

Thermal motor protector
Temperature limiter
Thermal cut-out



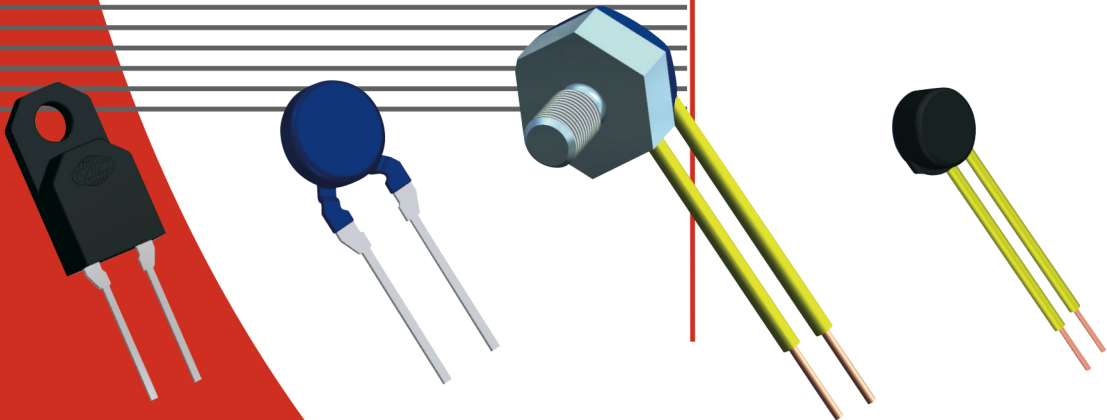
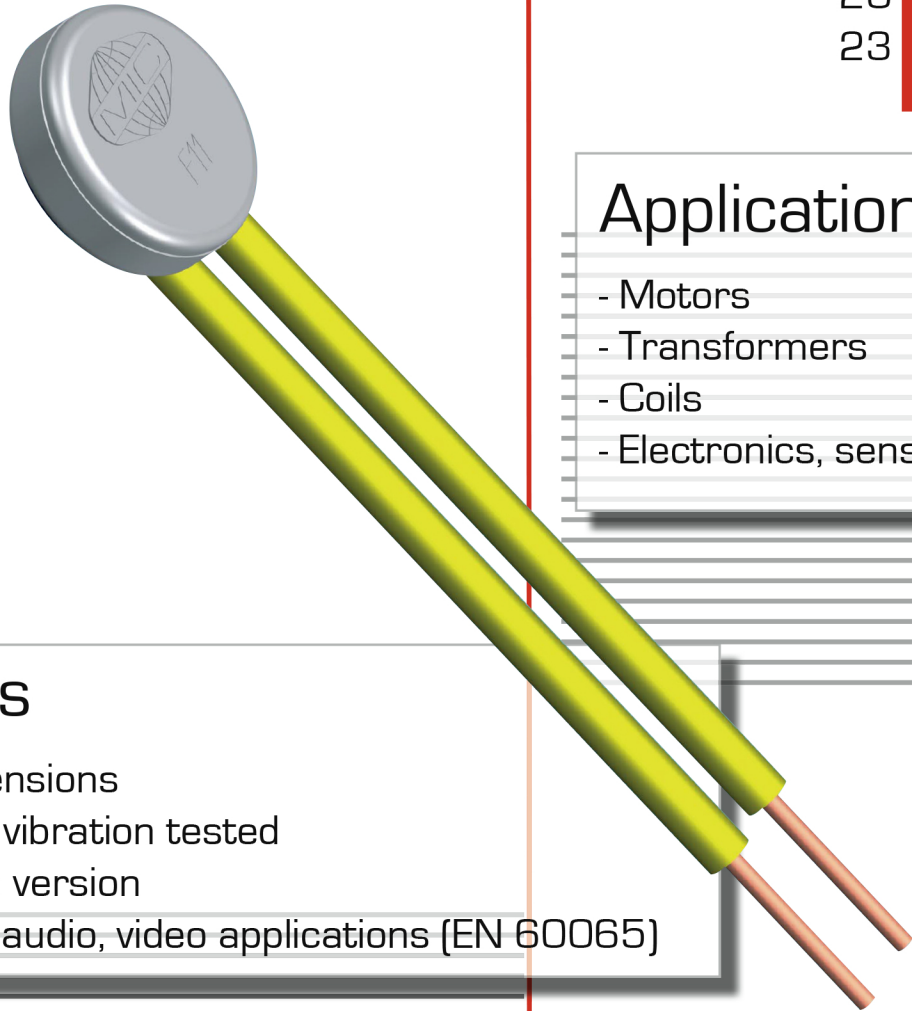
13
20
23

