



Thermal protectors PTC-Thermistors



Marcel Peter Hofsaess

Managing Director at Thermik 1992 – 2001

Foundation of Mamitec GmbH 2002 Merger with Thermik in 2006

Founder and Managing Director Ellipson Group 2003 – 2006 Merger with Thermik in 2011

Foundation of Hofsaess Holding in 2006 Thermik acquisition

Proprietor and sole Managing Director Thermik Group Since 2006

Over 700 patents



Dear Customers, Dear Readers,

Giving you a grasp of Thermik's technology is one of the chief intentions of this edition. For the first time a manufacturer of temperature control units is allowing a glimpse into the innermost of its products: in detail, and yet in such simple language that engineers and businessmen alike are able to understand just what goes on exactly inside a switchgear. Why are we doing this? Well, firstly it is time that the qualitative differences became more transparent with the function also for users and secondly, so that you no longer have to decide between black box systems. In this new edition, Thermik entirely lives up to its progressive role as a market leader.

But even merely with regard to products you will find innovations which are currently unmatched by any competition. In addition to the two new products **SSM** and **TPR** from the PTC thermistor area, the **SMD** variation will also be presented as a new version of the existing 01 series. The latter will make it possible to assemble printed circuit boards fully automatically and without a plug connection. This is a revolution for printed circuit board assembly. And this is rounded off by a standard program that includes the widest product range of temperature control units worldwide. You can almost always find the right solution in a product range consisting of more than 20,000 articles ...

An experienced IP management and a young, forward-looking organization have created generally unsurpassed synergies to date: since inauguration of the new headquarters in 2011 we have been able to register three times as many national and international patents than in the 10 years before that! And this despite the fact that we were already leaders in this sector before. Our new, independently developed material planning system has established itself very well since 2011. A method immune from market fluctuations guaranteeing significantly shorter processes and hence more stable delivery periods in the history of the company.

Our share of customized solutions is constantly developing further too. Many renowned market leaders gain their individual market advantage over traditional products through special applications. What we have to offer our customers and partners today is confirmed by the three most important awards we received consecutively in 2019/2020:

1) For the 10th time in a row, we received the **top 100 innovation prize** of the German medium-sized business sector, which is only conferred on the 100 most innovative companies in Germany.

2) A repeated listing in the **Encyclopedia of Global Market Leaders**. The prerequisite for being listed is an exclusive, uncontested market leading top position within the sector nationally and internationally. Some of our top customers can also be found here.

3) The **CrefoZert** of the German Creditreform, the biggest German credit rating agency, is a solvency ranking among all German companies. Those who receive it are among the 1.7 per cent of companies with the greatest economic stability, lowest default risk and best credit rating in Germany. It was awarded to Thermik for the seventh time in a row. Achieving this was not just down to us, but thanks to our customers' expectations of top quality, combined with the best possible value for money. Their lasting confidence gave and continues to give us the opportunity to match growing demands with our expertise and in addition develop expectations of our own capacities that transcend the current state-of-the-art. Allowing the best to arise out of the good. Just like what we always demand of ourselves.

4) According to the rating agency Plimsoll, our company is not only the most successful and consistent in the sector, but is in addition among the **avantgarde of the most successful SMEs in Europe.**

Our unceasing efforts in every area, but especially in research and development, ensure that we will also be at the innovative forefront in the future and continue to be able to guarantee maximum price stability and the lowest return rate of all providers. To ensure you remain in good hands with us.

Yours sincerely, M. P. Hofsaess

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History & tradition

Innovation means leading. It takes courage – the first to invest in better ideas, better solutions, better products. This makes progress possible, and Thermik leadership has defined an industry.

Thermik Gerätebau GmbH was founded in 1968 by Peter Hofsaess, in Pforzheim, Germany. An inventor (192 patents), Hofsaess was the first to solve the problem of electrical current self-heating in bimetallic switches. From that point forward his goal was to create and build the best and most reliable thermal protectors in the world.

Since 1992, the Hofsaess family successor has systematically developed this vision and established Thermik as a world leader in its industry. Through a focus on innovation, Thermik has become the most technologically advanced and financially stable manufacturer of thermal protection products and science. Already more than 3,5 billion Thermik protectors are in use worldwide today.

Continuously achieving that goal, Thermik has become an internationally operating group of companies with more than 600 employees and four production sites on three continents.



Company founder Peter Hofsaess 1941 – 199

Thermik production facilities total more than 183,000 sqft. Today, all production plants are equipped with equivalent production lines. This means the Thermik product produced at each production site is consistent. Each site can deliver each and every Thermik product. This represents optimum assurance for quality and logistics!

In addition to the largest and most advanced product range on the market, Thermik today holds more patents and intellectual property rights in the field of thermal protectors than all its competitors combined ! Thermik attaches enormous importance to research and development. Patent Development is a core competence for Thermik, with more than 15% of revenue re-invested. Several new national and international product developments every year continue the historic stream of inventions.

Thermik has year-over-year won numerous awards for innovation, and is currently one of Germany's 100 most innovative SMEs (manufacturers), and one of the 75 most efficient SMEs, as named by Germany's largest and most influential auditing companies* **

With good reason, many market leading manufacturers rely on Thermik exclusively for thermal protection in their products. Their designs specify Thermik, with confidence. Delivering consistently excellent product, to exacting specifications, and meeting customer's needs with the same dependability as our products, has made Thermik what it is today – the recognized market leader in innovation and quality in thermal protectors worldwide!

* Ernst & Young: Entrepreneur of the Year (see reference on p.52 ** TOP 100 (see reference on p.52)





History & tradition

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Thermik in Sondershausen, headquarters of the group since 2011

For us, this means constantly setting and achieving new goals, with our customer/partners, in a combined vision of success for the future. We know for each new day, an old idea is improved and a new one is created: Progress never rests. For Thermik, this is demonstrated by leading the way.

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Products & technology

Conventional systems in thermal protectors

Traditional, simple "bimetallic" thermal protectors have engineering functionality and reliability limitations, and can increase risks for customers wanting safety assurance in their applications/ products. The "bimetallic" commonly has a reed-switch design (Fig. 1), with a one-sided free-moving blade and welded-on switch contact. With this free movement, the contact pressure in the closed position changes, continuously varying, dependent upon the temperature. Under certain circumstances, the closed-position contact pressure may decrease critically before the open-position temperature is reached, and an arc may form (Fig. 3) due to critically high contact resistance. Switch functionality is compromised. A "bimetallic's" contacts may even weld together such that the thermal protector no longer opens, and the protective function is lost, permanently and unnoticed. This risk may go undetected, until it is too late. In this way, simple bimetallic switching systems are statistically less reliable than thermal protectors with non-current-carrying bimetallic discs.

For all "bimetallics" the reed-switch design can have high sensitivity to vibration in the vicinity of nominal switching temperatures, due to the variable contact pressure and the inevitable minimum contact pressure at the time of switching. This continuous and incremental contact pressure is compared in a force-displacement curve (Fig. 4), which also shows the movement of a snap-action spring disc thermal protector's switch action. Due to a "bimetallic's" unfavorable contact resistance conditions, increased self-heating near the rated switching temperature can actually change the protector's switch response, with the resulting switching temperature deviating from the expected environment-rated temperature, in a relatively undefined manner. The "bimetallic" can go to open-position at lower actual environment temperature, causing early and increased shutdowns. Additionally, simple "bimetallics" have high contact-wear and higher levels of contact erosion, due to arcing and near-arcing, and increased/ premature switching.

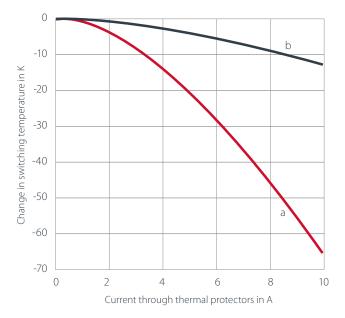


Fig. 2: Self-heating through current: typical behaviour of a current-intensive thermal protector with current-carrying bimetallic disc (a) compared to thermal protectors with no current-carrying bimetallic disc (b)



Fig. 3: Thermal protector without additional spring disc. Insidious contact and arc hazard ensue.

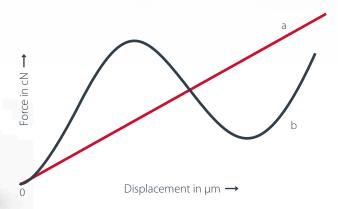


Fig. 4: Load-displacement diagram (characteristic curve): a simple spring disc (linear curve) b spring snap disc (non-linear curve)

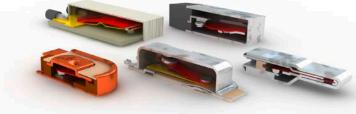


Fig. 1: System examples automatically-resettable and current-sensitive opening thermal protectors: simple reed switch without additional spring disc



Products & technology

The Thermik system

The functionality and reliability of "bimetallic" thermal protectors can be significantly improved by the insertion of an additional spring disc (snap-action). Thermik's twin-disc design permits temperature "calibration" to be built-in to the switch. In Thermik's design, the bimetal disc is free floating in the switch, with contact pressure non-varying. Fig. 2 shows function and switching characteristics of Thermik's patented spring disc thermal protector. Fig. a) at room temperature, the spring disc (yellow) is pressing the contact with continuous force/pressure. Fig. b) before reaching the exact switching temperature, the spring disc continues to press with the same force/pressure. Fig. c) when the bimetal disc (red) opens the contact at the rated temperature, the spring disc "snaps", too, and is held down by the bimetal, pressing against it with minimal force/pressure. As temperature varies – approaching and receding from the switch temperature – the force/pressure on the contact is constant. Thermik's spring disc design has a defined non-linear force curve (Fig.4, page 6). (In Thermik's design, the bimetallic disc's force upon snapping is greater than the opposing force of the spring disc.) Because Thermik's bimetal snap-action disc is, by design, neither electrically nor mechanically stressed, the trip temperature does not drift during the switch life. Bimetallic spring discs (Fig. 3 – different Thermik product lines) are subject to less mechanical stress than non-continuously operating reed-switch discs. With less stress and higher current-carrying capacity, there is lower contact erosion and thus a higher service life.

Additionally, the increased mechanical strength and pressure stability of Thermik's switch enclosures extend the applications of our patented designs. These switch enclosure designs also have superior seal against leakage of varnishes, and are suitable for vacuum impregnation and oil-immersed applications. Thermik's switching system, with its low mass moveable contact, also minimizes contact bounce and provides shock and vibration resistance to 10g's.

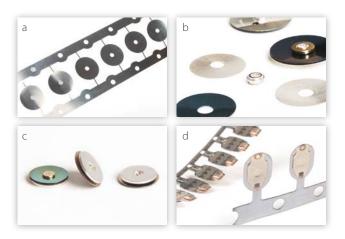


Fig. 1: Non-welded (i.e. undamaged) centric hole discs (a) operate continuously due to an additional mechanism (b, c). If welded bimetallic discs (d) become welded, however, they work intermittently.

Source: Bibliothek der Technik - Temperaturbegrenzer (Bd. 336). Munich: Süddeutscher Verlag onpact GmbH.

Improved switching performance and longer service life



Fig. 2: Function and switching behaviour of a thermal protector with an additional spring disc (yellow) whereby the bimetallic disc (red) can operate continuously.

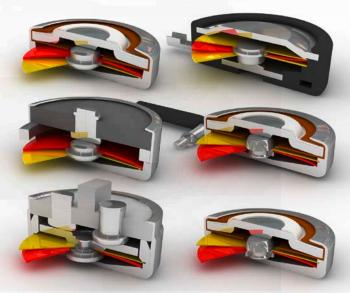


Fig. 3: Auto-resetting and temperature-sensitive opening thermal protectors with additional spring snap disc (non-linear curve)

Systems with continuously operating bimetallic discs have the following characteristic advantages:

- High elastic force with a small spring deflection
- Increased work capacity
- Greater contact stability/greater contact pressure
- Better use of space thanks to circular design (miniaturization)
- Simple geometry: more mechanical strength
- Cost-effective production (uncomplicated tools)
- Longer service life
- Better long-term stability
- Reduced contact resistances
- More precise switching-point accuracy
- No premature switching
- Punctual switching-point response only at ambient temperature

Thermal protectors 1.6 A - 7.5 A

Thermal Protectors

For the following Thermik thermal protector Product Series, frequent customer-requested variations are shown to the right:

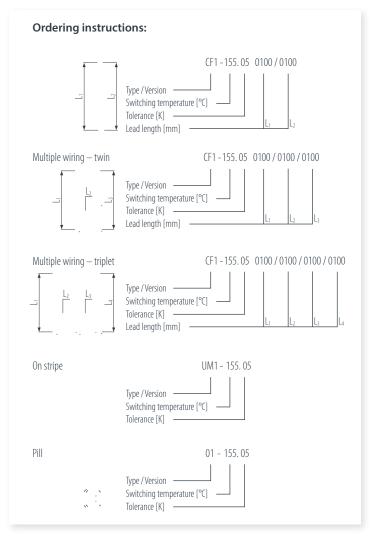
F1	F2	01	02	K1	Z1	P1	W1

Thermik creates endless customized modifications within this Product Series, including customer-application solutions. Thermik's patented engineering in our standard configurations of this Product Series extends to all our custom solutions.

Our rigorous quality processes ensure precision-engineering consistency - in design and manufacture - plant-to-plant, worldwide - and on each order, for both standard and custom specifications.

By design, Thermik's selection of materials, and their composition, requires only the highest-quality materials enter Thermik's supply chain and are used in Thermik products. We source for quality and reliability, over price. From experience, the quality of our precision engineering products depends on it!

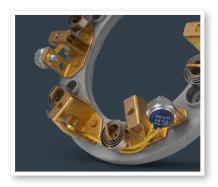
Due to their superior electromechanical properties, the use of precious metals is necessary for Thermik products. Thermik's Engineering Center of Excellence sources locally, within Europe, to assure our quality standards, and further assure our compliance with the international "Conflict-Free Minerals Directive" for special metals! Thermik's eco-friendly products also comply fully with EU Directives on RoHS and REACH.



Examples of typical applications









Thermik products are in accordance CE with the applicable EU directives/ specifications, as amended.



EN 60730









EN 60730



VDE in accordance with dance with GB 14536

COC in accor- UL in accor-2111/UL 873 UL 60730

CSA in accor- CB report in accor dance with UL dance with dance with IEC 0730

ENEC in accordance with CMJ in accordance with IFT

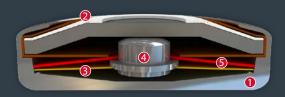


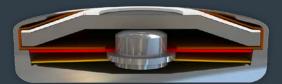
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

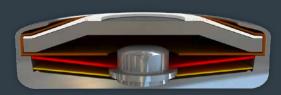
1.6 A - 7.5 A Thermal protectors

Type series F1









Construction and function

The switch mechanism of Type F1 is comprised of five primary parts: 1) a conductive housing, 2) a steel contact cover with stationary contact, 3) a snap-action spring disc, 4) a movable contact, and 5) a bimetallic disc. The self-aligning switch mechanism in place. The cover is insulated from the housing, and closes it to appear like a button cell. The snap-action spring disc is the current transfer element and bears the movable contact. It conducts the current flow and self-heating from the bimetallic disc by exercising consistent, steady contact pressure. The bimetallic disc floats within the thermal protector and the movable contact extends through the center of the bimetallic disc without being welded or riveted. When the rated switching temperature is reached, the bimetallic disc snaps into its inverted position and pushes the spring disc downwards. The contact is abruptly opened and the temperature rise of the device being protected is disrupted. If the ambient temperature then falls, the bimetallic disc snaps back into its original position, and the contact is once again closed. The thermal protector may be covered with insulation, mounted into another housing, or left uninsulated. See specifications and ranges described below.



