

Thermal motor protector

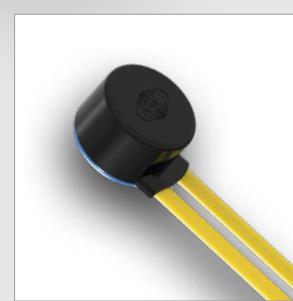
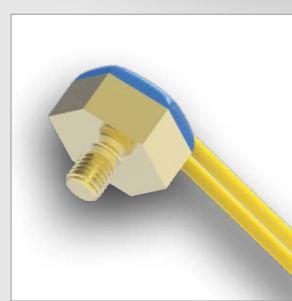
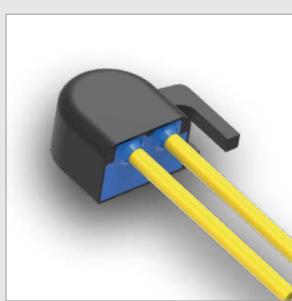
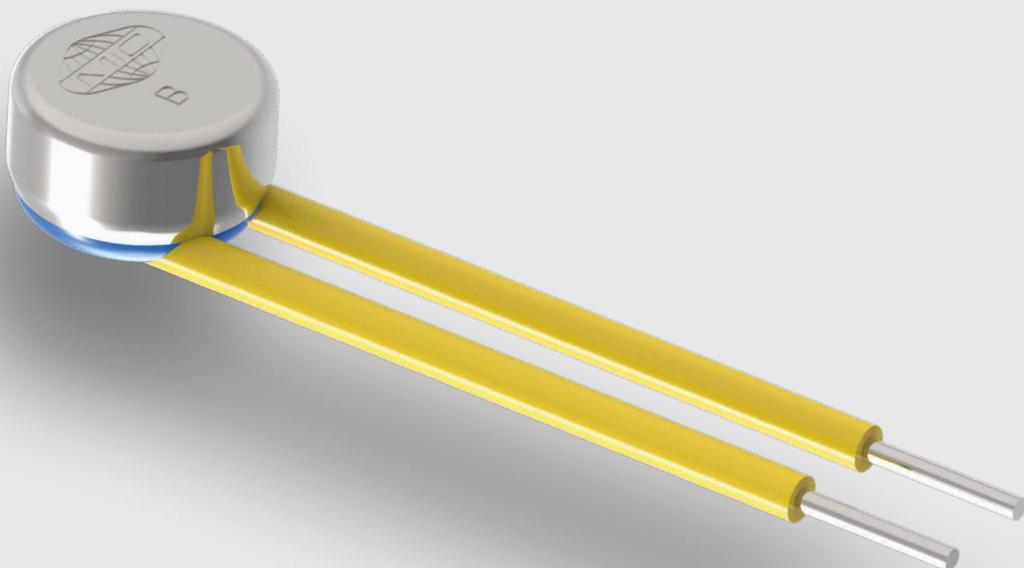
Temperature limiter

Thermal cut-out

B

12

13



**Applications**

- Motors
- Transformers
- Coils
- Electronics, sensors
- Process automation

**Benefits**

- Non-sensitive to current
- High current rating up to 30 A
- Manifold executions
- Special low voltage execution

## Description

Type **series B** switches have a thermo-bimetallic snap-disc with a fixed switching temperature as the switching element. In the case of an external temperature input, the **double contact system of the switch**, and thus the circuit of the application is opened or closed. The heat transfer is performed from all sides onto the housing of the switch by means of convection, or direct heat conduction.

B12 switches are universally applicable through their design, their **wide range of performance**, and their diverse range of designs: as a protective switch, sensor, controller.

Especially applications in the area of temperature sensors with low voltage and signal currents require **gold plated contacts** which is available in our B13 series.

Beside the standard counters in single implementation the protectors are also offered in **twin and triplet configuration**.



## Technical data

type ratings		control		
		B12A / E	B12B / G	B13N / T
version		normally closed		normally closed/open
rated current at 250 V 50/60 Hz ( power factor 0.95 / 0.6 )		10.0 A / 6.0 A	13.0 A / 6.0 A	5.0 A / 1.6 A
switching cycles under rated current		10,000	1,000	5,000
max. current under failure conditions at 250 V 50/60 Hz ( power factor 0.95 )		30.0 A		-
switching cycles under max. current		100		-
temperature rating $T_A$ ( steps in 5 °C )		70 °C ... 190 °C	70 °C ... 160 °C	70 °C ... 185 °C
tolerances		Standard: $\pm 5$ °K		
feature of automatic action		1.B, 2.B, 1.C		1.B
contact resistance ( incl. wire of 100 mm )		< 50 mΩ		
hysteresis		30 °K $\pm 15$ °K <sup>1)</sup>		
dielectric strength ( standard insulation )		2 kV		-
vibration resistance (10 to 60 Hz)		100 m/s <sup>2</sup>		
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>2)</sup>	
	CSA / cUL		C22.2 No. 77 / C22.2 No. 24 <sup>2)</sup>	
	CQC		GB14536.1-1998 / GB14536.10-1996 <sup>2)</sup>	

