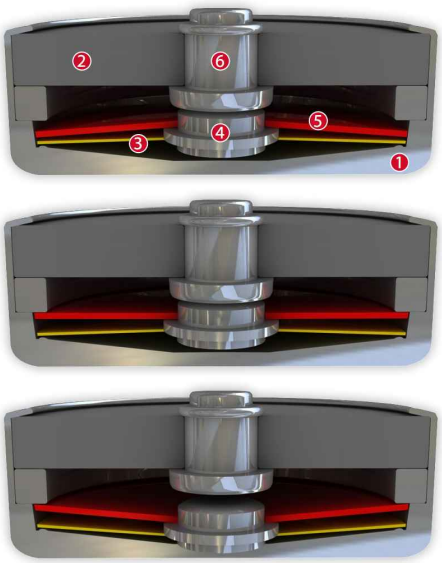
thermik®

# DATASHEET

## Thermal Protector SP1

## Type series P1




### Construction and function

The switchgear of type series P1 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a PTC cap made from barium titanate (2) which sticks out from a stationary silver contact (6). At the same time, the spring snap-in disc (3) which forms the current transfer element bears the movable contact (4) and discharges the flow of current and self-heating from the bimetallic disc (5). The bimetallic disc (5) is held on the movable contact (4) which sticks out through this without having to be welded or fixed. When the rated switching temperature is reached, the bimetallic disc (5) snaps into its inverted position and pushes the spring snap-in disc (3) downwards. The contact is abruptly opened and the temperature rise of the device to be protected is disrupted. The PTC resistance (2) connected in parallel now sustains the operating voltage and deploys a defined electrical heating output on the bimetallic disc (5) regardless of the ambient temperature and permanently sustains it above its springback temperature so that the switch gear cannot reset. The contact remains open. The Thermal protectors can only cool down again and switch to the original closed state when the external operating voltage is no longer applied and/or disconnection from the mains.


### Features:

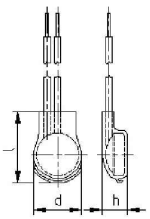
| | |
|---|---|
| Very compact and flat design | |
| Quick response sensitivity | featured by the metal housing and small protector mass |
| Excellent long term performance | due to fine silver contacts. Reproducible switching temperature values due to tempered, electrically and mechanically unstressed bimetallic disc and by use of temperature resistant materials |
| Instantaneous switching | with always constant contact pressure up to the nominal switching point, resulting in low contact stress |
| Very short bounce times | < 1 ms |
| Self regulating PTC- heating resistor | enables rated switching temperatures up to 180 °C, due to a very small overshooting of the temperature effected by RH |

## Technical Data Type SP1

The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

**SP1**

*Type: Normally closed; does not reset automatically; voltage applied; with connector cables; insulation: Mylar®-Nomex®*


| | |
|---|---|
| Diameter d | 9,4 mm |
| Installation height h | from 4,9 mm |
| Length of the insulation cap l | 15,0 mm |

| | | |
|---|---|---|
| Nominal switching temperature (NST) in 5 °C increments | | 70 °C - 180 °C |
| Tolerance (standard) | | ±5 K |
| Reverse switch temperature (RST) below NST | UL | ≥ 35 °C |
| (defined RST is possible at the customer's request) | VDE | ≥ 35 °C |
| Installation height | | from 4,9 mm |
| Diameter | | 9,4 mm |
| Length of the insulation cap | | 15,0 mm |
| Resistance to impregnation * | | suitable |
| Suitable for installation in protection class | | I + II |
| Standard connection | | Lead wire 0,25 mm² / AWG22 |
| Available approvals (please state) | | IEC; VDE; UL; CSA; CQC |
| Operating voltage range AC | | from 100 V to 250 V AC |
| Rated voltage AC | | 250 V (VDE) 277 V (UL) |
| Rated current AC cos φ = 1.0/cycles | | 2,5 A / 1.000 |
| Rated current AC cos φ = 0.6/cycles | | 1,6 A / 1.000 |
| Max. switching current AC cos φ = 1.0/cycles | | 10,0 A / 1.000 |
| Max. switching current AC cos φ = 0.6/cycles | | 6,3 A / 1.000 |
| High voltage resistance | | 2,0 kV |
| Total bounce time | | < 1 ms |
| Contact resistance (according to MIL-STD. R5757) | | ≤ 50 mΩ |
| Vibration resistance at 10 ... 60 Hz | | 100 m/s² |

**Ordering example:**

SP1 - 125. 05 0100 / 0100

- Type / version
- NST [ °C ]
- Tolerance [ K ]
- Lead lengths [ mm ] — $L_1$ $L_2$

**Marking example:**

- Trade mark — **thermik**
- Type / version — **SP1**
- NST [ °C ] . Tolerance [ K ] — **125.05**

*In accordance with the thermik test • Specifications relating to part applications (on the part of the buyer), which deviate from our standards are not checked for their capacity to support an application and/or conformity with standards. The responsibility for testing the suitability of thermik products for such applications falls upon the user. • Slight deviations are possible in terms of dimensions/values, depending on the embodiment of the product. • We reserve the right to make technical changes in the course of further development. • Details concerning certain data, measurement methods, applications, approvals, etc. can be supplied upon request.*

### More varieties of the type series P1:

| | |
|---|---|
| • *P1 – voltage applied; without insulation; for clip contact; minimum batch size* | *www.thermik.de/data/P1* |
| • *CP1 Pin – voltage applied; with connection pins; without insulation* | *www.thermik.de/data/CP1-Pin* |
| • *CP1 – voltage applied; with connector cables; without insulation* | *www.thermik.de/data/CP1* |
| • *SP1 600 – voltage applied; with connector cables; insulation: Mylar®-Nomex®* | *www.thermik.de/data/SP1-600* |
| • *KP1 – with connector cables; insulation: Mylar®-Nomex®* | *www.thermik.de/data/KP1* |
| • *CPK – with connector cables; with a K1 model; without insulation* | *www.thermik.de/data/CPK* |
| • *SPK – with connector cables; with a K1 model; insulation: Mylar®-Nomex®* | *www.thermik.de/data/SPK* |

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brings temperatures under control