Type: Normally closed; resets automatically; with connector cables; with or without epoxy; without insulation

Nominal switching temperature (NST) ir	1.5 ℃ 70 ℃ – 180 ℃
increments	
Tolerance (standard)	±2.5 K / ±5 K
Reverse Switch Temperature UL	\geq 35 °C (\leq 80 °C NST)
(defined RST is possible at	$-35 \text{ K} \pm 15 \text{ K} (\ge 85 \text{ °C} \le 180 \text{ °C} \text{ NST})$
the customer's request) VDE	≥ 35 °C
Installation height	from 3.4 mm
Diameter	9.0 mm
Resistance to impregnation *	suitable
Suitable for installation in protection cl	ass
Pressure resistance to the switch housing	
Standard connection	Lead wire 0.25 mm ² / AWG22
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC

Operational voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Vibration resistance at 10 60 Hz	100 m / s ²



Type: Normally closed; resets auto	matically; with connector	cables; with or without epoxy; insulati	on: Mylar®-Nomex®
Nominal switching temperature (NST) in 5 °C	70 °C − 180 °C	Operational voltage range AC	up until 500.0 V AC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at -35 K :	± 15 K (≥ 85 °C ≤ 180 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
the customer's request) VDE	≥ 35 °C	High voltage resistance	2.0 kV
Installation height	from 3.8 mm	Total bounce time	< 1 ms
Diameter	9.5 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Length of the insulation cap	14.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *	suitable		
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	150 N		
Standard connection	Lead wire 0.25 mm ² / AWG22		
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC		

Thermal protectors 1.6 A - 7.5 A



Type: Normally closed; resets	automatically; with crimped/so	ldered connections (incl. customer specific co	nnections); without insulc
Nominal switching temperature (NS	T) in 5 ℃ 70 ℃ — 180	°C Operational voltage range AC	up until 500.0 V AC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K / ±5	K Rated current AC cos $\phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	. ≥ 35 °C (≤ 80 °C NS	T) Rated current AC cos $\phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at	-35 K ± 15 K (≥ 85 °C ≤ 180 °C NS	T) Max. switching current AC $\cos \Phi = 1.0$ / cycles	6.3 A / 3,000
the customer's request) VDE	≥ 35	°C Total bounce time	< 1 m
Installation height	from 3.3 m	m Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
Diameter	10.2 m	m Vibration resistance at 10 60 Hz	100 m / s
Housing length	11.5 m	m	
Resistance to impregnation *	suitab	le	
Suitable for installation in protection	on class		
Pressure resistance to the switch ho	ousing * 150	N	
Standard connection	Crin	1p	
Available approvals (please state)	IEC; ENEC; VDE; UL; CO	QC	

Type: Normally closed; resets automatically; with plug connections (incl. customer specific connections); without insulation



Nominal switching temperature (NST) in 5 °C			70 ℃ — 180 ℃
increments			
Tolerance (standard)			±2.5 K / ±5 K
Reverse Switch Temperature	UL		≥ 35 °C (≤ 80 °C NST)
(defined RST is possible at		-35 K ± 1	5 K (≥ 85 °C ≤ 180 °C NST)
the customer's request)	VDE		≥ 35 °C
Installation height			from 3.3 mm
Diameter			10.2 mm
Housing length			11.5 mm
Resistance to impregnation	*		suitable
Suitable for installation in p	rotection	class	
Pressure resistance to the sw	/itch hou	ising *	150 N
Standard connection			Connection pins
Available approvals (please	state)		IEC; ENEC; VDE; UL; CQC

Operational voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



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pc. Honnan	<i>y ciosca, ic</i>		reany, mai	connector	-0010-

Nominal switching temperatur	in 5 ℃ 70 ℃ – 180 ℃			
increments				
Tolerance (standard)		±2.5 K/±5 K		
Reverse Switch Temperature	UL	\geq 35 °C (\leq 80 °C NST)		
(defined RST is possible at		-35 K \pm 15 K (\geq 85 °C \leq 180 °C NST)		
the customer's request)	VDE	≥ 35 °C		
Installation height		from 3.3 mm		
Diameter		10.2 mm		
Housing length		11.5 mm		
Resistance to impregnation *		suitable		
Suitable for installation in protection class				
Pressure resistance to the swit	sing * 150 N			
Standard connection		Lead wire 0.25 mm ² / AWG22		
Available approvals (please st	IEC; ENEC; VDE; UL; CQC			

Operational voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



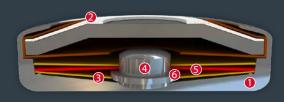
Type: Normally closed; resets automatically; with connector cables; insulation: Mylar®-Nomex®					
Nominal switching temperature (NST) in 5 °C increments	70 ℃ — 180 ℃	Operational voltage range AC Rated voltage AC	up until 500.0 V AC 250.0 V (VDE) 277.0 V (UL)		
Tolerance (standard)	±2.5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000		
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000		
(defined RST is possible at -35 K \pm 15 K (≥ 85 °C ≤ 180 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000		
the customer's request) VDE	≥ 35 °C	High voltage resistance	2.0 kV		
Installation height	from 4.0 mm	Total bounce time	< 1 ms		
Diameter	10.6 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω		
Length of the insulation cap	21.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²		
Resistance to impregnation *	suitable				
Suitable for installation in protection class	+				
Pressure resistance to the switch housing *	150 N				
Standard connection Lead v	/ire 0.25 mm ² / AWG22				
Available approvals (please state)	IEC; ENEC; VDE; UL				

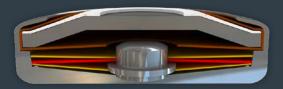
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

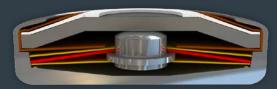
1.6 A - 7.5 A Thermal protectors

Type series F2









Construction and function

The switchgear of type series F2 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a contact cap which is made of steel (2) and insulated from it, and which closes the housing like a button cell. By means of a throw force a bimetallic disc (5) pushes the movable contact (4) that sticks out in the middle of it onto its circumferential collar (6) against the spring snap-in disc (3) that is also surrounding the contact (4). Due to the higher throw force of the bimetallic disc (5) the switch contact remains open against the mechanical resistance of the spring snap-in disc (3) before reaching the rated switching temperature. As such, the contact also remains open as long as the bimetallic disc - only reacting to the ambient temperature - continually works and its shape changes. The bimetallic disc (5) only snaps into its inverted position when the rated switching temperature is reached and the contact is closed by the abruptly released pressure of the spring snap-in disc (3). The spring snap-in disc (3) is now a transfer element for electric current and as such, it enables the bimetallic disc (5) to continue to work on a continuous basis. When the reset temperature is reached, the bimetallic disc snaps back into its start position and the contact is opened again.



Type: Normally open; resets automatically; with connector cables; with or without epoxy; without insulation

Nominal switching temperature (NST)) in 5 ℃ 70 ℃ − 180 ℃
increments	
Tolerance (standard)	±2.5 K/±5 K
Reverse Switch Temperature UL	\geq 35 °C (\leq 80 °C NST)
(defined RST is possible at	-35 K \pm 15 K (\geq 85 °C \leq 180 °C NST)
the customer's request) VDE	≥ 35 °C
Installation height	from 3.4 mm
Diameter	9.0 mm
Resistance to impregnation *	suitable
Suitable for installation in protection	class I
Pressure resistance to the switch hou	sing * 150 N
Standard connection	Lead wire 0.25 mm ² / AWG22
Available approvals (please state)	IEC; ENEC; VDE

· · · ·	
Operating voltage range AC	up until 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10.000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10.000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Vibration resistance at 10 60 Hz	100 m / s ²



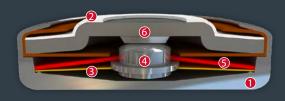
Type: Normally open; resets a	utomatically; with connector	cables; with or without epoxy; insulatic	n: Mylar®-Nomex®
Nominal switching temperature (NST) in	5 ℃ 70 ℃ – 180 ℃	Operating voltage range AC	up until 250.0
increments		Rated voltage AC	250.0 V (VDE) 277.0 V
Tolerance (standard)	±2.5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1
(defined RST is possible at	-35 K ± 15 K (≥ 85 °C ≤ 180 °C NST)	High voltage resistance	2
the customer's request) VDE	≥ 35 °C	Total bounce time	<
Installation height	from 3.8 mm	Contact resistance (according to MIL-STD. R5757)	≤ 5
Diameter	9.5 mm	Vibration resistance at 10 60 Hz	100
Length of the insulation cap	14.0 mm		
Resistance to impregnation *	suitable		
Suitable for installation in protection cla	ass +		
Pressure resistance to the switch housing	ng * 150 N		
Standard connection	Lead wire 0.25 mm ² / AWG22		
Available approvals (please state)	IEC; ENEC; VDE		

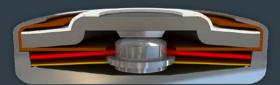
Operating voltage range AC	up until 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

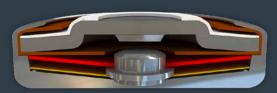
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

Type series 01









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Construction and function

The switchgear of type series 01 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a contact cap which is made of steel (2) and insulated from it, plus an integrated stationary silver contact (6) which closes the housing like a button cell. 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) by exercising consistent, steady contact pressure. The bimetallic disc (5) is held on the one movable contact (4) which sticks out through this without having to be welded or fixed. As such, it can continually work (exposed) and only reacts to the ambient temperature in the device to be protected. 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. If the ambient temperature now falls, the bimetallic disc (5) snaps back into its start position when reaching the defined reset temperature and the contact is closed again.



Type: Normally closed; resets automatically; without cables; without insulation; for clip contact; minimum batch sizes

Nominal switching temperature (NST)	in 5 °C 60 °C – 200 °C	Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the	$-35~\mathrm{K}\pm15~\mathrm{K}~(\ge85~\mathrm{^{\circ}C}\le180~\mathrm{^{\circ}C}~\mathrm{NST})$	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
customer's request)	$-65 \text{ K} \pm 15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C} \text{ NST})$		7.5 A / 300
VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Installation height	from 2.9 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter	9.0 mm	Rated voltage DC	12.0 V
Resistance to impregnation *	suitable	Max. switching current DC / cycles	40.0 A / 5,000
Suitable for installation in protection of	class I	Total bounce time	< 1 ms
Pressure resistance to the switch hous	ing * 450 N	Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Available approvals (please state)	certified as .01:	Vibration resistance at 10 60 Hz	100 m / s ²
	IEC; ENEC; VDE; UL; CSA; CQC		

$\textcircled{\textbf{0}}$
2.5 mm
01150 os E4843 9.0 mm

Type: Normally closed; resets automatically; without cables; without insulation; minimum batch sizes				
Nominal switching temperature (NST) in 5 °C	70 °C − 150 °C	Operational voltage range AC / DC	up until 250.0 V AC / 14.0 V DC	
increments		Rated voltage AC	250.0 V (VDE)	
Tolerance (standard)	±2.5 K/±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000	
Reverse Switch Temperature VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000	
(defined RST is possible at the		Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000	
customer's request)			7.5 A / 300	
Installation height	from 2.5 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000	
Diameter	9.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000	
Resistance to impregnation *	on request	Rated voltage DC	12.0 V	
Suitable for installation in protection class		Max. switching current DC / cycles	15.0 A / 10,000	
Pressure resistance to the switch housing *	450 N	Total bounce time	< 1 ms	
Available approvals (please state)	IEC; ENEC; VDE	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω	
		Vibration resistance at 10 60 Hz	100 m / s ²	

Image: Comparent of the second sec

1.6 A – 7.5 A Thermal protectors



Type: Normally closed; resets automatic	cally; with connector	cables; with epoxy; fully insulated in	a Nomex® cap
Nominal switching temperature (NST) in 5 °C	60 °C – 200 °C	Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
increments	. 2 5 1/ / . 5 1/	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the -35 K \pm 15 K	(≥ 85 °C ≤ 180 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
customer's request) $-65 \text{ K} \pm 15 \text{ K}$	≥ 185 °C ≤ 200 °C NST)		7.5 A / 300
VDE	≥ 35 ℃	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Installation height	from 5.5 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter	9.4 mm	Rated voltage DC	12.0 V
Resistance to impregnation *	suitable	Max. switching current DC / cycles	40.0 A / 5,000
Suitable for installation in protection class	+	High voltage resistance	2.0 kV
Pressure resistance to the switch housing *	450 N	Total bounce time	< 1 ms
Standard connection Lead	wire 0.25 mm ² / AWG22	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Available approvals (please state)	C; ENEC; VDE; UL; CSA; CQC	Vibration resistance at 10 60 Hz	100 m / s ²

C01 Pin uid-100	1:1
www.thermik.de/en/en/data/C01-Pin	3.2 mm
	₩00 01130 as E8669 9.0 mm

Type: Normally closed; resets automa	tically; with pins; with	epoxy; without insulation	
Nominal switching temperature (NST) in 5 °C increments	60 °C − 200 °C	Operational voltage range AC / DC Rated voltage AC	up until 500.0 V AC / 14.0 V DC 250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K/±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the $$-35\ \text{K} \pm 15$$	K (≥ 85 °C ≤ 180 °C NST)	Max. switching current AC $\cos \Phi = 1.0$ /cycles	6.3 A / 3,000
customer's request) $-65 \text{ K} \pm 15 \text{ k}$	((≥ 185 °C ≤ 200 °C NST)		7.5 A / 300
VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Installation height	from 3.2 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter	9.0 mm	Rated voltage DC	12.0 V
Resistance to impregnation *	suitable	Max. switching current DC / cycles	40.0 A / 5,000
Suitable for installation in protection class	1	Total bounce time	< 1 ms
Pressure resistance to the switch housing *	450 N	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Standard connection	Pins 2.2 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC		



iype: Normally closea; resets automa	lically, with connector	cables, with of without epoxy, witho	
Nominal switching temperature (NST) in 5 °C increments	60 °C − 200 °C	Operational voltage range AC / DC Rated voltage AC	up until 500.0 V AC / 14.0 V DC 250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±2.5 K/±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the -35 K \pm 15	5 K (≥ 85 °C ≤ 180 °C NST)	Max. switching current AC cos $\phi = 1.0$ / cycles	6.3 A / 3,000
customer's request) $-65 \text{ K} \pm 15$	K (≥ 185 °C ≤ 200 °C NST)		7.5 A / 300
VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Installation height	from 3.9 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter	9.0 mm	Rated voltage DC	12.0 V
Resistance to impregnation *	suitable	Max. switching current DC / cycles	40.0 A / 5,000
Suitable for installation in protection class		Total bounce time	< 1 ms
Pressure resistance to the switch housing *	450 N	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Standard connection Le	ad wire 0.25 mm ² / AWG22	Vibration resistance at 10 60 Hz	100 m / s ²
Available approvals (please state) IEC; I	ENEC; VDE; UL; CSA; CQC; CMJ		



Type: Normally closed; r	resets automo	atically; with connector	cables; with or without epoxy; insula	tion: Mylar®-Nomex®
Nominal switching temperature	(NST) in 5 ℃	60 °C − 200 °C	Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
increments			Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)		±2,5 K / ±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the	-35 K ± 1	I5 K (≥ 85 °C ≤ 180 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
customer's request)	-65 K ± 15	5 K (≥ 185 °C ≤ 200 °C NST)		7.5 A / 300
	VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Installation height		from 4.3 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter		9.5 mm	Rated voltage DC	12.0 V
Length of the insulation cap		15.0 mm	Max. switching current DC / cycles	40.0 A / 5,000
Resistance to impregnation *		suitable	High voltage resistance	2.0 kV
Suitable for installation in prote	ection class	+	Total bounce time	< 1 ms
Pressure resistance to the switc	h housing *	450 N	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Standard connection	L	ead wire 0.25 mm ² / AWG22	Vibration resistance at 10 60 Hz	100 m / s ²
Available approvals (please state)	IEC	; ENEC; VDE; UL; CSA; CQC; CMJ		

Thermal protectors 1.6 A - 7.5 A



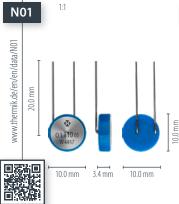
Nominal switching temperature (NST) in 5 °C	205 °C – 250 °C	Operating voltage range AC	up until 500.0 V AC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±10 K	Rated current AC cos $\phi = 1.0$ / cycles	2.5 A / 1,000
Reverse switch temperature (RST) below NST UI	120 °C ±15 K	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
(defined RST is possible at the customer's request) VDI	≥ 35 °C	Total bounce time	< 1 ms
Installation height	from 4.4 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Diameter	9.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *	suitable		
Suitable for installation in protection class			
Pressure resistance to the switch housing *	450 N		
Standard connection Lead w	rire 0.25 mm ² / AWG22		
Available approvals	IEC; ENEC; VDE;		
(please state) UL	(appr. ≤ 230 °C); CQC		



Nominal switching temperature (NST) in 5 °C increments	205 °C — 250 °C	Operational voltage range AC / DC Rated voltage AC	up until 500.0 V AC 250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±10 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Reverse switch temperature (RST) below NST	JL 120 °C ±15 K	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
(defined RST is possible at the customer's request) VI	DE ≥ 35 °C	High voltage resistance	2.0 kV
Installation height	from 5.1 mm	Total bounce time	< 1 ms
Diameter	9.7 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Length of the insulation cap	20.5 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *	suitable		
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	450N		
Standard connection Lead	wire 0.25 mm ² / AWG22		
Available approvals IEC; ENEC; VDE; U	L (appr. ≤ 230 °C); CQC		
(please state)			

1:1 L01 www.thermik.de/en/en/data/L01 10.0 mm 11.0 mm 13.0 mm

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Nominal switching temperature	re (NST) in 5 ℃	60 °C − 200 °C	Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC
increments			Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Tolerance (standard)		±2.5 K / ±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
(defined RST is possible at the	-35 K :	± 15 K (≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
customer's request)	-65 K ±	: 15 K (≥ 185 °C ≤ 200 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
	VDE	≥ 35 °C		7.5 A / 300
Housing height		from 7.0 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Diameter		10.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Thread / Length		M4 x 5.0 mm	Rated voltage DC	12.0 V
Width across flats / Max. torq	ue	10.0 mm / 2 Nm	Max. switching current DC / cycles	40.0 A / 5,000
Resistance to impregnation *		suitable	High voltage resistance	2.0 kV
Suitable for installation in pro	tection class	+	Total bounce time	< 1 ms
Pressure resistance to the swi	tch housing *	450 N	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Standard connection		Lead wire 0.25 mm ² / AWG22	Vibration resistance at 10 60 Hz	100 m / s ²



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	Type: Normally closed; r	esets autor	natically; with a connecti	on wire; partially insulated in a plasti	с сар
	Nominal switching temperature (NST) in 5 °C 60 °C – 200 °C increments		Available approvals (please state) Operational voltage range AC / DC	IEC; ENEC; VDE; UL; CSA; CQC up until 500.0 V AC / 14.0 V DC	
	Tolerance (standard)		±2.5 K / ±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
	Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
	(defined RST is possible at the	-35 K ±	15 K (≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
	customer's request)	-65 K ± 1	15 K (≥ 185 °C ≤ 200 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
		VDE	≥ 35 °C		7.5 A / 300
	Installation height		from 3.4 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
2.0	Diameter		10.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
	Length of the connection pins		14.0 mm / 20.0 mm	Rated voltage DC	12.0 V
	Resistance to impregnation *		suitable	Max. switching current DC / cycles	40.0 A / 5,000
	Suitable for installation in prote	ction class		Total bounce time	< 1 ms
	Pressure resistance to the switch	h housing *	450 N	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
	Standard connection	Conr	necting wire with $d = 0.5 \text{ mm}$	Vibration resistance at 10 60 Hz	100 m / s ²

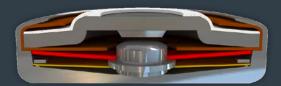
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

