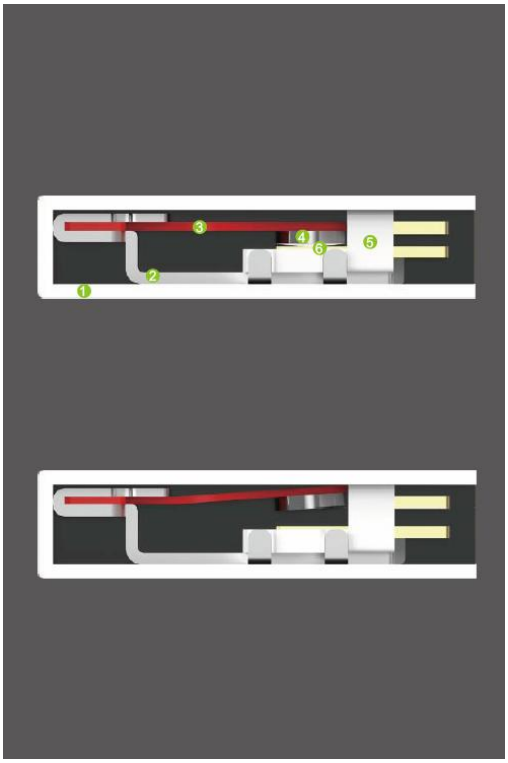
BW-B Series Thermal Protectors



Main parts

1) Shell
2) Iron bracket
3) Bimetal disc
4) Movable contact
5) Base
6) Stationary silver contact

Construction

The movable contact is welded to the bimetal disc, which is then welded to the iron bracket. The stationary silver contact and the base are molded into a single unit, which is riveted to the iron bracket. The electric current first flows through the movable contact on the bimetal disc via the iron bracket, and then through the stationary silver contact to complete the circuit.

Function

Under normal conditions, the movable contact is pressed against the stationary silver contact by the pre-tension of the bimetal disc. When the rated operating temperature is reached, the bimetal disc deforms due to heat and snaps rapidly, breaking the circuit. As the device cools down and reaches the defined reset temperature, the bimetal disc and the spring snap back to their original position, the contacts close again, and the device resumes operation.

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BW-B_P

6A Series | **45°C ... 160°C**

Version	NO / NC (UL)	Nominal switching temp. (NST) in 5K steps	45°C ... 130°C
Reset	automatic	Tolerance	±5K
Insulation	Metal housing / shrink tube isolation	Hysteresis	See datasheet
Width	7.0mm	Rated voltage AC	250V
High	3.5mm	Rated current AC cos ϕ = 1.0 / Cycles	6A / 6.000
Length	15.0mm	Rated voltage DC	24V
Impregnating resistance	suitable	Rated current DC / Cycles	6A / 10.000
Pressure resistance of the switch housing	98N	Contact resistance	< 50mΩ
Standard connection	Lead wire 0.34mm² / AWG 22	Dielectric strength	AC 1.5 kV / 1 minute
Approval	VDE (130°C), UL, CQC, CB, GB, KC	Insulation resistance	> 100MΩ
Link to product site	https://www.alpha-therm.com/en/produkt/bw-b-series/		

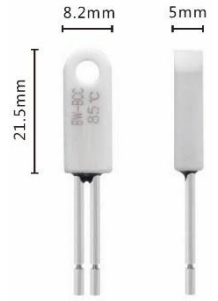
BW-B_M

6A Series | **45°C ... 160°C**

Version	NO / NC (UL)	Nominal switching temp. (NST) in 5K steps	45°C ... 160°C
Reset	automatic	Tolerance	±5K
Insulation	Metal housing / shrink tube isolation	Hysteresis	See datasheet
Width	6.8mm	Rated voltage AC	250V
High	3.6mm	Rated current AC cos ϕ = 1.0 / Cycles	6A / 6.000
Length	22.0mm	Rated voltage DC	24V
Impregnating resistance	suitable	Rated current DC / Cycles	6A / 10.000
Pressure resistance of the switch housing	200N	Contact resistance	< 50mΩ
Standard connection	Lead wire 0.34mm² / AWG 22	Dielectric strength	AC 1.5 kV / 1 minute
Approval	VDE, UL, CQC, CB, GB, KC	Insulation resistance	> 100MΩ
Link to product site	https://www.alpha-therm.com/en/produkt/bw-b-series-kopie/		

BW-B_C

6A Series | **Ceramic Case** | **45°C ... 160°C**



Version	NO / NC (UL)	Nominal switching temp. (NST) in 5K steps	45°C ... 160°C
Reset	automatic	Tolerance	±5K
Insulation	Ceramic Case M4 screw hole	Hysteresis	See datasheet
Width	8.2mm	Rated voltage AC	250V
High	5.0mm	Rated current AC cos ϕ = 1.0 / Cycles	6A / 6.000
Length	21.5mm	Rated voltage DC	24V
Impregnating resistance	suitable	Rated current DC / Cycles	6A / 10.000
Pressure resistance of the switch housing	N.A.	Contact resistance	< 50mΩ
Standard connection	Lead wire 0.34mm² / AWG 22	Dielectric strength	AC 1.5 kV / 1 minute
Approval	VDE, UL, CQC, CB, GB, KC	Insulation resistance	> 100MΩ
Link to product site	https://www.alpha-therm.com/en/produkt/bw-b-series-kopie-kopie-kopie/		

