

Thermal motor protector
Temperature limiter
Thermal cut-out

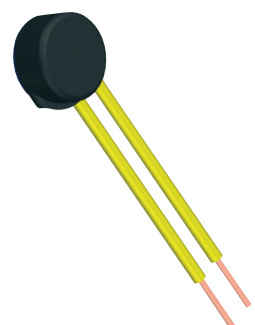
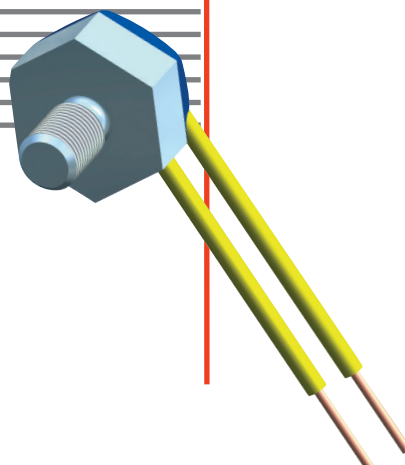
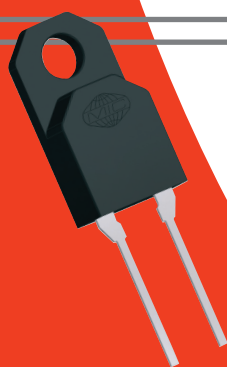
13
20
23

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

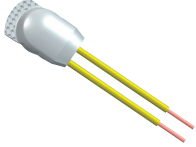
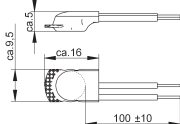
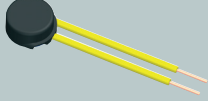
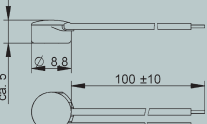
³⁾ different power rating

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

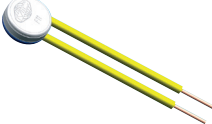
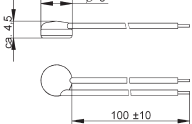
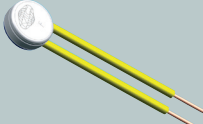
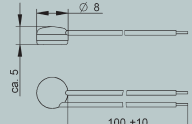
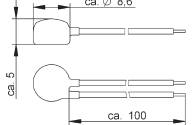
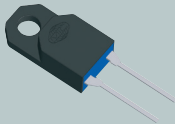
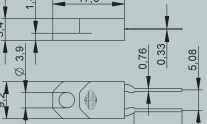
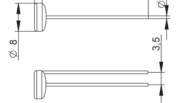
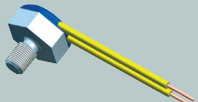
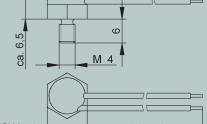
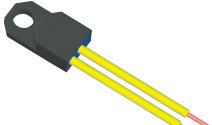
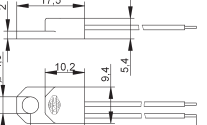
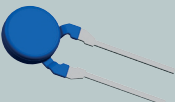
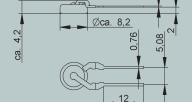
Cantherm lead	Cantherm code	temperature max.	operating voltage max.	diameter insulation	cross section diameter ¹⁾	UL style
black	ACFA	150 °C	300 V	1.57 mm	AWG24 / 0.24 mm ²	3266/3398
yellow	AEFC			1.80 mm	AWG20 / 0.48 mm ²	
black	KCFA	200 °C	600 V	1.2 mm	AWG24 / 0.25 mm ²	10086
black	KEFA			1.6 mm	AWG20 / 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

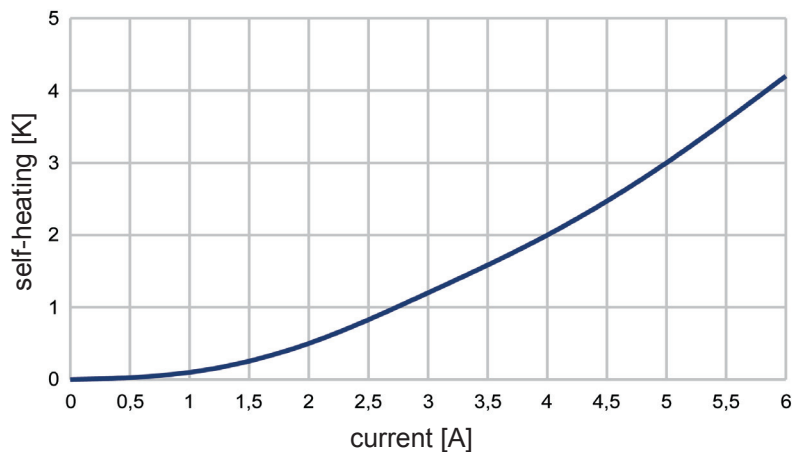
Note: Additional wires available upon request.

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			alluminium 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



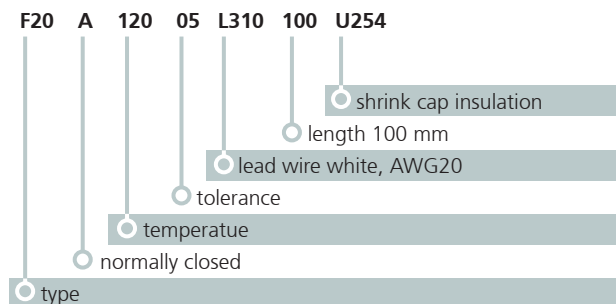
The characteristic curve in the diagram is measured with a thermal control without any insulation in an oil bath.

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 $\pm 5^\circ\text{C}$	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)



CANTHERMTM

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