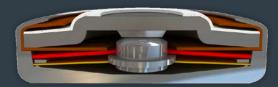
Thermal protectors

Type series 02









Construction and function

The switchgear of type series 02 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a contact cap which is made of steel (2) and insulated from it, plus an integrated stationary silver contact (6) which closes the housing like a button cell. By means of a throw force a bimetallic disc (5) pushes the movable contact (4) that sticks out in the middle of it onto its circumferential collar (6) against the spring snap-in disc (3) that is also surrounding the contact (4). Due to the higher throw force of the bimetallic disc (5) the switch contact remains open against the mechanical resistance of the spring snap-in disc (3) before reaching the rated switching temperature. As such, the contact also remains open as long as the bimetallic disc - only reacting to the ambient temperature - continually works and its shape changes. The bimetallic disc (5) only snaps into its inverted position when the rated switching temperature is reached and the contact is closed by the abruptly released pressure of the spring snapin disc (3). The spring snap-in disc (3) is now a transfer element for electric current and as such, it enables the bimetallic disc (5) to continue to work on a continuous basis. When the reset temperature is reached, the bimetallic



Type: Normally open; re	esets	automatica	lly; with pins; with	h ep	poxy; without insulation	
Nominal switching temperature	e (NST)	in 5 ℃	60 °C – 200 °	С	Operating voltage range AC	up until 500.0 V AC
increments					Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)			±5	K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Reverse Switch Temperature	UL		≥ 35 °C (≤ 80 °C NST	·)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
(defined RST is possible at the		-35 K ± 15 K (≥ 85 °C ≤ 180 °C NST)	Total bounce time	< 1 ms
customer's request)		-65 K ± 15 K (≥	≥ 185 °C ≤ 200 °C NST)	Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
	VDE		≥ 35 °	С	Vibration resistance at 10 60 Hz	100 m / s ⁻
Installation height			from 3.2 mn	n		
Diameter			9.0 mn	n		
Resistance to impregnation *			suitabl	e		
Suitable for installation in prot	ection	class				
Pressure resistance to the swit	ch hou:	sing *	4501	N		
Standard connection			Pins 2.2 mn	n		
Available approvals (please sta	ate)	IEC; E	NEC; VDE; UL; CSA; CQ	C		

Type: Normally open; resets automatically; with connector cables; with or without epoxy; without insulation

CO2 1:1 30mm 90mm 90mm 90mm 90mm

Nominal switching temperature	(NST) in 5 ℃	60 °C − 200 °C	Opera
increments			Rated
Tolerance (standard)		±5 K	Rated
Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated
(defined RST is possible at the	-35 K ± 15 I	$(\geq 85 ^{\circ}\text{C} \leq 180 ^{\circ}\text{C} \text{NST})$	Total b
customer's request)	$-65~{\rm K}\pm15~{\rm K}$	(≥ 185 °C ≤ 200 °C NST)	Contac
	VDE	≥ 35 °C	Vibrat
Installation height		from 3.9 mm	-
Diameter		9.0 mm	
Resistance to impregnation *		suitable	-
Suitable for installation in prote	ction class		
Pressure resistance to the switch	n housing *	450 N	-
Standard connection	Lead	d wire 0.25 mm ² / AWG22	-
Available approvals (please state	e) IEC; ENEC	; VDE; UL; CSA; CQC; CMJ	-

Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

Thermal protectors 1.6 A - 7.5 A

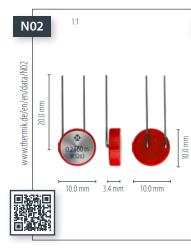


Type: Normally open; resets automatically; with connector cables; with or without epoxy; insulation: Mylar®-Nomex®						
Nominal switching temperature	(NST) in 5 ℃	60 °C – 200 °C	Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC; CMJ		
increments			Operating voltage range AC	up until 500.0 V AC		
Tolerance (standard)		±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)		
Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000		
(defined RST is possible at the	-35 K ± 15	K (≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000		
customer's request)	$-65~{ m K}\pm15~{ m K}$	(≥ 185 °C ≤ 200 °C NST)	High voltage resistance	2.0 kV		
	VDE	≥ 35 °C	Total bounce time	< 1 ms		
Installation height		from 4.7 mm	Contact resistance (according to MIL-STD. R57	$(57) \leq 50 \text{ m}\Omega$		
Diameter		9.5 mm	Vibration resistance at 10 60 Hz	100 m / s ²		
Length of the insulation cap		15.0 mm				
Resistance to impregnation *		suitable				
Suitable for installation in prote	ection class	+				
Pressure resistance to the switc	h housing *	450 N				
Standard connection	Lea	d wire 0.25 mm ² / AWG22				

1:1 L02 www.thermik.de/en/en/data/L02 10.0 mm 11.0 mm 13.0 mm

Type: Normally open; resets automatically; with connector cables; with epoxy; fully insulated in a screw on housing						
Nominal switching temperature (NST) in 5 $^\circ \! C$ increments	60 ℃ – 200 ℃	Standard connection Available approvals (please state)	Lead wire 0.25 mm ² / A IEC; ENEC; VDE; UL; CSA			
Tolerance (standard) Reverse Switch Temperature UL (defined RST is possible at the -35 K ±	$\frac{\pm 5 \text{ K}}{\geq 35 \text{ °C} (\leq 80 \text{ °C NST})}$ $\pm 15 \text{ K} (\geq 85 \text{ °C} \leq 180 \text{ °C NST})$	Operating voltage range AC Rated voltage AC Rated current AC cos $\mathbf{\Phi} = 1.0$ / cycles	up until 500. 250.0 V (VDE) 277.0 2.5 A / 1			
· · · · · · · · · · · · · · · · · · ·	$15 \text{ K} (\ge 85 \text{ °C} \le 100 \text{ °C NST})$ $15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C NST})$ $\ge 35 \text{ °C}$	Rated current AC cos $\Phi = 1.07$ cycles Rated current AC cos $\Phi = 0.67$ cycles High voltage resistance	1.6 A / 1			
Housing height Height	from 7.0 mm 13.0 mm	Total bounce time Contact resistance (according to MIL-STD. R5757)	< 			
Diameter Thread / Length	10.0 mm M4 x 5.0 mm	Vibration resistance at 10 60 Hz	100			
Width across flats / Max. torque Resistance to impregnation * Suitable for installation in protection class	10.0 mm / 2 Nm suitable					
Pressure resistance to the switch housing *	450 N					

Standard connection	Lead wire 0.25 mm ² / AWG22
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC
Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



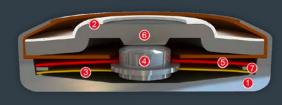
	Type: Normally open; re	esets autom	atically; with a connectic	on wire; partially insulated in a plastic c	ар
	Nominal switching temperature increments	(NST) in 5 °C	60 °C − 200 °C	Operating voltage range AC Rated voltage AC	up until 500.0 V AC 250.0 V (VDE) 277.0 V (UL)
	Tolerance (standard)		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
	Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
	(defined RST is possible at the	-35 K ±	15 K (≥ 85 °C ≤ 180 °C NST)	Total bounce time	< 1 ms
	customer's request)	-65 K ± 1	I5 K (≥ 185 °C ≤ 200 °C NST)	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
		VDE	≥ 35 °C	Vibration resistance at 10 60 Hz	100 m / s ²
	Installation height		from 3.4 mm		
0.0	Diameter		10.0 mm		
	Length of the connection pins		14.0 mm / 20.0 mm		
	Resistance to impregnation *		suitable		
	Suitable for installation in prote	ection class			
	Pressure resistance to the switc	h housing *	450 N		
	Standard connection	Conr	necting wire with $d = 0.5 \text{ mm}$		
	Available approvals (please state	2)	IEC; ENEC; VDE; CSA; CQC		

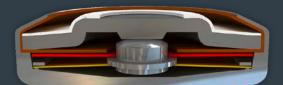
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

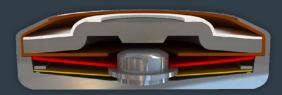
Thermal protectors

Type series K1









Construction and function

The switchgear of type series K1 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a contact cap which is made of steel (2) and insulated from it, plus an integrated stationary silver contact (6) which closes the housing like a button cell. 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) by exercising consistent, steady contact pressure. The bimetallic disc (5) is held on the one movable contact (4) which sticks out through this without having to be welded or fixed. As such, it can continually work (exposed) and only reacts to the ambient temperature in the device to be protected. In addition, between the bimetallic disc (5) and and the spring snap-in disc (3) there is an intermediate ring (7) in order, for the function itself, to stop insignificant vibration noises as a result of the oscillating bimetallic disc (5) on the spring snap-in disc (3) in applications with uncontrolled, magnetic effects. 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. If the ambient temperature now falls, the bimetallic disc (5) snaps back into its start position when reaching the defined reset temperature and the contact is closed again.



Type: Normally closed; resets automatically; with pins; with e	poxy; without insulation	
Nominal switching temperature (NST) in 5 °C 60 °C – 200 °C increments	Operational voltage range AC	up until 500.0 V AC (DC on request)
Tolerance (standard) ± 5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL ≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
(defined RST is possible at the $-35 \text{ K} \pm 15 \text{ K}$ ($\geq 85 \text{ °C} \leq 180 \text{ °C} \text{ NST}$)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
customer's request) $-65 \text{ K} \pm 15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C NST})$	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
VDE ≥ 35 °C		7.5 A / 300
Installation height from 3.2 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Diameter 9.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Resistance to impregnation * suitable	Total bounce time	< 1 ms
Suitable for installation in protection class	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Pressure resistance to the switch housing * 450 N	Vibration resistance at 10 60 Hz	100 m / s ²
Standard connection Pins 2.2 mm		
Available approvals (please state) IEC; ENEC; VDE; UL; CSA; CQC		



Type: Normally closed; res	ets automatically; with connector	r cables; with or without epoxy; withou	t insulation
	CT) + 5.00 - 200.00		
Nominal switching temperature (N	ST) in 5 ℃ 60 ℃ - 200 ℃	Operational voltage range AC	up until 500.0 V AC
increments			(DC on request)
Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature U	L ≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
(defined RST is possible at the	-35 K ± 15 K (≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
customer's request)	-65 K ± 15 K (≥ 185 °C ≤ 200 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
VD	E ≥ 35 °C		7.5 A / 300
Installation height	from 4.0 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Diameter	9.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Resistance to impregnation *	suitable	Total bounce time	< 1 ms
Suitable for installation in protecti	on class I	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Pressure resistance to the switch h	ousing * 450 N	Vibration resistance at 10 60 Hz	100 m / s ²
Standard connection	Lead wire 0.25 mm ² / AWG22		
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC		

Thermal protectors 1.6 A - 7.5 A



Type: Normally closed; resets automatically; with connector	cables; with or without epoxy; insulation: Mylar	°-Nomex®
Nominal switching temperature (NST) in 5 °C 60 °C – 200 °C increments	Operational voltage range AC u	ıp until 500.0 V AC (DC on request)
Tolerance (standard) ±5 K	Rated voltage AC 250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL \geq 35 °C (\leq 80 °C NST)	Rated current AC cos $\phi = 1.0$ / cycles	2.5 A / 10,000
(defined RST is possible at the $-35 \text{ K} \pm 15 \text{ K}$ ($\geq 85 \text{ °C} \leq 180 \text{ °C} \text{ NST}$)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
customer's request) $-65 \text{ K} \pm 15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C NST})$	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
VDE ≥ 35 °C		7.5 A / 300
Installation height from 4.3 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Diameter 9.5 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Length of the insulation cap 15.0 mm	High voltage resistance	2.0 kV
Resistance to impregnation * suitable	Total bounce time	< 1 ms
Suitable for installation in protection class I + II	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Pressure resistance to the switch housing * 450 N	Vibration resistance at 10 60 Hz	100 m / s ²
Standard connection Lead wire 0.25 mm ² / AWG22		
Available approvals (please state) IEC; ENEC; VDE; UL; CSA; CQC		

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Type: Normally closed; resets automa	tically; fully insulated ir	n a screw on housing; with epoxy; with	connector cables
Nominal switching temperature (NST) in 5 $^{\circ}\!\!\!C$ increments	60 °C − 200 °C	Operational voltage range AC / DC	up until 500.0 V AC (DC on request)
Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
(defined RST is possible at the $-35 \text{ K} \pm 13$	5 K (≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,000
	K (≥ 185 °C ≤ 200 °C NST)	Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
VDE	≥ 35 °C		7.5 A / 300
Housing height	from 7.0 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,000
Height	13.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,000
Diameter	10.0 mm	High voltage resistance	2.0 kV
Thread / Length	M4 x 5.0 mm	Total bounce time	< 1 ms
Width across flats / Max. torque	10.0 mm / 2 Nm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Resistance to impregnation *	suitable	Vibration resistance at 10 60 Hz	100 m / s ²
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	450 N		
Standard connection Le	ad wire 0.25 mm ² / AWG22		
Available approvals (please state)	IEC; ENEC; VDE; UL; CQC		

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			10.0 mm

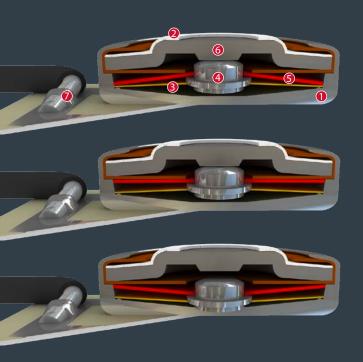
Nominal switching temperature increments	(NST) in 5 °C	60 °C − 200 °C	Operational voltage range AC	up until 500.0 V A (DC on reques
Tolerance (standard)		±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UI
Reverse Switch Temperature	UL	≥ 35 °C (≤ 80 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,00
defined RST is possible at the	-35 K ± 15 K	(≥ 85 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 10,00
ustomer's request)	-65 K ± 15 K (2	≥ 185 °C ≤ 200 °C NST)	Max. switching current AC $\cos \Phi = 1.0$ / cycles	6.3 A / 3,00
	/DE	≥ 35 °C		7.5 A / 30
nstallation height		from 3.4 mm	Rated current AC cos $\Phi = 0.4$ / cycles	1.8 A / 10,00
Diameter		10.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	7.2 A / 1,00
ength of the connection pins		14.0 mm / 20.0 mm	Total bounce time	< 1 n
Resistance to impregnation *		suitable	Contact resistance (according to MIL-STD. R5757)	≤ 50 m
buitable for installation in prote	ction class		Vibration resistance at 10 60 Hz	100 m /
Pressure resistance to the switch	housing *	450 N		
Standard connection	Connecting	g wire with $d = 0.5 \text{ mm}$		
Available approvals (please stat	2)	EC; ENEC; VDE; UL; CQC		

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

1.6 A - 7.5 A Thermal protectors

Type series Z1





Construction and function

The switchgear of type series Z1 is fixed in a positive lock and is self-aligning between the floor of a conductive housing (1) and a contact cap which is made of steel (2) and insulated from it, plus an integrated stationary silver contact (6) which closes the housing like a button cell. 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) by exercising consistent, steady contact pressure. The bimetallic disc (5) is held on the one movable contact (4) which sticks out through this 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. If the ambient temperature now falls, the bimetallic disc (5) snaps back into its start position when reaching the defined reset temperature and the contact is closed again. As a result of the aluminium oxide-based semiconductor connected in series (7) with a defined series resistance, the switchgear is heated externally depending on the operating current and shutdown. 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.

CZ	21	11	11	Туре:
www.thermik.de/en/data/C21		9.0 mm	4.5 mm	9.0 mm

Туре	Normally closed; resets automatically; de	fined as current sensitive	e; with or without epoxy; with connector	cables; without insulatior
Г	Nominal switching temperature (NST) in 5 $^\circ\!\!\!C$ increments	70 °C — 160 °C	Operational voltage range AC	up until 500.0 V AC (DC on request)
	Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
	Reverse switch temperature (RST) below NST	UL ≥ 35 °C	Rated current AC cos $\Phi = 1.0$ / cycles	2.0 A / 3,000
	(defined RST is possible at the customer's request)	VDE ≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 3,000
	Installation height	from 4.5 mm	Max. switching current	4.0 A / 3,000
	Diameter	9.0 mm	AC cos $\Phi = 1.0$ / cycles	
	Resistance to impregnation *	suitable	Total bounce time	< 1 ms
	Series resistor for setting the current	from 0.12 Ω to 70.0 Ω	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
0,55	sensitivity		Vibration resistance at 10 60 Hz	100 m / s ²
	Suitable for installation in protection class			
	Standard connection Le	ad wire 0.25 mm ² / AWG22		
mm	Available approvals IEC; ENEC; VD	E; UL (NST 70 °C – 130 °C)		
	(please state)			

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		1	9.5	mm	5.0 mm

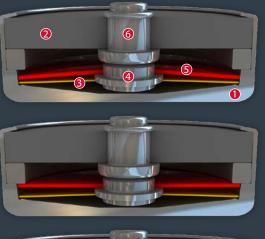
Type: Normally closed; resets automatically; de	efined as c	urrent sensitive; wi	th or without epoxy; with connector cables,	; insulation: Mylar®-Nomex
Nominal switching temperature (NST) in 5 °C increments		70 °C − 160 °C	Operational voltage range AC	up until 500.0 V AC (DC on request)
Tolerance (standard)		±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\Phi = 1.0$ / cycles	2.0 A / 3,000
(defined RST is possible at the customer's request)) VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 3,000
Installation height		from 5.0 mm	Max. switching current	4.0 A / 3,000
Diameter		9.5 mm	AC cos $\Phi = 1.0$ / cycles	
Length of the insulation cap		18.0 mm	High voltage resistance	2.0 kV
Resistance to impregnation *		suitable	Total bounce time	< 1 ms
Series resistor for setting the current	fro	m 0.12 Ω to 70.0 Ω	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
sensitivity			Vibration resistance at 10 60 Hz	100 m / s ²
Suitable for installation in protection class		+		
Standard connection	Lead wire ().25 mm² / AWG22		
Available approvals (please state) IEC; ENEC,	; VDE; UL (N	ST 70 °C — 130 °C)		

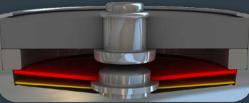
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The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

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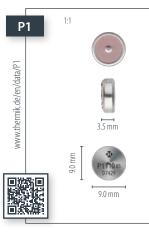
Type series P1





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.