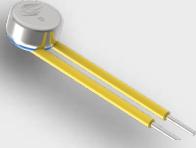
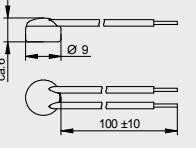
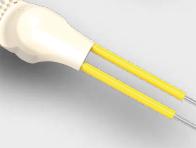
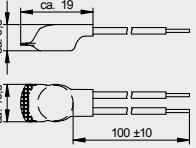
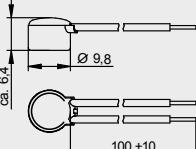
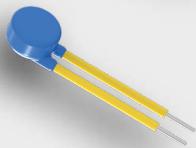
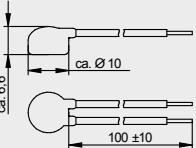
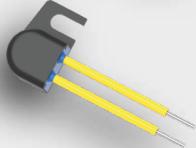
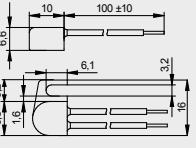
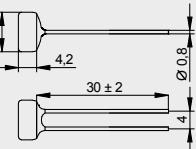
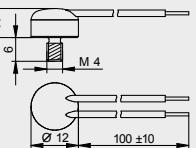
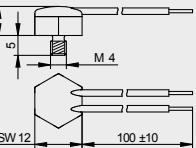
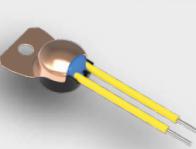
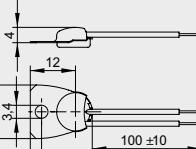
<sup>1)</sup> at the  $T_A$  (upper and lower) limits the hysteresis could deviate, for  $T_A > 130$  °C the hysteresis is 30 °K -15 °K/+30 °K. <sup>2)</sup> on request

The variety of our product variations is nearly infinite. Microtherm distinguishes itself by a high expert's know-how in the area of customised developments. We will be pleased to give you specific advice during a personal consultation and present you all the options suitable for your application:

- application of plug connectors
- unique packaging and overmolding variations
- specific cable assemblies and many more



## Varianten

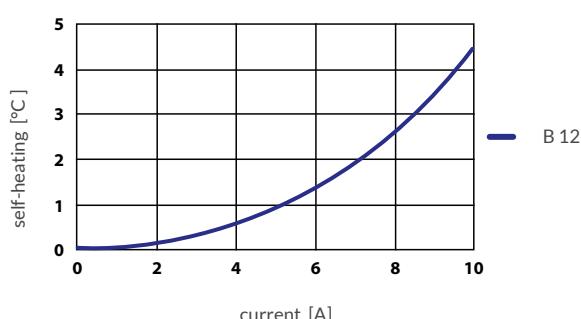
control type	n.c.	n.o.	code	illustration	drawing dimensions ( mm )	technical specification	approvals ( only for B12 )
B12	A	B				not insulated potted	VDE, UL, cUL, CSA
B13	N	T				shrink cap potted	VDE, UL, cUL
B12	A	B	U186			cap of PPS potted	VDE, UL, cUL
B13	N	T	U112			coated T <sub>A</sub> max. 160°C	VDE, UL, cUL
B12	A	B	U294			housing of PPS potted T <sub>A</sub> max. 160°C	VDE, UL, cUL
B13	N	T	A800			not insulated potted	VDE, UL, cUL
B12	E	G	G402			aluminium housing thread M4x6 potted T <sub>A</sub> max. 150 °C	VDE, UL, cUL
B13	N	T	G714			brass housing thread M4x5 potted T <sub>A</sub> max. 150 °C	VDE, UL, cUL
B12	A	B	B245			CuBe mounting cap combined with U186 / U112	VDE, UL, cUL
B13	N	T					

## Standard wire

lead	code	temperature max.	operating voltage max.	approx. diameter-insulation	approx. cross section / diameter	UL style
stranded white	L300 <sup>1)</sup>	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			2,10 mm	AWG18 / 1,00 mm <sup>2</sup>	
	L360 <sup>1)</sup>	200 °C	600 V	1,10 mm	AWG24 / 0,25 mm <sup>2</sup>	10086
	L370			1,50 mm	AWG20 / 0,50 mm <sup>2</sup>	
	L380			1,70 mm	AWG18 / 0,82 mm <sup>2</sup>	
solid yellow	L410	150 °C	300 V	1,66 mm	AWG20 / 0,80 mm	3398
	L440	200 °C	300 V	1,54 mm	AWG20 / 0,80 mm	1332

Standard length 100 ± 10 mm, stripped 6 ± 1 mm, AWG20 is recommended <sup>1)</sup> B13 only

## Heating by current



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

Note:

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

## Ordering example

B12 A 120 05 L310 300 U253

## Marking

<b>B12A</b>	type (B12 n.c.)
<b>12005</b>	response temperature (120°C), tolerance (± 5°C)
<b>101D</b>	date of manufacture (October 2021), country (D=Germany)

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