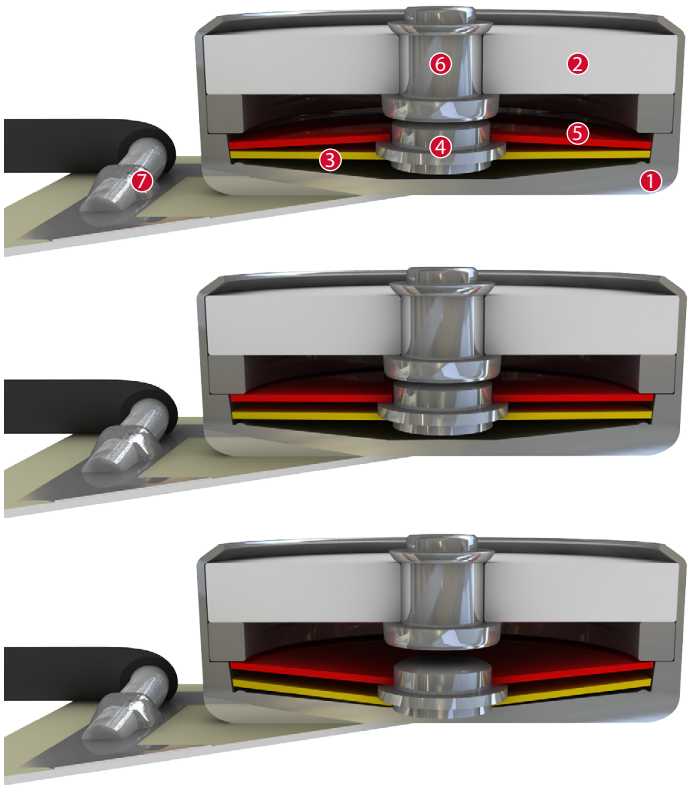
Rev. 1.0 10/2014

DATASHEET

Thermal Protector CW1

Type series W1



Construction and function

The switchgear of type series W1 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 from this stuck out movable contact (4) without having to be welded or fixed. As such, it can continually work (exposed). 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. As a result of the aluminium oxide-based semiconductor connected in series (7) with a defined series resistance, the switchgear his heated externally depending on the operating current and shutdown. In addition, the PTC resistance (T_{REF}= 80°C or 150 °C) switched 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 switchgear cannot reset back. 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. As a result of this design, it is no longer necessary to connect the Thermal protectors to the potential heat source of the device to be protected. Such Thermal protectors are often applied equally effectively at other places in the device to be protected.

Features:

Specially flat design	to fit closely built-up circuits
Quick response sensitivity	Featured by small protector mass and the metal-housing
Excellent long term performance	due to instantaneous switching, fine silver contacts, constant contact resistance and to electrically as well as mechanically unstressed bimetallic disc, reproducible switching temperature values
Instantaneous switching	with always constant contact pressure up to the nominal switching point, resulting in low contact stress
Very short bounce times	< 1 ms
Temperature resistance	by use of high temperature resistant materials and components

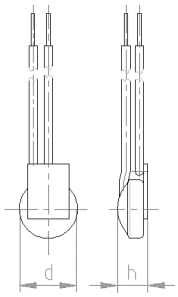
Technical Data Type CW1

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

CW1

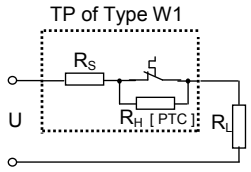
1:1

Type: Normally closed; does not reset automatically; voltage applied; defined as current sensitive; with connector cables; without insulation



Diameter d	9,0 mm
Installation height h	from 5,1 mm

Nominal switching temperature (NST) in 5 °C increments		60 °C - 160 °C
Tolerance (standard)		±5K
Reverse switch temperature (RST) below NST (defined RST is possible at the customer's request)	UL VDE	≥ 35 °C ≥ 35 °C
Installation height		from 5,1 mm
Diameter		9,0 mm
Resistance to impregnation *		suitable
Series resistor for setting the current sensitivity		from 0,12 Ω to 70,0 Ω
Suitable for installation in protection class		I
Standard connection		wire with d = 0,5 mm / AWG22
Available approvals (please state)		IEC; ENEC; VDE; UL
Operating voltage range AC		from 100 V to 250 V
Rated voltage AC		250V (VDE) 277V (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		9,0 A / 1.000
Total bounce time		< 1 ms
Contact resistance (according to MIL-STD. R5757)		≤ 50 mΩ
Self locking with Heating resistor RH (TREF= 80°C or 150 °C)		From -20 °C, suspended in air. With thermal coupling, corresponding higher temperature values. PTC-heating resistor
Vibration resistance at 10 ... 60 Hz		100 m/s²



switching current

from ....A	0.47	0.50	0.65	0.63	0.75	0.90	1.00	1.10	1.30	1.60	1.70	1.83	2.00	2.13	2.80	3.30	3.80	4.50	5.3	6.5
to ....A	0.60	0.70	0.85	0.90	1.00	1.20	1.40	1.60	1.80	2.20	2.40	2.60	2.90	3.00	3.60	4.00	5.30	6.30	7.4	9.0
R_S [in Ω]	27	21	14	12.6	10.5	7.6	5.1	4.2	3.1	2.05	1.75	1.5	1.25	1.1	0.75	0.55	0.36	0.25	0.18	0.12
Series resistors R_S	other nominal resistance values upon request																			

Ordering example:

CW1 - 125. 05 0100 / 0100. 1,1

- Type / version
- NST [°C]
- Tolerance [K]
- Lead lengths [mm] — L_1 / L_2
- Series resistor RS [Ω]

Marking example:

- Trade mark — **thermik**
- Type / version — **CW1**
- NST [°C] . Tolerance [K] — **125.05**
- Series resistor RS [Ω] — **1,1**

More varieties of the type series W1:

- *SW1 – defined as current sensitive; with connector cables; insulation: Mylar®-Nomex®* — *www.thermik.de/data/SW1*
- *CWK – defined as current sensitive; with connector cables; without insulation* — *www.thermik.de/data/CWK*
- *VW1 – with connector cables; fully cast in a Mylar®-Nomex® insulation cap* — *www.thermik.de/data/VW1*
- *VWK – with connector cables; fully cast in a Mylar®-Nomex® insulation cap* — *www.thermik.de/data/VWK*

*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.