Nominal switching temperature (NST) in 5 °C		60 ℃ – 180 ℃	Operating voltage range AC	from 115.0 V to 250.0 V
increments			Rated voltage AC	250.0 V (VDE) 277.0 V (
Tolerance (standard)		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,
(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1
Installation height		from 3.5 mm	Max. switching current AC $\cos \Phi = 0.6$ / cycles	6.3 A / 1
Diameter		9.0 mm	Total bounce time	<1
Suitable for installation in protection class			Contact resistance (according to MIL-STD. R5757)	≤ 50
Standard connection		Terminal contact	Vibration resistance at 10 60 Hz	100 m
Available approvals	IEC;	VDE; UL; CSA; CQC		
(please state)				



Type: Normally closed; does not reset automatically; voltage applied; with connection pins; without insulation

Nominal switching temperature (NST) in 5 $^\circ\!\!{\rm C}$		60 °C − 180 °C
increments		
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 4.1 mm
Diameter		9.0 mm
Suitable for installation in protection class		
Standard connection		Pins 2.2 mm
Available approvals	IEC;	VDE; UL; CSA; CQC
(please state)		

Operating voltage range AC	from 115.0 V to 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Max. switching current AC $\cos \Phi = 0.6$ / cycles	6.3 A / 1,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

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1.6 A – 7.5 A Thermal protectors



Type: Normally closed; does not reset	automat	ically; voltage ap
Nominal switching temperature (NST) in 5 °C		60 °C − 180 °C
increments		
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 4.5 mm
Diameter		9.0 mm
Resistance to impregnation *		suitable
Suitable for installation in protection class		
Standard connection	Lead wire 0	.25 mm² / AWG22
Available approvals (please state)	IEC; \	/DE; UL; CSA; CQC

Operating voltage range AC	from 115.0 V to 250.0 V A
Rated voltage AC	250.0 V (VDE) 277.0 V (UL
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC $\cos \Phi = 1.0$ / cycles	10.0 A / 1,000
Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
Total bounce time	< 1 m
Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
Vibration resistance at 10 60 Hz	100 m / s



Nominal switching temperature (NST) in 5 °C		60 ℃ – 180 ℃	Operating voltage range AC	from 115.0 V to 250.0 V AC
increments		00 C 100 C	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)		±5 K	Rated current AC cos $\phi = 1.0$ / cycles	2.5 A / 1,000
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\phi = 0.6$ / cycles	1.6 A / 1,000
(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Installation height		from 5.0 mm	Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
Diameter		9.5 mm	High voltage resistance	2.0 kV
Length of the insulation cap		15.0 mm	Total bounce time	< 1 ms
Resistance to impregnation *		suitable	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Suitable for installation in protection class		+	Vibration resistance at 10 60 Hz	100 m / s ²
Standard connection	Lead wire ().25 mm² / AWG22		
Available approvals (please state)	IEC;	VDE; UL; CSA; CQC		



Nominal switching temperature (NST) in 5 $^\circ \!$		60 ℃ – 180 ℃
increments		
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 6.6 mm
Diameter		11.0 mm
Length of the insulation cap		16.5 mm
Resistance to impregnation *		suitable
Suitable for installation in protection class		+
Pressure resistance to the switch housing *		600 N
Standard connection	Lead wire ().25 mm ² / AWG22
Available approvals (please state)	IEC;	VDE; UL; CSA; CQC

Operating voltage range AC	from 115.0 V to 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Max. switching current AC $\cos \Phi = 0.6$ / cycles	6.3 A / 1,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



rype. Normally closed, does not reset	uutomut	ically, voltage ap	plied; with connector cables; insulation: ı	Nyiai Norricx
Nominal switching temperature (NST) in 5 °C		60 ℃ – 180 ℃	Operating voltage range AC	from 115.0 V to 250.0
increments			Rated voltage AC	250.0 V (VDE) 277.0 V
Tolerance (standard)		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1
(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1
Installation height		from 4.9 mm	Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1
Diameter		9.5 mm	High voltage resistance	2
Length of the insulation cap		13.0 mm	Total bounce time	<
Resistance to impregnation *		suitable	Contact resistance (according to MIL-STD. R5757)	≤ 5(
Suitable for installation in protection class		+	Vibration resistance at 10 60 Hz	100 r
Standard connection	Lead wire 0).25 mm² / AWG22		
Available approvals (please state)	IEC;	VDE; UL; CSA; CQC		

Thermal protectors 1.6 A - 7.5 A



Type: Normally closed; does not reset automatically; voltage applied; with connector cables; with a K1 model; without insulation

Nominal switching temperature (NST) in 5 °C		60 °C – 180 °C
increments		
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 4.5 mm
Diameter		9.0 mm
Resistance to impregnation *		suitable
Suitable for installation in protection class		
Standard connection	Lead wire	0.25 mm ² / AWG22
Available approvals (please state)		IEC; VDE; UL; CSA

Operating voltage range AC	from 115.0 V to 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

SPK 1:1 Multiple Multiple 9.5 mm 4.9 mm

 Normally closed; does not reset dutorn	alically;v	onage appliea;	with conne
Nominal switching temperature (NST) in 5 °C increments		60 °C – 180 °C	Operatin Rated vo
Tolerance (standard)		±5 K	Rated cu
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated cu
(defined RST is possible at the customer's request)	VDE	≥ 35 ℃	Max. swi
Installation height		from 4.9 mm	Max. swit
Diameter		9.5 mm	High volt
Length of the insulation cap		15.0 mm	Total bou
Resistance to impregnation *		suitable	Contact re
Suitable for installation in protection class		+	Vibration
Standard connection	Lead wire 0	.25 mm² / AWG22	
Available approvals (please state)		IEC; VDE; UL; CSA	-

Operating voltage range AC	from 115.0 V to 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC $\cos \Phi = 1.0$ / cycles	10.0 A / 1,000
Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

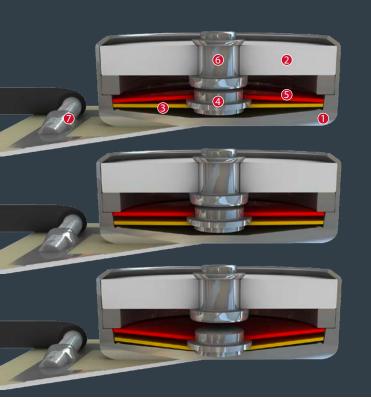
Nominal switching temperature (NST) in 5 °C	60 °C – 180 °C	Operating voltage range AC	from 115.0 V to 250.0 V AC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Reverse switch temperature (RST) below NST UL	≥ 35 ℃	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
(defined RST is possible at the customer's request) VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Installation height	from 6.0 mm	Max. switching current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
Diameter	10.5 mm	High voltage resistance	2.0 kV
Length of the insulation cap	19.0 mm	Total bounce time	< 1 ms
Resistance to impregnation *	suitable	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Suitable for installation in protection class	+	Vibration resistance at 10 60 Hz	100 m / s ²
Standard connection Lead wire	e 0.25 mm ² / AWG22		
Available approvals (please state)	IEC; VDE		

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

Type series W1



1.6 A - 7.5 A Thermal protectors



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 snapin 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 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.



Type: Normally closed; does not reset	automatic	ally; voltage applied
Nominal switching temperature (NST) in 5 %	C	60 °C − 160 °C
increments Tolerance (standard)		±5 K
Reverse switch temperature (RST) below NST	UI	> 35 °C
(defined RST is possible at the customer's reque	est) VDE	≥ 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		
Standard connection	wire with d	l = 0.5 mm / AWG22
Available approvals (please state)		IEC; VDE; UL; CSA

ŶĊ	Operating voltage range AC	from 115.0 V to 250.0 V AC
	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
K YC	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
°C	Max. switching current AC $\cos \Phi = 1.0$ / cycles	9.0 A / 1,000
m	Total bounce time	< 1 ms
m	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
le	Vibration resistance at 10 60 Hz	100 m / s ²
Ω		



Type: Normally closed; does not reset autom	atically; voltage applied; def	îned as current sensitive; with connector cables;	insulation: Mylar®-Nome
Nominal switching temperature (NST) in 5 $^{\circ}\mathrm{C}$ increments	60 °C − 160 °C	Operating voltage range AC Rated voltage AC	from 115.0 V to 250.0 250.0 V (VDE) 277.0 V
Tolerance (standard)	±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1
Reverse switch temperature (RST) below NST	UL ≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1
(defined RST is possible at the customer's request)	VDE ≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	9.0 A / 1
Installation height	from 5.5 mm	High voltage resistance	2
Diameter	10.0 mm	Total bounce time	<
Length of the insulation cap	19.5 mm	Contact resistance (according to MIL-STD. R5757)	≤ 50
Resistance to impregnation *	suitable	Vibration resistance at 10 60 Hz	100 r
Series resistor for setting the current sensitivity	from 0.12 Ω to 70.0 Ω		
Suitable for installation in protection class	+		
Standard connection wir	e with $d = 0.5 \text{ mm} / \text{AWG22}$	-	
Available approvals (please state)	IEC; VDE; UL; CSA		

Operating voltage range AC	from 115.0 V to 250.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	9.0 A / 1,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Vibration resistance at 10 60 Hz	100 m / s ²

Thermal protectors 1.6 A - 7.5 A



Nominal switching temperature (NST) in 5 °C		60 ℃ – 160 ℃	Operating voltage range A
increments			Rated voltage AC
Folerance (standard)		±5 K	Rated current AC cos $\Phi = 1$
leverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC $\cos \Phi = 0$
defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC co
nstallation height		from 5.1 mm	Total bounce time
Diameter		9.0 mm	Contact resistance (according
lesistance to impregnation *		suitable	Vibration resistance at 10
Series resistor for setting the current sensitivity	fro	om 0.12 Ω to 70.0 Ω	
Suitable for installation in protection class			
Standard connection wire	e with d =	= 0.5 mm / AWG22	
Available approvals (please state)		IEC; VDE	

:u; u	enned as current sensitive, with connector	cables, without insulation
	Operating voltage range AC	from 115.0 V to 250.0 V AC
	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
_	Max. switching current AC cos $\Phi = 1.0$ / cycles	9.0 A / 1,000
	Total bounce time	< 1 ms
	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
_	Vibration resistance at 10 60 Hz	100 m / s ²
_		
_		
_		

	1.		Nominal switching temperature (NST) in 5 °C	60 °C	— 160 °C	Operating voltage range AC	from 115.0 V to 250.0 V AC
	n n		increments			Rated voltage AC	250.0 V (VDE)
	× T		Tolerance (standard)		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
	R PRAIR		Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
			(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC cos $\phi = 1.0$ / cycles	9.0 A / 1,00
I T	2	and the second	Installation height	fron	n 5.8 mm	High voltage resistance	2.0 k\
	1.97	538	Diameter		10.4 mm	Total bounce time	< 1 m
ε	- Ch	100	Length of the insulation cap		18.0 mm	Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
8.0 mm	thermik	14.1	Resistance to impregnation *		suitable	Vibration resistance at 10 60 Hz	100 m / s
	VW116005 0.12	1	Series resistor for setting the current sensitivity	from 0.12 Ω	to 70.0 Ω		
			Suitable for installation in protection class		+		
経済し	10.4 mm	5.8 mm	Standard connection wire	with $d = 0.5 \text{ mm}$	/AWG22		
新聞			Available approvals (please state)		IEC; VDE		

			Nominal switching temperature (NST) in 5 °C		60 ℃ – 160 ℃	Operating voltage range AC	from 115.0 V to 250.0 V AC
	1	1	increments			Rated voltage AC	250.0 V (VDE)
	A	4	Tolerance (standard)		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 1,000
		10	Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	1.6 A / 1,000
			(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Max. switching current AC $\cos \Phi = 1.0$ / cycles	9.0 A / 1,000
			Installation height		from 5.8 mm	High voltage resistance	2.0 kV
	1 Silling		Diameter		9.9 mm	Total bounce time	< 1 ms
_	1 Product		Length of the insulation cap		18.0 mm	Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
8.0 m m	thermik		Resistance to impregnation *		suitable	Vibration resistance at 10 60 Hz	100 m / s ²
-	VWK16005 0.25		Series resistor for setting the current sensitivity	from	n 0.12 Ω to 70.0 Ω		
湖田	and the second		Suitable for installation in protection class		+		
N164	10.4 mm	5.8 mm	Standard connection wire	with $d = 0$).5 mm / AWG22		

Thermal Protectors

For the following Thermik thermal protector Product Series, frequent customer-requested variations are shown to the right:

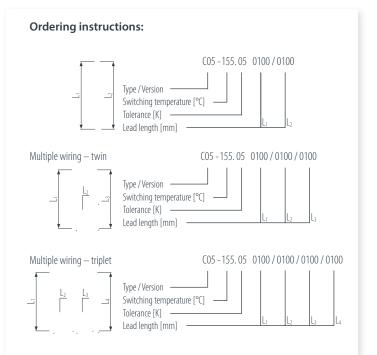
05 09 Q5 06 08 Y6 YH R6	05	09	Q5	06	08	Y6	YH	R6
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Thermik creates endless customized modifications within this Product Series, including customer-application solutions. Thermik's patented engineering in our standard configurations of this Product Series extends to all our custom solutions.

Our rigorous quality processes ensure precision-engineering consistency - in design and manufacture - plant-to-plant, worldwide - and on each order, for both standard and custom specifications.

By design, Thermik's selection of materials, and their composition, requires only the highest-quality materials enter Thermik's supply chain and are used in Thermik products. We source for quality and reliability, over price. From experience, the quality of our precision engineering products depends on it!

Due to their superior electromechanical properties, the use of precious metals is necessary for Thermik products. Thermik's Engineering Center of Excellence sources locally, within Europe, to assure our quality standards, and further assure our compliance with the international "Conflict-Free Minerals Directive" for special metals! Thermik's eco-friendly products also comply fully with EU Directives on RoHS and REACH



Examples of typical applications







dance with

EN 60730



dance with

GB 14536











Thermik products are in accordance CE

EN 60730

ENEC in accordance with

with the applicable EU directives/ specifications, as amended.

2111/11 873 UL 60730

dance with UL

COC in accor- UL in accor-

CSA in accor- CB report in accor dance with

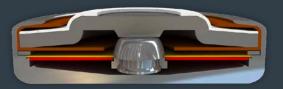
CMJ in accordance with IFT

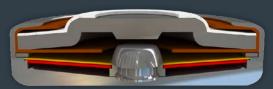
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

Type series 05









Construction and function

Switchgear consisting of a movable silver contact (1), a contact bearer (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a conductive, heat-transferring housing (5) and a contact cap made of steel (6) that is insulated from it, plus a stationary countercontact (7). At the same time, the switchgear is carried by the spring snap-in disc (3) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the movable contact (1), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snap-in disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contact is abruptly opened. The temperature will now fall, the bimetallic disc (4) will only snap back upon reaching a defined reset temperature and the contact is closed again.



Nominal switching temperat	ure (NS	T) in 5 °C increments	50 ℃ – 200 ℃	
Tolerance (standard)			±5 K	
Reverse Switch Temperature	UL	≥ 3	5 °C (≤ 75 °C NST)	
(defined RST is possible at		-30 K ± 15 K (≥ 80	$^{\circ}C \le 200 \ ^{\circ}C \ NST$	
the customer's request)	VDE		≥ 35 °C	
Installation height			from 5.1 mm	
Diameter			11.0 mm	
Resistance to impregnation	*		suitable	
Suitable for installation in protection class				
Pressure resistance to the sy	witch h	ousing *	300 N	
Standard connection		Lead wire	0.5 mm ² / AWG20	
Available approvals (please	state)	IEC; ENEC; VDE; U	L (appr.≤ 180 °C);	
			CSA; CQC; CMJ	

Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 3,000
	20.0 A / 300
Rated current AC cos $\Phi = 0.4$ / cycles	4.6 A / 10,000
Max. switching current AC cos $\Phi = 0.4$ / cycles	18.4 A / 1,000
Rated voltage DC	12.0 V
Max. switching current DC / cycles	40.0 A / 10,000
Max. switching current DC / cycles	60.0 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

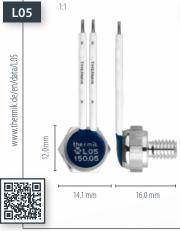


Type: Normally closed; reset	s automatically; with connector	cables; with or without epoxy; insula	tion: Mylar®-Nomex®
Nominal switching temperature (NST)	in 5 °C increments 50 °C – 200 °C	Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL	≥ 35 °C (≤ 75 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
(defined RST is possible at	-30 K \pm 15 K (\geq 80 °C \leq 200 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
the customer's request) VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	10.0 A / 3,000
Installation height	from 5.5 mm		20.0 A / 300
Diameter	11.7 mm	Rated current AC cos $\Phi = 0.4$ / cycles	4.6 A / 10,000
Length of the insulation cap	18.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	18.4 A / 1,000
Resistance to impregnation *	suitable	Rated voltage DC	12.0 V
Suitable for installation in protection	class I + II	Max. switching current DC / cycles	40.0 A / 10,000
Pressure resistance to the switch hou	ising * 300 N	Max. switching current DC / cycles	60.0 A / 3,000
Standard connection	Lead wire 0.5 mm ² / AWG20	High voltage resistance	2.0 kV
Available approvals (please state)	IEC; ENEC; VDE; UL (appr.≤ 180 °C);	Total bounce time	< 1 ms
	CSA; CQC; CMJ	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
		Vibration resistance at 10 60 Hz	100 m / s ²