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	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 ... 160 °C			70 °C ... 155 °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 2111 / UL 873 ¹⁾			
	CSA / cUL	C22.2 No. 77 / C22.2 No. 24 ¹⁾			
	CQC	GB14536.1-1998 / GB14536.10-1996 ¹⁾			

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


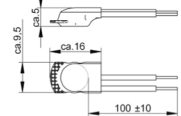

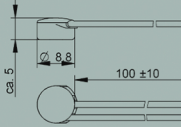
Standard wire (length 100 ± 10 mm, stripped 6 ± 1 mm)

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	
white	LCFB	200 °C	600 V	0.90 mm	AWG24 / 0.24 mm ²	3557
white	LEFB			1.26 mm	AWG20 / 0.61 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	

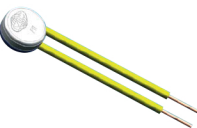
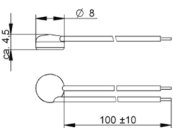
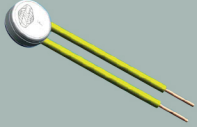
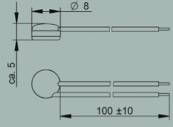

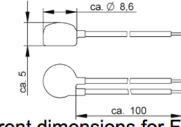
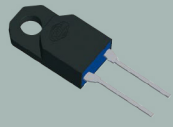
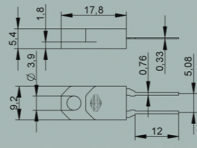

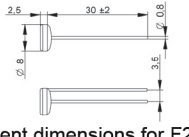
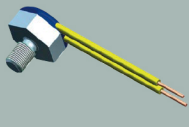
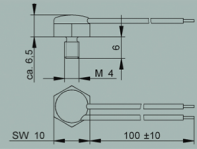
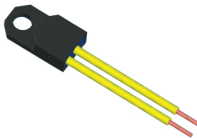
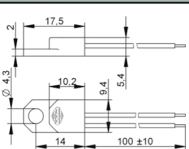
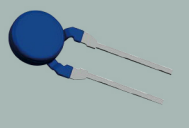
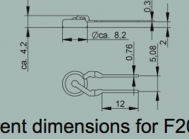
¹⁾ AWG24 is recommended ²⁾ Solid Wire

NOTE: Additional wires available upon request.

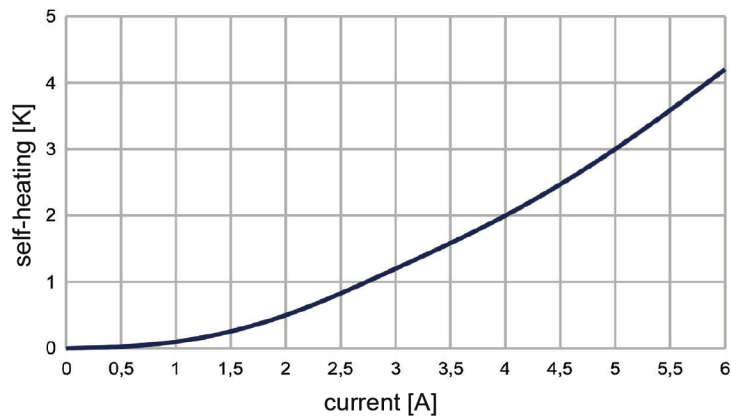
Standard insulation

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			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



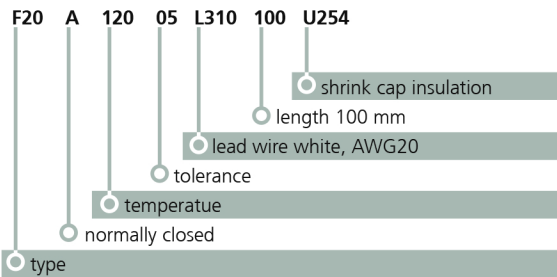
The characteristic curve in the diagram is measured with a thermal control without any insulation in an oil bath.

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 Example (Microtherm)

- F20A** type (F20 nc)
- 12005** response temperature (120°C), tolerance (± 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 Example (Cantherm)

F20A type (F20 NC)

12005 response temperature (120°C), tolerance (± 5K)

112C date of manufacture (Nov. 2012), country (C = Canada)



CANTHERMTM

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