BW-B_ME

6A Series | **45°C ... 160°C**

Version	NO / NC (UL)	Nominal switching temp. (NST) in 5K steps	45°C ... 160°C
Reset	automatic	Tolerance	±5K
Insulation	Metal housing / epoxy isolation	Hysteresis	See datasheet
Width	7.5mm	Rated voltage AC	250V
High	4.2mm	Rated current AC cos ϕ = 1.0 / Cycles	6A / 6.000
Length	22.0mm	Rated voltage DC	24V
Impregnating resistance	suitable	Rated current DC / Cycles	6A / 10.000
Pressure resistance of the switch housing	200N	Contact resistance	< 50mΩ
Standard connection	Lead wire 0.34mm² / AWG 22	Dielectric strength	AC 1.5 kV / 1 minute
Approval	VDE, UL, CQC, CB, GB, KC	Insulation resistance	> 100MΩ
Link to product site	https://www.alpha-therm.com/en/produkt/bw-b-series-kopie-kopie/		

Order Code (wire specification can be customized)

BW-B - C M . 125 . 05 . 100-5/100-5

- Type
- Function
  - C = Normally Close (NC)
  - O = Normally Open (NO)
- Design: P, M, C, ME
- Nominal switching temp. (°C): see table
- Tolerance (K): see table
- Wire length (mm) (100-5 = 100mm, 5mm semi-strip) — L1 L2

Standard connection wires

Isolation material	Max. Temp.	Max. operating voltage	Size	UL-Style
XLPE	125°C	300V	AWG 22	3266
Silicone	200°C	600V	AWG 22	3135

Up to 125°C, white XLPE wires in AWG 22 used as standard. (UL3266)
Above 125°C, red Silicone wire in AWG 22 used as standard. (UL3135)

Errors and omissions excepted

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Available switching & reset temperatures

Switching °C	Reset °C
35 ± 5 K	≥ 25
40 ± 5 K	≥ 30
45 ± 5 K	≥ 33
50 ± 5 K	≥ 35
55 ± 5 K	42 ± 6 K
60 ± 5 K	45 ± 8 K
65 ± 5 K	48 ± 10 K
70 ± 5 K	50 ± 12 K
75 ± 5 K	53 ± 14 K
80 ± 5 K	55 ± 15 K
85 ± 5 K	60 ± 15 K
90 ± 5 K	65 ± 15 K
95 ± 5 K	70 ± 15 K

Switching °C	Reset °C
100 ± 5 K	70 ± 15 K
105 ± 5 K	75 ± 15 K
110 ± 5 K	75 ± 15 K
115 ± 5 K	80 ± 15 K
120 ± 5 K	85 ± 15 K
125 ± 5 K	85 ± 15 K
130 ± 5 K	90 ± 15 K
135 ± 5 K	95 ± 15 K
140 ± 5 K	100 ± 15 K
145 ± 5 K	100 ± 15 K
150 ± 5 K	105 ± 15 K
155 ± 5 K	110 ± 15 K
160 ± 5 K	115 ± 15 K

Electric strength
When the product is in the breaking state, the lead wires should be able to withstand AC500V lasting for 1min without breakdown or flash-over;
The part between the lead wires and the case should be able to withstand AC 1500V lasting for 1min without breakdown or flash-over.

Insulation resistance
Under normal conditions, the insulation resistance between leads (terminal) and case should be more than 100MΩ measured by ohmmeter of DC 500V.

Contact resistance
The contact resistance of standard lead wire length 55mm products should be lower than 50mΩ.

Tensile resistance test
Terminal & leads should endure more than 30N axes direction pull lasting for 1 minute without break or looseness.

High temperature test
Keep the thermal protector in an incubator which temp. is 20K higher than its rated switching temperature for sixteen hours, and test it two hours later after taking out from the incubator, while the temperature change does not exceed the initial value of ± 5K or ± 5%, returns the maximum value.

Low temperature resistance test
Keep the thermal protector in a -40°C incubator for ninety six hours, and test it two hours later after taking out from the incubator, while the temperature change does not exceed the initial value of ± 5K or ± 5%, returns the maximum value.

Anti-Vibration test
Thermal protector should be able to withstand the amplitude 1.5mm, frequency 10-55Hz, scanning change cycles of 3-5 times/min. The vibration direction X, Y, Z and each direction vibrates on a continuous basis for 2 hours while the temperature change does not exceed the initial value of ±5K or ±5%, returns the maximum value.

Short-circuit limit test
When the thermal protector is in series connection with RL1-15A fuse to withstand short circuit current limit of 200A, it should not cause the cotton burned which is wrapped on the thermal protector.

Drop test
Let the thermal protector fall free in the cement or other solid surface from a height of 700mm, its temperature performance should not exceed the initial value of ± 5K or ± 5% (take the larger from the two values).

Product disconnection bounce time
Bounce Time < 1ms.

Action temperature testing / temperature rising rate
For action temperature testing, temperature rising rate should be controlled at 1°C/min and use indicator light to show the on/off state. The testing current should be no more than 0.01A.

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