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The **Cherner**

4.0 A - 25.0 A Thermal protectors



Type: Normally closed; reset	s automatically; with connecto	r cables; with epoxy; fully insulated in	a screw on housing
Nominal switching temperature (NST)	in 5 °C increments 50 °C – 200 °C	Operational voltage range AC / DC	up until 500.0 V AC / 14.0
Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V
Reverse Switch Temperature UL	≥ 35 °C (≤ 75 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 1
(defined RST is possible at	-30 K \pm 15 K (\geq 80 °C \leq 200 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 1
the customer's request) VDE	≥ 35 °C	Max. switching current AC $\cos \Phi = 1.0$ / cycles	10.0 A /
Housing height	from 8.0 mm		20.0 A
Diameter	14.1 mm	Rated current AC cos $\Phi = 0.4$ / cycles	4.6 A / 1
Thread / Length	M6 x 8.0 mm	Max. switching current AC cos $\Phi = 0.4$ / cycles	18.4 A /
Width across flats / Max. torque	13.0 mm / 8 Nm	Rated voltage DC	
Resistance to impregnation *	suitable	Max. switching current DC / cycles	40.0 A / 1
Suitable for installation in protection	class I + II	Max. switching current DC / cycles	60.0 A /
Pressure resistance to the switch hou	ising * 300 N	High voltage resistance	
Standard connection	Lead wire 0.5 mm ² / AWG20	Total bounce time	<
Available approvals (please state)	IEC; ENEC; VDE; UL (appr.≤ 180 °C);	Contact resistance (according to MIL-STD. R5757)	≤ 5
	CSA; CQC	Vibration resistance at 10 60 Hz	100

readies, with epoxy, raily insulated in t	a serew on nousing
Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Max. switching current AC $\cos \phi = 1.0$ / cycles	10.0 A / 3,000
- 	20.0 A / 300
Rated current AC cos $\Phi = 0.4$ / cycles	4.6 A / 10,000
Max. switching current AC cos $\Phi = 0.4$ / cycles	18.4 A / 1,000
Rated voltage DC	12.0 V
Max. switching current DC / cycles	40.0 A / 10,000
Max. switching current DC / cycles	60.0 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

1:1 F05 www.thermik.de/en/data/F05 10.5 mm 6.5 mm 10.5 mm

Type: Normally closed; resets automatically; with connector cables; with epoxy; fully insulated in a Nomex® cap

Nominal switching temperature (NST) i	n 5 ℃ 50 ℃ – 200 ℃
increments	
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 75 °C NST)
(defined RST is possible at	$-30 \text{ K} \pm 15 \text{ K} (\geq 80 \text{ °C} \leq 200 \text{ °C} \text{ NST})$
the customer's request) VDE	≥ 35 °C
Installation height	from 6.5 mm
Diameter	10.5 mm
Resistance to impregnation *	suitable
Suitable for installation in protection of	lass +
Pressure resistance to the switch housi	ing * 300 N
Standard connection	Lead wire 0.5 mm ² / AWG20
Available approvals (please state)	IEC; ENEC; VDE; UL (appr. \leq 180 °C);
	CSA; CQC

Available approvals (please state)

Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Max. switching current AC $\cos \Phi = 1.0$ / cycles	10.0 A / 3,000
	20.0 A / 300
Rated current AC cos $\Phi = 0.4$ / cycles	4.6 A / 10,000
Max. switching current AC $\cos \Phi = 0.4$ / cycles	18.4 A / 1,000
Rated voltage DC	12.0 V
Max. switching current DC / cycles	40.0 A / 10,000
Max. switching current DC / cycles	60.0 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Nominal switching temperature (NST) in 5 °C	205 ℃ – 250 ℃	Operational voltage range AC	up until 500.0 V AC
increments		Rated voltage AC	250.0 V
Tolerance (standard)	±10 K	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Reverse switch temperature (RST) below NST	120 ℃ ±15 K	Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
(defined RST is possible at the customer's request) VDE	≥ 35 °C	Total bounce time	< 1 ms
Installation height	from 6.6 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Diameter	11.4 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Length of the insulation cap	22.5 mm		
Resistance to impregnation *	suitable		
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	300 N		
Standard connection	Lead wire AWG20		

VDE; ENEC



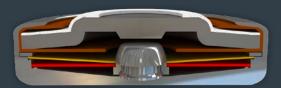
itically	r; with connector	cables; with or without epoxy; without in	sulation
	205 ℃ – 250 ℃	Operational voltage range AC	up until 500.0 V AC
		Rated voltage AC	250.0 V
	±10 K	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
	120 °C ±15 K	Rated current AC cos $\phi = 0.6$ / cycles	4.0 A / 10,000
VDE	≥ 35 °C	Total bounce time	< 1 ms
	from 6.0 mm	Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
	11.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²
	suitable		
	300 N		
	Lead wire AWG20		
	VDE; ENEC		
		205 °C - 250 °C ±10 K 120 °C ±15 K VDE ≥ 35 °C from 6.0 mm 11.0 mm suitable I 300 N Lead wire AWG20	Alted voltage AC $\pm 10 \text{ K}$ Rated voltage AC Rated current AC cos $\phi = 1.0 / \text{ cycles}$ 120 °C ±15 K Rated current AC cos $\phi = 0.6 / \text{ cycles}$ VDE< ≥ 35 °C Total bounce time from 6.0 mm Contact resistance (according to MIL-STD. R5757) 11.0 mm Vibration resistance at 10 60 Hz suitable I 300 N Lead wire AWG20

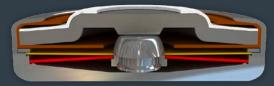
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

Type series 09









Construction and function

Switchgear consisting of a movable silver contact (1), a contact bearer (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a conductive, heat-transferring housing (5) and a contact cap made of steel (6) that is insulated from it, plus a stationary countercontact (7). At the same time, the switchgear is held open by the spring snap-in disc (3) used as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the movable contact (1), can continuously work (exposed) by mechanical loads. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contact is abruptly closed. The spring snap-in disc (3) is now a transfer element for electric current and as such, it enables the bimetallic disc (5) to continue to work on a continuous basis. When the spring back temperature is reached, the bimetallic disc snaps back into its start position and the contact is opened again.



Type: Normally open; resets automatically; with connector cables; with or without epoxy; without insulation

Nominal switching temperature (NST) in 5 °C	50 ℃ — 180 ℃
increments	
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 30 °C (≤ 75 °C NST)
(defined RST is possible at -30 K \pm	15 K (≥ 80 °C ≤ 180 °C NST)
the customer's request) VDE	≥ 35 °C
Installation height	from 5.0 mm
Diameter	11.0 mm
Resistance to impregnation *	suitable
Suitable for installation in protection class	
Pressure resistance to the switch housing *	300 N
Standard connection	Lead wire 0.5 mm ² / AWG20
Available approvals (please state)	IEC; ENEC; VDE;
	UL; CSA; CQC, CMJ

Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Vibration resistance at 10 60 Hz	100 m / s ²



Type: Normally open; resets automati	cally; with connector c	ables; with or without epoxy; insulatio	n: Mylar®-Nomex®
Nominal switching temperature (NST) in 5 $^\circ\!\!\!C$ increments	50 °C — 180 °C	Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC, CMJ
Tolerance (standard)	±5 K	Operating voltage range AC	up until 500.0 V AC
Reverse Switch Temperature UL	≥ 30 °C (≤ 75 °C NST)	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
(defined RST is possible at $-30 \text{ K} \pm 15$	K (≥ 80 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
the customer's request) VDE	≥ 35 °C	Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Installation height	from 5.5 mm	High voltage resistance	2.0 kV
Diameter	11.7 mm	Total bounce time	< 1 ms
Length of the insulation cap	19.0 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Resistance to impregnation *	suitable	Vibration resistance at 10 60 Hz	100 m / s ²
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	300 N		
Standard connection L	ead wire 0.5 mm ² / AWG20		

T **inemik**®

4.0 A - 25.0 A Thermal protectors



Type: Normally open	; resets autom	atically; wit	h connector	cables; with epox
Nominal switching tempera	ture (NST) in 5 °C in	crements	50 °C − 180 °C	Operating voltage
Tolerance (standard)	-		±5 K	Rated voltage AC
Reverse Switch Temperature	UL	≥ 30 °C	(≤ 75 °C NST)	Rated current AC co
(defined RST is possible at	-30 K ±	: 15 K (≥ 80 °C	≤ 180 °C NST)	Rated current AC co
the customer's request)	VDE		≥ 35 ℃	Rated voltage DC
Housing height			from 8.0 mm	High voltage resist
Diameter			12.0 mm	Total bounce time
Thread / Length			M6 x 8.0 mm	Contact resistance (a
Width across flats / Max. to	rque	1	3.0 mm / 8 Nm	Vibration resistance
Resistance to impregnation	*		suitable	-
Suitable for installation in p	protection class		+	
Pressure resistance to the sy	witch housing *		300 N	-
Standard connection		Lead wire 0.5	mm ² / AWG20	
Available approvals (please	state)		EC; ENEC; VDE;	
			UL; CSA; CQC	

ables; with epoxy; fully insulated in a so	rew on housing
Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
Rated voltage DC	12.0 V
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



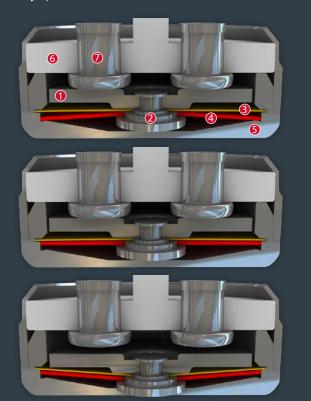
Type: Normally open; resets automatically; with connector cables; with epoxy; fully insulated in a Nomex® cap

Numical autobio standard (NCT) is 5.90	50.00 100.00	On anti-	
Nominal switching temperature (NST) in 5 °C	50 °C — 180 °C	Operating voltage range AC	up until 500.0 V AC
increments		Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Tolerance (standard)	±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	6.3 A / 10,000
Reverse Switch Temperature UL	≥ 30 °C (≤ 75 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	4.0 A / 10,000
(defined RST is possible at $-30 \text{ K} \pm 15$	K (≥ 80 °C ≤ 180 °C NST)	High voltage resistance	2.0 kV
the customer's request) VDE	≥ 35 °C	Total bounce time	< 1 ms
Installation height	from 6.5 mm	Contact resistance (according to MIL-STD. R5757)	$\leq 50 \text{ m}\Omega$
Diameter	11.4 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *	suitable		
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	300 N		
Standard connection Le	ad wire 0.5 mm ² / AWG20		
Available approvals (please state)	IEC; ENEC; VDE;		
	UL; CSA; CQC		

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

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Type series 06



Construction and function

Switchgear consisting of a mobile and circular contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a non-conductive floor of a housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7) as electrodes. At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snapin disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts are abruptly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined reset temperature and the contacts will be closed again. As the contact bearing pin (2) is appropriately dimensioned, an easy, circular rotation of the circle-shaped contact bridge (1) is enabled with every switch so that transfer resistances remain constantly below the minimum limit after many switch cycles and the long term stability is sustained even under high levels of stress.



Type: Normally closed; resets automatically	; with connector	cables; with epoxy; without insul	ation
Nominal switching temperature (NST) in 5 $^{\circ}$	70 °C — 200 °C	Operational voltage range AC / DC	un

Norminal switching temperature (NST) in S. C.		70 C - 200 C	
increments			
Tolerance (standard)			±5 K
Reverse Switch Temperature	UL		≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at		-50 K ± 1	15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request)		-65 K ± 1	15 K (≥ 185 °C ≤ 200 °C NST)
	VDE		≥ 35 °C
Installation height			from 6.5 mm
Diameter			9.0 mm
Resistance to impregnation	*		suitable
Suitable for installation in p	orotectio	in class	
Pressure resistance to the st	witch ho	ousing *	600 N
Standard connection			Lead wire 0.75 mm ² / AWG18
Available approvals (please	state)		IEC; ENEC; VDE; UL; CSA; CQC

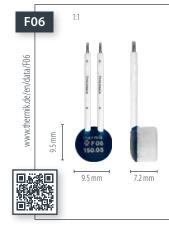
Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
Max. switching current AC $\cos \Phi = 1.0$ / cycles	25.0 A / 100
Rated voltage DC	24.0 V
Max. switching current DC / cycles	40.0 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Type: Normally closed; resets automatically; with connector cables; with epoxy; insulation: Mylar $^{\circ}$ -Nomex $^{\circ}$				
Nominal switching temperature (NST) in 5 °C 70 °C – 200 °C increments Tolerance (standard) ±5 K	Available approvals (please state) Operational voltage range AC / DC Rated voltage AC	IEC; ENEC; VDE; UL; CSA; CQC up until 500.0 V AC / 28.0 V DC 250.0 V (VDE) 277.0 V (UL)		
Interface (standard) \pm 5 k Reverse Switch Temperature UL \geq 35 °C (\leq 95 °C NST) (defined RST is possible at -50 K ± 15 K (\geq 100 °C \leq 180 °C NST)	Rated voltage AC Rated current AC cos $\phi = 1.0 / \text{cycles}$ Rated current AC cos $\phi = 0.6 / \text{cycles}$	10.0 A / 10,000 6.3 A / 10,000		
the customer's request) $-65 \text{ K} \pm 15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C NST})$	Max. switching current AC $\cos \Phi = 1.0$ / cycles	25.0 A / 100		
VDE \geq 35 °C Installation height from 7.0 mm	Rated voltage DC Max. switching current DC / cycles	24.0 V 40.0 A / 3,000		
Diameter 10.5 mm Length of the insulation cap 17.5 mm	High voltage resistance Total bounce time	2.0 kV < 1 ms		
Resistance to impregnation * suitable Suitable for installation in protection class I + II	Contact resistance (according to MIL-STD. R5757) Vibration resistance at 10 60 Hz	$\leq 50 \text{ m}\Omega$ 100 m / s ²		
Pressure resistance to the switch housing * 600 N Standard connection Lead wire 0.75 mm² / AWG18				



4.0 A - 25.0 A Thermal protectors



lype: Normally closed	i; rese	ets automatically	; with connecto
Nominal switching temperate	ure (NS	ST) in 5 °C increments	70 °C − 200 °C
Tolerance (standard)			±5 K
Reverse Switch Temperature	UL	≥ 3	35 °C (≤ 95 °C NST)
(defined RST is possible at		-50 K ± 15 K (≥ 10	$0 ^{\circ}\text{C} \le 180 ^{\circ}\text{C} \text{NST}$
the customer's request)		-65 K±15 K (≥18	5 °C ≤ 200 °C NST)
	VDE		≥ 35 °C
Installation height			from 7.2 mm
Diameter			9.5 mm
Resistance to impregnation *	÷		suitable
Suitable for installation in pr	otectio	on class	+
Pressure resistance to the sw	itch h	ousing *	600 N
Standard connection		Lead wire	0.75 mm² / AWG18
Available approvals (please s	state)	IEC; ENEC;	VDE; UL; CSA; CQC

Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V
Rated voltage AC	250.0 V (VDE) 277.0 V (L
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,0
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,0
Max. switching current AC $\cos \Phi = 1.0$ / cycles	25.0 A / 1
Rated voltage DC	24.0
Max. switching current DC / cycles	40.0 A / 3,0
High voltage resistance	2.0
Total bounce time	< 1 r
Contact resistance (according to MIL-STD. R5757)	≤ 50 n
Vibration resistance at 10 60 Hz	100 m /



Nominal switching temperature (NST) in 5 °C	205 ℃ — 250 ℃	Operating voltage range AC	up until 500.0 V /
ncrements		Rated voltage AC	250.0 V (VDE) 277.0 V (U
Folerance (standard)	±10 K	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,0
Reverse switch temperature (RST) below NST	UL 120 °C ±15 K	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,0
defined RST is possible at the customer's request)	'DE ≥ 35 °C	Total bounce time	<1
nstallation height	from 7.1 mm	Contact resistance (according to MIL-STD. R5757)	≤ 50 r
Diameter	9.0 mm	Vibration resistance at 10 60 Hz	100 m.
Resistance to impregnation *	suitable	-	
Suitable for installation in protection class		-	
Pressure resistance to the switch housing *	600 N	-	
Standard connection Lead	wire 0.75 mm ² / AWG18	-	
Available approvals (please state)	IEC; ENEC; VDE;		
	JL (appr. ≤ 230 °C); CQC		



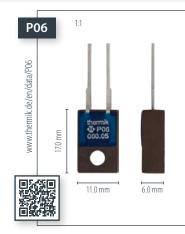
Nominal switching temperature (NST) in 5 °C		205 °C − 250 °C	Operating voltage range AC	up until 500.0 V
increments			Rated voltage AC	250.0 V (VDE) 277.0 V (U
Tolerance (standard)		±10 K	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,0
Reverse switch temperature (RST) below NST	UL	120 °C ±15 K	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,0
(defined RST is possible at the customer's request)	VDE	≥ 35 °C	High voltage resistance	2.0
nstallation height		from 7.8 mm	Total bounce time	<1
Diameter		9.7 mm	Contact resistance (according to MIL-STD. R5757)	≤ 50 r
Length of the insulation cap		22.0 mm	Vibration resistance at 10 60 Hz	100 m ,
Resistance to impregnation *		suitable		
Suitable for installation in protection class		+		
Pressure resistance to the switch housing *		600 N		
Standard connection	Lead wire	0.75 mm ² / AWG18		
Available approvals (please state)		IEC; ENEC; VDE;		
	UL (a	appr. \leq 230 °C); CQC		

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-06		я	20		
www.thermik.de/en/data/L06	10.0 mm	THERMIK R	THERMIK R		
		11.0	mm		13.5 mm

