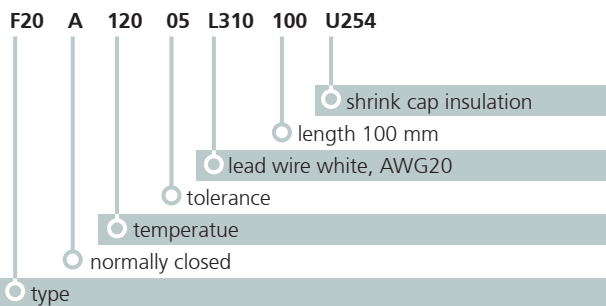
The characteristic curve in the diagram is measured with a thermal control without any insulation in an oil bath.

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 (Microtherm)



Deviations from standard controls on request.

Marking

F20A type (F20 nc)

12005 response temperature (120°C), tolerance ($\pm 5K$)

049D date of manufacture (April 2009), country (D=Germany)

Cantherm Ordering Example [F20A12005ACFA06E]

| F20 | A | 120 | 05 | AC | F | A | 0 | 6 | E |
|------|--------------|-------|---------------------|--------------------------------------|------------------------|----------------|------------------|--------------------------|---------------|
| type | Norm. Closed | Temp. | tolerance +/-5°C | wire leads UL3398 24 AWG | lead length F=6" | color black | no insulation | housing - G410 E06 | strip .25" |

Marking

F20A type (F20 nc)

12005 response temperature (120°C), tolerance ($\pm 5K$)

065C date of manufacture (June 2015), country (C = Canada)



CANTHERM™

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