Type: Normally closed; resets	automatically; with connector	cables; with epoxy; fully insulated in a	a screw on housing
Nominal switching temperature (NST) i	n 5 °C increments 70 °C – 200 °C	Available approvals (please state)	IEC; ENEC; VDE; UL; CSA
Tolerance (standard)	±5 K	Operational voltage range AC / DC	up until 500.0 V AC / 28.0
Reverse Switch Temperature UL	\geq 35° C (\leq 95 °C NST)	Rated voltage AC	250.0 V (VDE) 277.0 V
(defined RST is possible at	$-50 \text{ K} \pm 15 \text{ K} (\ge 100 \text{ °C} \le 180 \text{ °C} \text{ NST})$	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1
the customer's request)	-65 K ± 15 K (≥ 185 °C ≤ 200 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1
VDE	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cycles	25.0 A
Installation height	from 5.0 mm	Rated voltage DC	2
Diameter	10.0 mm	Max. switching current DC / cycles	40.0 A /
Thread/Length	M6 x 8.0 mm	High voltage resistance	2
Width across flats/Max. torque	10.0 mm / 2 Nm	Total bounce time	<
Resistance to impregnation *	suitable	Contact resistance (according to MIL-STD. R5757)	≤ 5
Suitable for installation in protection of	lass +	Vibration resistance at 10 60 Hz	100
Pressure resistance to the switch housi	ng * 600 N		
Standard connection	Lead wire 0.75 mm ² / AWG18		

	<u> </u>
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC
Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	25.0 A / 100
Rated voltage DC	24.0 V
Max. switching current DC / cycles	40.0 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

Thermal protectors 4.0 A - 25.0 A



l Type: Normally closed; resets	automatically; with connection pi
Nominal switching temperature (NST) Tolerance (standard)	<u>in 5 ℃ increments 70 ℃ – 200 ℃</u> ±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at	-50 K ± 15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request)	$-65 \text{ K} \pm 15 \text{ K} (\ge 185 \text{ °C} \le 200 \text{ °C NST})$
VDE	≥ 35 °C
Installation height	from 6.0 mm
Housing size (length / width)	17.0 mm / 11.0 mm
Length of the connection pins	18.0 mm
Fixing / Max. torque	3.0 Nm
Resistance to impregnation *	suitable
Suitable for installation in protection	
Pressure resistance to the switch house	sing * 600 N
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC

ייק	ns, while epoxy, runy insulated in the c	ittaciment nousing
	Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V DC
	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
	Max. switching current AC cos $\Phi = 1.0$ / cycles	25.0 A / 100
	Rated voltage DC	24.0 V
	Max. switching current DC / cycles	40.0 A / 3,000
_	High voltage resistance	2.0 kV
	Total bounce time	< 1 ms
	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
	Vibration resistance at 10 60 Hz	100 m / s ²

H06 2 www.thermik.de/en/data/H06 17.0 mm 7.5 mm 11.0 mm

Type: Normally closed; resets automatically; with connector cables; with ep	poxy; fully insulated in the attachment housing
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	oltage range AC / DC up until 500.0 V AC / 28.0 V D e AC 250.0 V (VDE) 277.0 V (UI) : AC cos $\phi = 1.0$ / cycles 10.0 A / 10,00 : AC cos $\phi = 0.6$ / cycles 6.3 A / 10,00 : g current AC cos $\phi = 1.0$ / cycles 25.0 A / 10,00 : DC 24.0 : ac current DC / cycles 40.0 A / 3,00 : resistance 2.0 k

Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V DC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
Max. switching current AC cos $\phi = 1.0$ / cycles	25.0 A / 100
Rated voltage DC	24.0 V
Max. switching current DC / cycles	40.0 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

hment housing



Type: Normally closed; resets a	utomatically; with connector	cables and double-insulated in the c	attachment housing
Nominal switching temperature (NST) in 5	5 ℃ 70 ℃ – 180 ℃	Operational voltage range AC / DC	up until 500.0 V AC / 28.0 V DC
increments		Rated voltage AC	250.0 V (VDE)
Tolerance (standard)	±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
(defined RST is possible at -50	$100 \text{ K} \pm 15 \text{ K} (\ge 100 ^{\circ}\text{C} \le 180 ^{\circ}\text{C} \text{ NST})$	Max. switching current AC $\cos \Phi = 1.0$ / cycles	25.0 A / 100
the customer's request) VDE	≥ 35 °C	Rated voltage DC	24.0 V
Installation height	from 10.0 mm	Max. switching current DC / cycles	40.0 A / 3,000
Housing size (length / width)	26.0 mm / 13.5 mm	High voltage resistance	3.75 kV
Fixing/Max. torque	2.5 Nm	Total bounce time	< 1 ms
Resistance to impregnation *	suitable	Contact resistance (according to MIL-STD. R5757)	≤ 50 mΩ
Suitable for installation in protection class	is II	Vibration resistance at 10 60 Hz	100 m / s ²
Pressure resistance to the switch housing	* 600 N		
Standard connection	Lead wire 0.5 mm ² / AWG20		
Available approvals (please state)	IEC; ENEC; VDE; CQC		
	UL; CSA		

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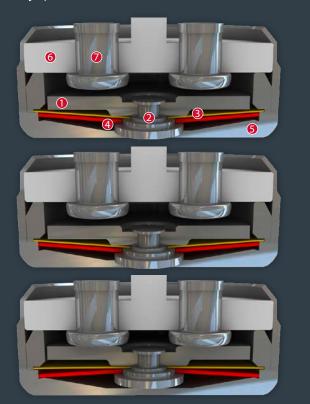


4.0 A - 25.0 A Thermal protectors

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

Type series 08





Construction and function

Switchgear consisting of a mobile and circular contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a non-conductive floor of a housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7) as electrodes. At the same time, the switchgear is initially held open by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current after the switching process) which is fastened between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the distance between the contact surfaces (defined by the spring snap-in disc (3)) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts (7) are abruptly closed. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined spring back temperature and the contacts will be abruptly opened again. As a result of the dimensioning of the contact bearing pin (2), an easy, circular rotation of the circle-shaped contact bridge (1) is enabled with every switch so that transfer resistances remain constantly below the minimum limit after many switch cycles and the long term stability is sustained even under high levels of stress.

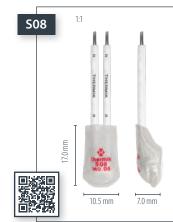


Nominal switching temperature (N	IST) in 5 °C increments	70 ℃ – 180 ℃	Operating voltage range
Tolerance (standard)		±5 K	Rated voltage AC
Reverse Switch Temperature UL	≥3	5 °C (≤ 95 °C NST)	Rated current AC $\cos \Phi$
(defined RST is possible at	–50 K \pm 15 K (\geq 10	0 °C ≤ 180 °C NST)	Rated current AC $\cos \Phi$
the customer's request) VDE		≥ 35 °C	Total bounce time
Installation height		from 6.5 mm	Contact resistance (accord
Diameter		9.0 mm	Vibration resistance at 1
Resistance to impregnation *		suitable	
Suitable for installation in protect	ion class		
Pressure resistance to the switch	nousing *	600 N	
Standard connection	l ead wire	0.75 mm ² / AWG18	

Available approvals (please state)

IEC; ENEC; VDE; UL; CSA; CQC

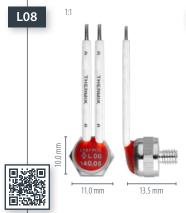
Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Type: Normally open; resets autor	matically; with connector c	ables; with epoxy; insulation: Mylar®-N	lomex®
Nominal switching temperature (NST) in 5 °C		Operating voltage range AC	up until 500.0 V AC
Tolerance (standard)	±5 K	Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL	\geq 35° C (\leq 95 °C NST)	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
(defined RST is possible at -50 K =	± 15 K (≥ 100 °C ≤ 180 °C NST)	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
the customer's request) VDE	≥ 35 °C	High voltage resistance	2.0 kV
Installation height	from 7.0 mm	Total bounce time	< 1 ms
Diameter	10.5 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Length of the insulation cap	17.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *	suitable		
Suitable for installation in protection class	+		
Pressure resistance to the switch housing *	600 N		
Standard connection	Lead wire 0.75 mm ² / AWG18		
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC		

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Thermal protectors 4.0 A - 25.0 A



lype: Normally open; resets autom	atically; with connector o
Nominal switching temperature (NST) in 5 °C in	ncrements 70 °C – 180 °C
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at -50 K \pm	15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request) VDE	≥ 35 ℃
Installation height	from 5.0 mm
Diameter	10.0 mm
Thread / Length	M4 x 5.0 mm
Width across flats / Max. torque	10.0 mm / 2 Nm
Resistance to impregnation *	suitable
Suitable for installation in protection class	+
Pressure resistance to the switch housing *	600 N
Standard connection	Lead wire 0.75 mm ² / AWG18

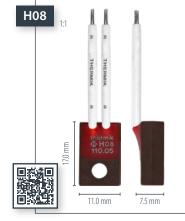
ables; with epoxy; fully insulated in a screw on housing

Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC
Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Nominal switching temperature (NST) in 5 °C in	ncrements 70 °C – 180 °C
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at -50 K ±	: 15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request) VDE	≥ 35 °C
Installation height	from 6.0 mm
Housing size (length / width)	17.0 mm / 11.0 mm
Length of the connection pins	18.0 mm
Fixing/Max. torque	3.0 Nm
Resistance to impregnation *	suitable
Suitable for installation in protection class	+
Pressure resistance to the switch housing *	600 N
Standard connection	Lead wire 0.75 mm ² / AWG18

Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC
Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Type: Normally open; resets automatically; with connector cables; with epoxy; fully insulated in the attachment housing

Nominal switching temperature (NST) in 5 °C in	ncrements 70 °C – 180 °C
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at -50 K ±	$15 \text{ K} (\ge 100 \text{ °C} \le 180 \text{ °C} \text{ NST})$
the customer's request) VDE	≥ 35 °C
Installation height	from 7.5 mm
Housing size (length / width)	17.0 mm / 11.0 mm
Fixing / Max. torque	3.0 Nm
Resistance to impregnation *	suitable
Suitable for installation in protection class	+
Pressure resistance to the switch housing *	600 N
Standard connection	Lead wire 0.75 mm ² / AWG18
Available approvals (please state)	IEC; ENEC; VDE; UL; CSA; CQC

Suitable for installation in protection class

Pressure resistance to the switch housing *

Available approvals (please state)

Standard connection

Operating voltage range AC	up until 500.0 V AC
Rated voltage AC	250.0 V (VDE) 277.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 10,000
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

up until 500.0 V AC

10.0 A / 10,000

6.3 A / 10,000

3.75 kV

< 1 ms

 $\leq 50 \text{ m}\Omega$

100 m / s²



Type: Normally open; resets automatically; with connector cables and double-insulated in the attachment housing Nominal switching temperature (NST) in 5 °C increments 70 °C - 180 °C Operating voltage range AC Rated voltage AC 250.0 V (VDE) 277.0 V (UL) Tolerance (standard) +5 K Reverse Switch Temperature UL \geq 35 °C (\leq 95 °C NST) Rated current AC cos $\Phi = 1.0$ / cycles (defined RST is possible at $-50 \text{ K} \pm 15 \text{ K} (\ge 100 \text{ }^{\circ}\text{C} \le 180 \text{ }^{\circ}\text{C} \text{ NST})$ Rated current AC cos $\Phi = 0.6$ / cycles the customer's request) ≥ 35 °C High voltage resistance VDE Installation height from 10.0 mm Total bounce time Contact resistance (according to MIL-STD. R5757) 26.0 mm / 13.5 mm Housing size (length / width) Fixing / Max. torque 2.5 Nm Vibration resistance at 10 ... 60 Hz Resistance to impregnation * suitable

11 600 N

Lead wire 0.5 mm² / AWG20

IEC; ENEC; VDE; CQC

Type: Normally open; resets automatically; with connection pins; with epoxy; fully insulated in the attachment housing

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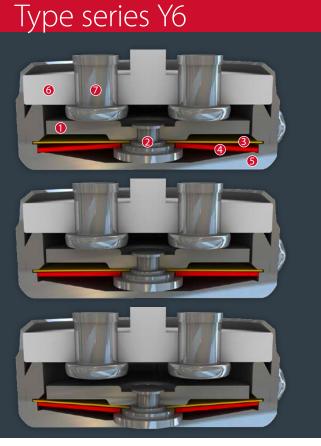
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The **Cherner**

4.0 A – 25.0 A Thermal protectors

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





Construction and function

Switchgear consisting of a mobile and circumferential contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between the floor of a conductive housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7) as electrodes. At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snapin disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts are abruptly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined reset temperature and the contacts will be abruptly closed again. As the contact bearing pin (2) is appropriately dimensioned, an easy, circular rotation of the circle-shaped contact bridge (1) is enabled with every switch so that transfer resistances remain constantly below the minimum limit after many switch cycles and the long term stability is sustained even under high levels of stress. Through an additional outer connection to the switch housing, the Thermal protectors can be operated in a threephase arrangement. In this case the current flow is interrupted during operation through each phase.



	nee phase ne canent ase in t
Nominal switching temperature (NST) in 5 $^\circ$ C increments	70 °C − 180 °C
Tolerance (standard)	±5 K
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at $$-50\ {\rm K}\ \pm$	15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request)	
Installation height	from 6.5 mm
Diameter	9.0 mm
Resistance to impregnation *	suitable
Suitable for installation in protection class	
Pressure resistance to the switch housing *	600 N
Standard connection	Lead wire 0.5 mm ² / AWG20
Available approvals (please state)	UL; CSA; CQC

the star point, resets automatically, min epony	, manoa a moana ao m
Operational voltage range AC / DC	up until 440.0 V AC
Rated voltage AC	3x 440.0 V 50 / 60 Hz
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Max. switching current AC cos $\phi = 1.0$ / cycles	6.3 A / 3,000
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²



Nominal switching temperature (NST) in 5	°C increments 70 °C − 180 °C	0
Tolerance (standard)	±5 K	Ra
Reverse Switch Temperature UL	≥ 35 °C (≤ 95 °C NST)	Ra
(defined RST is possible at -50	$K \pm 15 \text{ K} (\geq 100 \text{ °C} \leq 180 \text{ °C NST})$	М
the customer's request)		Hi
Installation height	from 7.0 mm	To
Diameter	10.5 mm	Co
Length of the insulation cap	16.0 mm	Vi
Resistance to impregnation *	suitable	
Suitable for installation in protection class	; +	
Pressure resistance to the switch housing	* 600 N	
Standard connection	Lead wire 0.5 mm ² / AWG20	
Available approvals (please state)	UL; CSA; CQC	

Operational voltage range AC / DC	up until 440.0 V AC
Rated voltage AC	3x 440.0 V 50 / 60 Hz
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	6.3 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

*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 conforming my their standards. The responsibility of Thermik products for such applications falls upon the energy of their capacity to support an application 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, approved, etc. can be supplied upon request. The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

Switchgear consisting of a mobile and circumferential contact bridge (1),

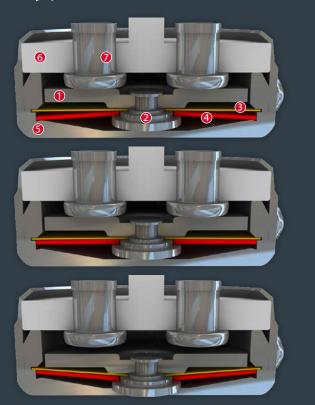
a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between the floor of a conductive housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7) as electrodes. At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snapin disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts are abruptly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined reset temperature and the contacts will be abruptly closed again. As the contact bearing pin (2) is appropriately dimensioned, an easy, circular rotation of the circle-shaped contact bridge (1) is enabled with every switch so that transfer resistances remain constantly below the minimum limit after many switch cycles and the long term stability is sustained even under high levels of stress. Through an additional outer connection to the switch housing, the Thermal protectors can be operated in a threephase arrangement. In this case the current flow is interrupted

Construction and function

during operation through each phase.

Type series YH







70 °C − 180 °C	(
±10 K	
≥ 35 °C (≤ 95 °C NST)	
15 K (≥ 100 °C ≤ 180 °C NST)	
	(
from 6.5 mm	1
9.0 mm	
suitable	
600 N	
Lead wire 1.0 mm ² / AWG18	-
	±10 K ≥ 35 °C (≤ 95 °C NST) 15 K (≥ 100 °C ≤ 180 °C NST) from 6.5 mm 9.0 mm suitable I 600 N

Type: Three-pole (normally closed) for three phase AC curr

use in t	the star point; resets automatically; with epoxy	y; without insulation	
-			
0°C	Operating voltage range AC	up until 440.0 V AC	
	Rated voltage AC	3x 440.0 V 50 / 60 Hz	
10 K	Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000	
√ST)	Max. switching current AC $\cos \Phi = 1.0$ / cycles	12.0 A / 3,000	
√ST)	Total bounce time	< 1 ms	
	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω	
mm	Vibration resistance at 10 60 Hz	100 m / s ²	
mm			



Nominal switching temperature (NS	T) in 5 ℃	70 °C − 180 °C
increments		
Tolerance (standard)		±10 K
Reverse Switch Temperature UL		≥ 35 °C (≤ 95 °C NST)
(defined RST is possible at	$-50~\mathrm{K}\pm$	15 K (≥ 100 °C ≤ 180 °C NST)
the customer's request)		
Installation height		from 7.0 mm
Diameter		10.5 mm
Length of the insulation cap		16.0 mm
Resistance to impregnation *		suitable
Suitable for installation in protectio	n class	+
Pressure resistance to the switch ho	using *	600 N
Standard connection		Lead wire 1.0 mm ² / AWG18

Operating voltage range AC	up until 440.0 V AC
Rated voltage AC	3x 440.0 V 50 / 60 Hz
Rated current AC cos $\Phi = 1.0$ / cycles	2.5 A / 10,000
Max. switching current AC cos $\Phi = 1.0$ / cycles	12.0 A / 3,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Vibration resistance at 10 60 Hz	100 m / s ²

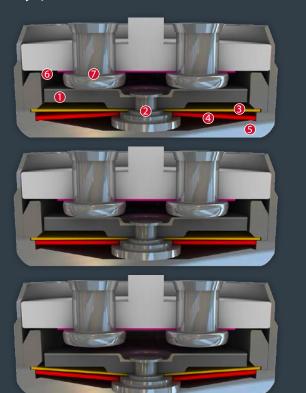


4.0 A - 25.0 A Thermal protectors

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

Type series R6





Construction and function

Switchgear consisting of a mobile and circumferential contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a non-conductive floor of a housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7) as electrodes. At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snapin disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts (7) are abruptly opened. The resistance ceramic (6) switched in parallel now sustains the operating voltage and deploys a defined electrical heating output on the switchgear regardless of the ambient temperature and permanently sustains it above its springback temperature so that the switchgear cannot reset back. The contacts remain 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.



Nominal switching temperature (NST) in 5 °C		70 ℃ — 180 ℃	Operational voltage range AC / DC	up until 250.
increments			Rated voltage AC	230.0 V (VDE) 250.0 V
Tolerance NST ≤ 140 °C		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A /
Tolerance NST > 140 ℃		±10 K	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A /
Reverse switch temperature (RST) below NST	VDE	≥ 35 °C	Max. switching current AC cos $\phi = 1.0$ / cycles	25.0 A /
(defined RST is possible at the customer's request)		≥ 35 °C	Total bounce time	<
Installation height		from 6.5 mm	Contact resistance (according to MIL-STD. R5757)	≤ 5
Diameter		9.0 mm	Vibration resistance at 10 60 Hz	100
Resistance to impregnation *		suitable		
Suitable for installation in protection class				
Pressure resistance to the switch housing *		600 N		
Standard connection	Lead wire 0	.75 mm² / AWG18		
Available approvals (please state)	IEC; ENEC; \	/DE; UL; CSA; CQC		



Type: Normally closed; does not reset o	automat	ically; voltage ap	plied; with connector cables; with epoxy	; insulation: Mylar®-Nome
Nominal switching temperature (NST) in 5 °C increments		70 °C — 180 °C	Operational voltage range AC / DC Rated voltage AC	up until 250.0 V AC 230.0 V (VDE) 250.0 V (UL)
Tolerance NST ≤ 140 °C		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000
Tolerance NST > 140 ℃		±10 K	Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000
Reverse switch temperature (RST) below NST	VDE	≥ 35 °C	Max. switching current AC cos $\phi = 1.0$ / cycles	25.0 A / 1,000
(defined RST is possible at the customer's request)		≥ 35 °C	High voltage resistance	2.0 kV
Installation height		from 7.0 mm	Total bounce time	< 1 ms
Diameter		10.7 mm	Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω
Length of the insulation cap		17.5 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *		suitable		
Suitable for installation in protection class		+		
Pressure resistance to the switch housing *		600 N		
Standard connection	ead wire 0	.75 mm² / AWG18		
Available approvals (please state)	EC; ENEC; \	/DE; UL; CSA; CQC		

·····, ·······················, ········		
Operational voltage range AC / DC	up until 250.0 V AC	
Rated voltage AC	230.0 V (VDE) 250.0 V (UL)	
Rated current AC cos $\Phi = 1.0$ / cycles	10.0 A / 1,000	
Rated current AC cos $\Phi = 0.6$ / cycles	6.3 A / 1,000	
Max. switching current AC cos $\Phi = 1.0$ / cycles	25.0 A / 1,000	
High voltage resistance	2.0 kV	
Total bounce time	< 1 ms	
Contact resistance (according to MIL-STD. R5757)	\leq 50 m Ω	
Vibration resistance at 10 60 Hz	100 m / s ²	

Thermal protectors 13.5 A - 42.0 A

Thermal Protectors

For the following Thermik thermal protector Product Series, frequent customer-requested variations are shown to the right:

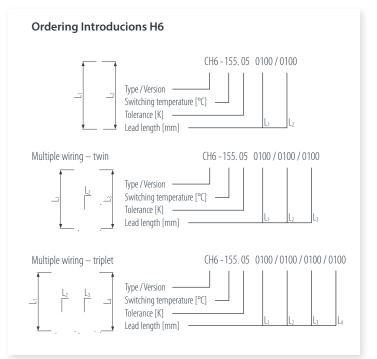
H6 RH

Thermik creates endless customized modifications within this Product Series, including customer-application solutions. Thermik's patented engineering in our standard configurations of this Product Series extends to all our custom solutions.

Our rigorous quality processes ensure precision-engineering consistency - in design and manufacture - plant-to-plant, worldwide - and on each order, for both standard and custom specifications.

By design, Thermik's selection of materials, and their composition, requires only the highest-quality materials enter Thermik's supply chain and are used in Thermik products. We source for quality and reliability, over price. From experience, the quality of our precision engineering products depends on it!

Due to their superior electromechanical properties, the use of precious metals is necessary for Thermik products. Thermik's Engineering Center of Excellence sources locally, within Europe, to assure our quality standards, and further assure our compliance with the international "Conflict-Free Minerals Directive" for special metals! Thermik's eco-friendly products also comply fully with EU Directives on RoHS and REACH.



Examples of typical applications



















ENEC in accordance with CMJ in accor-EN 60730

Thermik products are in accordance with the applicable EU directives/ specifications, as amended.

dance with dance with EN 60730 GB 14536

2111/UL 873 UL 60730

dance with UL dance with dance with IEC 0730

IFT

dance with

CE

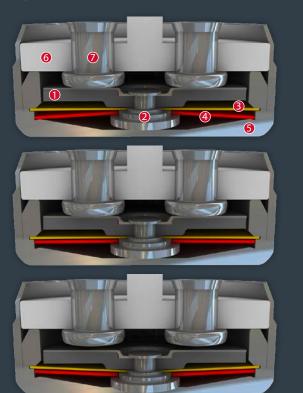


13,5 A – 42.0 A Thermal protectors

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

Type series H6





Construction and function

Switchgear consisting of a mobile and circular contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a non-conductive floor of a housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7). At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snap-in disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts are abrubtly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined spring back temperature and the contacts are abruptly closed again. As a result of the dimensioning of the contact bearing pin (2), an easy, circular rotation of the circle-shaped contact bridge is enabled with every switch so that transfer resistances remain constantly below the minimum limit after many switch cycles and the long term stability is sustained even under high levels of stress.



Type: Normally closed; resets automatically; with connecto	r cables; v
Nominal switching temperature (NST) in 5 °C increments $70 °C - 200 °C$	Operatir
Tolerance NST \leq 140 °C \pm 5 K	Rated vo
Tolerance NST > 140 °C \pm 10 K	Rated cu
Reverse Switch TemperatureUL \geq 35 °C (\leq 130 °C NST	Rated cu
(defined RST is possible at $-85 \text{ K} \pm 15 \text{ K}$ ($\geq 135 \text{ °C} \leq 190 \text{ °C} \text{ NST}$)	Rated cu
the customer's request) $-90 \text{ K} \pm 15 \text{ K} (\ge 195 \text{ °C} \le 200 \text{ °C NST})$	
VDE \geq 35 °C	Rated vo
Installation height from 6.6 mm	Max. sw
Diameter 9.0 mm	Total bo
Resistance to impregnation * suitable	Contact r
Suitable for installation in protection class	Vibratio
Pressure resistance to the switch housing * 600 N	
Standard connection Lead wire 1.0 mm ² / AWG18	
Available approvals (please state) IEC; VDE; UL; CQC; CMJ; ENEC	

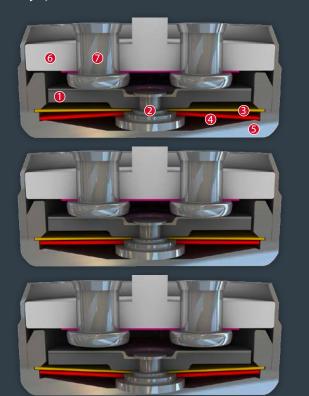
50.0 V (VDE) 277.0 V (UL) 13.5 A / 10,000 9.0 A / 10,000 35.0 A* / 2,000
9.0 A / 10,000
,
35.0.4*/2.000
JJ.U A / 2,000
42.0 A / 300
24.0 V (VDE, UL)
60.0 A / 3,000
< 1 ms
\leq 50 m Ω
100 m / s ²



Type: Normally closed; resets automatically; with connector	cables; with epoxy; insulation: Mylar®-Nomex®
Nominal switching temperature (NST) in 5 °C increments 70 °C $-$ 200 °C	Available approvals (please state) IEC; VDE; UL; CQC; CMJ; ENEC
Tolerance NST \leq 140 °C \pm 5 K	Operating voltage range AC / DC up until 500.0 V AC / 28.0 V DC
Tolerance NST > 140 ℃ ±10 K	Rated voltage AC 250.0 V (VDE) 277.0 V (UL)
Reverse Switch Temperature UL ≥ 35 °C (≤ 130 °C NST	Rated current AC cos $\phi = 1.0$ / cycles 13.5 A / 10,000
(defined RST is possible at $-85 \text{ K} \pm 15 \text{ K}$ ($\geq 135 ^{\circ}\text{C} \leq 190 ^{\circ}\text{C}$ NST)	Rated current AC cos $\phi = 0.6$ / cycles 9.0 A / 10,000
the customer's request) $-90 \text{ K} \pm 15 \text{ K} (\geq 195 \text{ °C} \leq 200 \text{ °C NST})$	Rated current AC cos $\phi = 1.0$ / cycles 35.0 A* / 2,000
VDE \geq 35 °C	42.0 A / 300
Installation height from 7.0 mm	Rated voltage DC 24.0 V (VDE, UL)
Diameter 10.7 mm	Max. switching current DC / cycles 60.0 A / 3,000
Length of the insulation cap 17.5 mm	High voltage resistance 2.0 kV
Resistance to impregnation * suitable	Total bounce time < 1 ms
Suitable for installation in protection class I + II	Contact resistance (according to MIL-STD. R5757) \leq 50 m Ω
Pressure resistance to the switch housing * 600 N	Vibration resistance at 10 60 Hz 100 m / s ²
Standard connection Lead wire 1.0 mm ² / AWG18	

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

Type series RH





Construction and function

Switchgear consisting of a mobile and circumferential contact bridge (1), a contact bearing pin (2), a spring snap-in disc (3) and a bimetallic disc (4) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a non-conductive floor of a housing (5) and an insulating ceramic bearing (6) with two integrated stationary contacts (7). At the same time, the switchgear is supported by the spring snap-in disc (3) with the contact bridge (1) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the bimetallic disc (4) underlying it, that is also stuck out from the contact bearing pin (2), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snap-in disc (3) diperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contacts (7) are abruptly opened. The resistance ceramic (6) switched in parallel now sustains the operating voltage and deploys a defined electrical heating output on the switchgear regardless of the ambient temperature and permanently sustains it above its springback temperature so that the switchgear cannot reset back. The contacts (7) remain 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.



Type: Normally closed; does not rese	tautom	ntically: voltage c	annlied with connector cables wit	th enoxy: without insulation
Type. Normany closed, does not rese	l'uutonne	alleally, voltage c	ipplied, with connector cables, with	n cpoxy, without insulation
Nominal switching temperature (NST) in 5 °C		70 °C − 180 °C	Operating voltage range AC	up until 250.0 V AC
increments			Rated voltage AC	120.0 V / 230.0 V (VDE) 250.0 V (UL)
Tolerance NST ≤ 140 °C		±5 K	Rated current AC cos $\Phi = 1.0$ / cycles	13.5 A / 300
Tolerance NST > 140 °C		±10 K	Rated current AC cos $\Phi = 0.6$ / cycles	9.0 A / 300
Reverse switch temperature (RST) below NST	UL	≥ 35 °C	Max. switching current AC cos $\Phi = 1.0$ / cy	cles 42.0 A / 300
(defined RST is possible at the customer's request)	VDE	≥ 35 °C	Total bounce time	< 1 ms
Installation height		from 6.5 mm	Contact resistance (according to MIL-STD. R5	757) $\leq 50 \text{ m}\Omega$
Diameter		9.0 mm	Vibration resistance at 10 60 Hz	100 m / s ²
Resistance to impregnation *		suitable		
Suitable for installation in protection class				
Pressure resistance to the switch housing *		600 N		
Standard connection	Lead wire	1.0 mm ² / AWG18		
Available approvals (please state)	IEC; E	NEC; VDE; UL; CSA		



Type. Normally closed, does not reset du	ιοπαιίει	iny, vonage appne
Nominal switching temperature (NST) in 5 °C increments		70 ℃ – 180 ℃
Tolerance NST \leq 140 °C		±5 K
Tolerance NST > 140 °C		±10 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 7.0 mm
Diameter		10.7 mm
Length of the insulation cap		17.5 mm
Resistance to impregnation *		suitable
Suitable for installation in protection class		+
Pressure resistance to the switch housing *		600 N
Standard connection	Lead wir	e 1.0 mm² / AWG18
Available approvals (please state)	IEC; I	ENEC; VDE; UL; CSA

Operating voltage range AC	up until 250.0 V AC
Rated voltage AC	120.0 V / 230.0 V (VDE) 250.0 V (UL)
Rated current AC cos $\Phi = 1.0$ / cycles	13.5 A / 300
Rated current AC cos $\Phi = 0.6$ / cycles	9.0 A / 300
Max. switching current AC cos $\Phi = 1.0$ / cy	/cles 42.0 A / 300
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5	$(757) \leq 50 \text{ m}\Omega$
Vibration resistance at 10 60 Hz	100 m / s ²

Thermal Protectors

For the following Thermik thermal protector Product Series, frequent customer-requested variations are shown to the right:

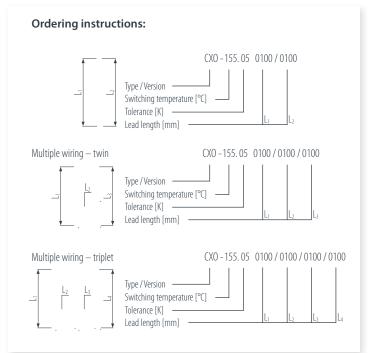
H5 хо XH

Thermik creates endless customized modifications within this Product Series, including customer-application solutions. Thermik's patented engineering in our standard configurations of this Product Series extends to all our custom solutions.

Our rigorous quality processes ensure precision-engineering consistency - in design and manufacture - plant-to-plant, worldwide - and on each order, for both standard and custom specifications.

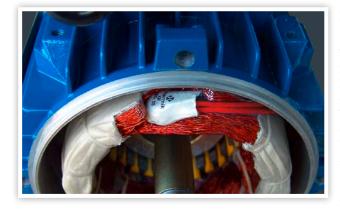
By design, Thermik's selection of materials, and their composition, requires only the highest-quality materials enter Thermik's supply chain and are used in Thermik products. We source for quality and reliability, over price. From experience, the quality of our precision engineering products depends on it!

Due to their superior electromechanical properties, the use of precious metals is necessary for Thermik products. Thermik's Engineering Center of Excellence sources locally, within Europe, to assure our quality standards, and further assure our compliance with the international "Conflict-Free Minerals Directive" for special metals! Thermik's eco-friendly products also comply fully with EU Directives on RoHS and REACH.



Examples of typical applications

















EN 60730



Thermik products are in accordance CE with the applicable EU directives/ specifications, as amended.

VDE in accordance with EN 60730

COC in accor-UL in accordance with dance with UL GB 14536 2111/UL 873 UL 60730

dance with

dance with IEC 0730

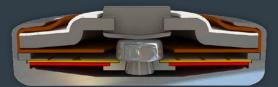
ENEC in accordance with CMJ in accordance with JFT

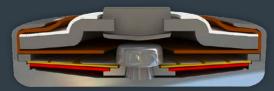
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

Type series H5









Construction and function

Switchgear consisting of a movable silver contact (1), a contact bearing pin (2), a spring snap-in disc (3), a bimetallic disc (4) and a contact tongue (5) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a conductive, heat transferring housing (6) and a contact cap (7) made of steel that is insulated from it, plus a stationary countercontact (8). At the same time, the switchgear is supported by the contact tongue (5) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the switchgear underlying it, that is also stuck out from the movable contact (1), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snap-in disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contact is abruptly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined spring back temperature and the contact is abruptly closed again.



Type: Normally clo	osed; resets automatico	ally; with connector c	ables; without e	poxy; without inst	ulation

Nominal switching temperature (NST) in S. C.		80 C - 180 C
increments		
Tolerance (standard)		±10 k
Reverse switch temperature (RST) below NST	UL	≥ 35 °(
(defined RST is possible at the customer's request)	VDE	≥ 35 °(
Installation height		from 5.0 mm
Diameter		11.0 mm
Suitable for installation in protection class		
Pressure resistance to the switch housing *		300 N
Standard connection		1.0 mm ² / AWG18
Available approvals (please state)		IEC; VDE; UL; CQC

	ics, without cpoxy, without insul	
0	perational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
R	ated voltage AC	250.0 V
R	ated current AC cos $\Phi = 1.0$ / cycles	30.0 A / 10,000
R	ated current AC cos $\Phi = 1.0$ / cycles	50.0 A / 3,000
R	ated voltage DC	12.0 V
N	1ax. switching current DC / cycles	60.0 A / 10,000
To	otal bounce time	< 1 ms
G	ontact resistance (according to MIL-STD. R5757)	< 25 mΩ
V	ibration resistance at 10 60 Hz	100 m / s ²
R R N To	ated current AC cos $\Phi = 1.0$ / cycles ated current AC cos $\Phi = 1.0$ / cycles ated voltage DC lax. switching current DC / cycles otal bounce time ontact resistance (according to MIL-STD. R5757)	30.0 A / 10,000 50.0 A / 3,000 12.0 V 60.0 A / 10,000 < 1 m < 25 m/



|--|

Nominal switching temperature (NST) in 5 °C		80 ℃ – 180 ℃
increments		
Tolerance (standard)		±10 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 6.0 mm
Diameter		from 11.7 mm
Length of the insulation cap		from 19.5 mm
Suitable for installation in protection class		+
Pressure resistance to the switch housing *		300 N
Standard connection		1.0 mm ² / AWG18
Available approvals (please state)		IEC; VDE; UL; CQC
Also available in a resistant impregnated version		

Operational voltage range AC / DC	up until 500.0 V AC / 14.0 V DC
Rated voltage AC	250.0 V
Rated current AC cos $\Phi = 1.0$ / cycles	30.0 A / 10,000
Rated current AC cos $\Phi = 1.0$ / cycles	50.0 A / 3,000
Rated voltage DC	12.0 V
Max. switching current DC / cycles	60.0 A / 10,000
High voltage resistance	2.0 kV
Total bounce time	< 1 ms
Contact resistance (according to MIL-STD. R5757)	< 25 mΩ
Vibration resistance at 10 60 Hz	100 m / s ²

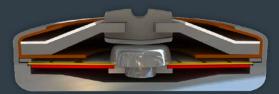
The listed products are an extract from our standard range. Other versions and customised manufacturing are available upon request.

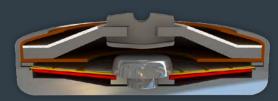
Zimen 3 25.0 A - 75.0 A Thermal protectors

Type series XO



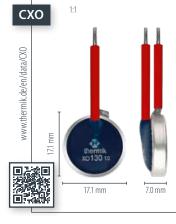






Construction and function

Switchgear consisting of a movable silver contact (1), a contact bearing pin (2), a spring snap-in disc (3), a bimetallic disc (4) and a contact tongue (5) which is riveted into one another, undetachable and fixed in a positive lock and self-aligning between a conductive, heat transferring housing (6) and a contact cap (7) made of steel that is insulated from it, plus a stationary countercontact (8). At the same time, the switchgear is supported by the contact tongue (5) acting as a transfer element for electric current which is held between a supporting collar and a circumferential ring. As such, the switchgear underlying it, that is also stuck out from the movable contact (1), can continuously work (exposed) by mechanical loads without the contact pressure defined by the spring snap-in disc (3) diminishing. As soon as the bimetallic disc (4) reaches its rated switching temperature, it effectively springs against the throw force of the spring snap-in disc (3) into its inverted position. The contact is abruptly opened. The temperature will now fall. The bimetallic disc (4) will only snap back upon reaching a defined spring back temperature and the contact is abruptly closed again.



Type: Normally closed; resets automatically; with connector cables; with epoxy; without insula

Nominal switching temperature (NST) in 5 °C in	crements	70 ℃ – 180 ℃
Tolerance (standard)		±10 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 5.9 mm
Diameter		17.1 mm
Resistance to impregnation *		suitable
Suitable for installation in protection class		
Pressure resistance to the switch housing *		600 N
Standard connection	Lead wire	1.75 mm ² / AWG14
Available approvals (please state)		IEC; VDE; UL; CQC

Operating voltage range AC / DC	up until 500.0 V AC / 14.0 V DC	
Rated voltage AC	250.0 V	
Rated current AC	25.0 A	
Max. switching current AC $\cos \Phi = 1.0$ / cycles	50.0 A / 10,000	
Max. switching current AC $\cos \Phi = 1.0$ / cycles	63.0 A / 3,000	
Rated voltage DC	12.0 V	
Max. switching current DC / cycles	63.0 A / 10,000	
Total bounce time	< 1 ms	
Contact resistance (according to MIL-STD. R5757)	$\leq 5 \text{ m}\Omega$	
Vibration resistance at 10 60 Hz	100 m / s ²	



Type: Normally closed; resets autor	natically	; with connecto	r cables; with epoxy; insulation: Mylar	®-Nomex®
Nominal switching temperature (NST) in 5 °C in Tolerance (standard) Reverse switch temperature (RST) below NST (defined RST is possible at the customer's request)	UL	70 °C - 180 °C ±10 K ≥ 35 °C ≥ 35 °C	Operating voltage range AC / DC Rated voltage AC Rated current AC Max. switching current AC cos $\mathbf{\Phi} = 1.0$ / cycles	up until 500.0 V
Installation height		from 8.0 mm	Max. switching current AC cos $\Phi = 1.0$ / cycles	
Diameter		18.0 mm	Rated voltage DC	
Length of the insulation cap		35.0 mm	Max. switching current DC / cycles	(
Resistance to impregnation *		suitable	High voltage resistance	
Suitable for installation in protection class		+	Total bounce time	
Pressure resistance to the switch housing *		600 N	Contact resistance (according to MIL-STD. R5757)	
Standard connection	Lead wire	1.75 mm ² / AWG14	Vibration resistance at 10 60 Hz	
Available approvals (please state)		IEC; VDE; UL; CQC	-	

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V AC / 14.0 V DC

63.0 A / 3,000

63.0 A / 10,000

250.0V

25.0 A 50.0 A / 10,000

12.0 V

2.0 kV

< 1 ms

 $\leq 5 \text{ m}\Omega$ 100 m / s²

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

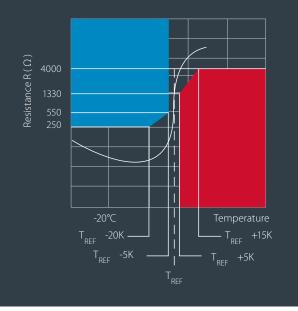
Type series PTC thermistors



Installation and functions

Where possible, the PTCs are to be inserted parallel to the coil. As a result, when shaping the coil ends, the mechanical stress of the PTCs is minimised. In so doing, the Mylar[®]-Nomex[®] shrink cap is highly suited to this purpose due to its mechanical stability (no cold flow in contrast to Teflon[®]). In connection with the miniature pill (\emptyset 1.9 mm) response times of 5 to 10 seconds (max.) are achieved depending on the version.

Thermik thermistors correspond to DIN VDE 0898-1-401:2016 and/or IEC60034-11:2004 and are characterised by high resistance to temperatures. Resistance increases greatly in the range of the rated response temperature. Via a trigger device, this change can be used to shut down the load current circuit. Electronic evaluations in are also possible in different applications.



General characteristics

Temperature resistance diagram and main parameters in accordance with DIN VDE 0898-1-401:2016 and IEC60034-11:2004

Temperature resistance diagram in accordance with IEC60034-11:2004, DIN VDE 0898-1-401:2016. Advantageous values: Rated response temperature T_{REF} 60 °C to 190 °C*, in each case in increments of 10 K.

Temperature range	Resistance	Measured voltage [V _{DC}]		
-20 °C to T _{REF} -20 K	20 Ω to 250 Ω	≤ 2,5 V		
Temperature range 90 °C - 160 °C				
T _{REF} -5 K	≤ 550 Ω	≤ 2,5 V		
T _{ref} +5 K	≥ 1.330 Ω	≤ 2,5 V		
Т _{кеғ} +15 К	≥ 4.000 Ω	≤ 7,5 V pulsed		

Dielectic strength of the insulation Ueff = 2.500 V

* These parameters relate to T_{REF} from 90 °C to 160 °C. Resistance values for T_{REF} < 90 °C and > 160 °C are available on request.



With connector cables; insula	tion Mylar®-Nome.
Insulation material	Mylar®-Nome
Response temperature	60 °C - 190
Operating voltage range	2.5 V DC - 24.0 V
max. permissible operating voltage	30.0 V
max. recommended sensor voltage	2.5 V DC - 7.5 V
High voltage resistance	2.5
Length of the insulation cap	12.0 m
Diameter	≤ 4.0 n
Available approvals (please state)	UL; C



Insulation material	PTFE
Response temperature	60 °C – 190 °C
Operating voltage range	2.5 V DC - 24.0 V DC
max. permissible operating voltage	30.0 V DC
max. recommended sensor voltage	2.5 V DC - 7.5 V DC
High voltage resistance	2.5 kV
Length of the insulation cap	12.0 mm
Diameter	≤ 2.0 mm
Available approvals (please state)	UL; CSA



With connector cables; insula	
Insulation material	PVDF (KYNAR®
Response temperature	60 °C - 190 °C
Operating voltage range	2.5 V DC - 24.0 V DC
max. permissible operating voltage	30.0 V D0
max. recommended sensor voltage	2.5V DC - 7.5V DC
High voltage resistance	2.5 k\
Length of the insulation cap	12.0 mm
Diameter	≤ 2.5 mm
Available approvals (please state)	UL; CSA

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	www.thermik.de/en/data/LTM		1:1		In: Re Op m. Hi Hi
			13,0 mm	10.0mm	Th W Av

With connector	cablecting dati	on in the core	u on houring
vviiricoririecior	CODES. INSUIGH	OHTHTESCEV	v or rigging

Insulation material	Fully insulated aluminium housing
Response temperature	60 °C – 190 °C
Operating voltage range	2.5 V DC - 24.0 V DC
max. permissible operating volta	ge 30.0 V DC
max. recommended sensor volta	ge 2.5 V DC – 7.5 V DC
High voltage resistance	2.5 kV
Housing height	8.0 mm
Thread length	M 4 / 5.0 mm
Width across flats / Max. torque	10 / 2 Nm
Available approvals (please state)	UL; CSA

k **lie**men

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

Thermistors

	With connector cables; insulat	tion Mylar®-Nomex®	XT III	With connector cables; insulat	tion Epoxy
איייאי גער דוויג גער דוי עממע איי	Insulation material	Mylar [®] -Nomex [®]		Insulation material	Ероху
	Response temperature	60 °C − 190 °C	p/u:	Response temperature	60 °C − 190 °C
- /	Operating voltage range	2.5 V DC - 24.0 V DC	de/e	Operating voltage range	2.5 V DC - 24.0 V DC
	max. permissible operating voltage	30.0 V DC	mik	max. permissible operating voltage	30.0 V DC
	max. recommended sensor voltage	2.5 V DC - 7.5 V DC	ww.thermik.de/en/data	max. recommended sensor voltage	2.5 V DC - 7.5 V DC
	High voltage resistance	2.5 kV	W	High voltage resistance	2.5 kV
\$	Length of the insulation cap	16.0 mm	_ ≥	Length of the crimp cable lug	max. 20.0 mm
	Diameter	≤ 4.0 mm		Diameter	≤ 8.0 mm
	Available approvals (please state)	UL; CSA		Available approvals (please state)	UL; CSA
			8.0 mm		

PTC thermistors

Thermik* PTC thermistors are used for temperature monitoring. They are optimally designed for direct installation into the windings of electric motors and transformers. When employed with compatible circuitry (electronic assemblies, heat sinks, etc.), Thermik PTC thermistors prevent overheating of the devices in which they are installed. We offer a selection of insulation sleeves, encasements and fastener-mountings to fit your specific application.

Thermik is one of the few suppliers of PTC thermistors who have the depth and knowledge of materials from specific experience in the manufacture of PTC ceramics, having invested extensively in this technology. Thermik PTC thermistors are engineered to be superior.

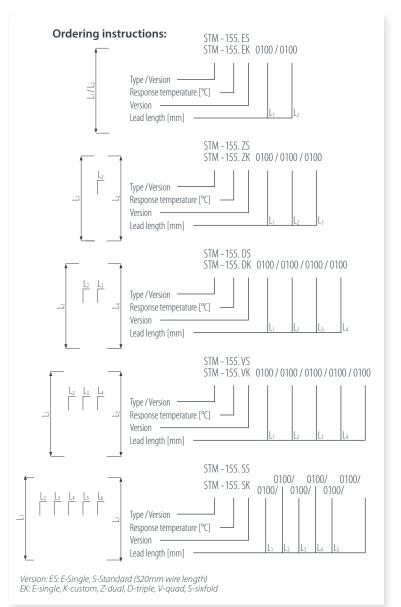
Customised designs

Design K - customised – variations/additions possible upon request:

- Colour coding
- Cable insulation material or cable cross-section
- Cable-end assembly
- Connection technology
- Components used with UL-cable
- Dielectric strength of the insulation (e.g. suitable for installation in Class II applications)

Advantages

- Small dimensions + mechanical stability
- Fast response
- Temperature-resistance characteristics tailored to the application in question



Colour-coding dependent on temperature according to DIN VDE V0898-1-401:2016 and IEC60034-11:2004

60	70	80	90	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	180	190
white	white	white	green	red	blue	brown	blue	grey	red	blue	red	white	white	black	blue	blue	blue	white	white	black
grey	brown	white	green	red	grey	brown	green	grey	green	blue	brown	blue	black	black	black	red	brown	green	red	brown

* normal trade description including motor protection sensors, PTC thermistors, PTC sensors, PTCs, temperature sensors, etc.

Customised solutions

Thermik has been the direct development supplier and innovation partner for numerous high-profile market leaders for decades now. It is no surprise therefore that Thermik also has the world's largest range of customer-centric solutions for thermal protector applications in structural components.



Thermik[®]



Thermik in international markets

Production plants and agencies around the world

Thermik runs an internationally oriented system of production and logistics. Four plants with over 17,000 square metres of production area and over 20 contracted warehouse distributors worldwide ensure the constant availability of our branded items. **Thermik products are cheapest when purchased directly from Thermik**. Expert product advice is available if required (all customer advisers are graduate engineers) in all the main languages used in international business. In addition, however, there is also the option of purchasing our products through a network of distribution centres from our authorised agents. **Professional advice and excellent logistics – this is to which Thermik also attaches great importance!**



Thermik headquarters, Thuringia (Germany)

International agencies:

Thermik Corp. New Be

Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Iran, Ireland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Macedonia, Morocco, Netherlands, Norway, Poland, Romania, Russia, Slovakia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United States

hermik Logistikzentrum/

Thermik Technologies sdn., Malavsia





Thermik in international markets

Many of our partners purchase Thermik products directly from stock. Whether it's via us or our international agents: it is the customer himself who decides. Similarly, the extent to which the customer wishes to be supported by one of our local representatives, by ourselves or by both, is also his choice. It is important for us that can experience our customer support and service at any time and at any location you want. Through our agencies – **or through us directly** – you can get your stock from on-demand warehouses locally in numerous countries:



www.sibel.bg



www.synflex.com



www.energel.com



www.mgr.co.il



www.miottisrl.com



www.greenway-ltd.co.uk







www.dacpol.eu



www.elsensor.ru



www.bevi.se



www.schupp.ch



www.nou-elec.com



www.code-tech.co.za



www.pzk.cz



www.emtel.com.tr



www.e4.hu

Thermik innovation

Research & development

Thermik has patented more inventions in the past two decades and created more new products / developments / features than all thermal protection competitors combined. According to the latest Plimsoll Analysis*, Thermik is the only competitor displaying potential for future growth. Here's the reason why: We lead the industry with innovation. There is no supplier in the world with a quantitatively or qualitatively greater product range as standard, nor with more customer-specific solutions.

For the past 45 years, this continuous accomplishment has been achieved not as a goal, but as a result of our partnership model. Our endeavor to meet each customer's unique needs has been the primary driver for our new technology and new product developments. Opportunities and solutions previously unimaginable have been realized and commercialized by Thermik, for our customers.

- The round thermal protector
- The flat thermal protector
- The pressure resistant thermal protector
- The airtight thermal protector
- The current-independent thermal protector
- The temperature-sensitive thermal protector
- The defined current sensitive thermal protector
- The voltage-retaining thermal protector
- The interlocking insulation shrink cap
- The thermal protector on the band
- The high-temperature thermal protector
- The high-performance thermal protector
- The hybrid thermal protector
- The arc-free thermal protector
- More and more...

Leadership in innovation also means superior IP management. We are the only one of the six leading manufacturers of thermal protectors to show position and potential in the Thermik patents granted for inventions and innovations.

Our patented "snap-action" spring disc mechanism is only one of the engineering innovations that sets Thermik's apart from other thermal protector designs. Continuing the legacy begun by our founder, Peter Hofsaess, who first solved the fundamental issue of electrical current self-heating in bimetallic switches, Thermik engineers have created solutions in applications across industries. including drive technology, refrigeration, wind technology, pumping, space travel, automotive, motion control, material handling, production machinery, heaters, transformers, and of course, motors. We anticipate many, many more yet to be added to our list of contributions to the industry.



Thanks to Thermik's longterm continuity (over 15 years of market leadership) in the technological and innovative aspects of thermal protectors, we were given the Top 100 award for being one of the "100 most innovative MSEs in Germany" for the 10th time in a row.





Source: DPMA IP-register, categories H01, date 2019-02-11, IP-register Hofsaess-Holding date 2019-02-11



Thermik quality

Quality management

Creativity without quality is nothing. But quality always requires creativity. Leading with innovation means tried and tested methods exist to be improved. Through constructive comparison with existing products and processes, and by embracing customer's continuous requests to create new and better thermal protectors for new applications, Thermik has become an innovation leader, pioneering ideas for modern yet sustainable solutions.

Creating new products that solve new problems inevitably encourages and supports continuous improvement in all areas of manufacturing and quality assurance. Designs improve, processes improve, products improve. Rather literally, Thermik's quality driver is continuous improvement. Quality is "built-in" to everything we do. Not surprisingly, Thermik was the first thermal protector manufacturer to be certified under ISO 9001.

Many production process, tests, and QA methods are continuously refined, including thermo-selection processes, fully automatic resistance-testing, and automated thermal selection





machines. Any new processes are established and documented, and we will only begin production following 100% positive testing and quality assurance results.

Thermik's temperature "calibration" is accomplished by 100% test-and-sort (T&S) temperature selections. We don't calibrate the temperature at the end of production by mechanical adjustment. Like our quality mandate, it is "built-in" from the beginning. Two T&S selections and multiple QA audits are performed to confirm temperature. Only after the final QA audit do we certify that the required switch temperature performance is BUILT-IN. Switch sub-assemblies are then individually laser etched with the temperature rating and lot number, making identification and trace-ability possible even decades later. Only Thermik products have this guarantee – a competitive feature for our customers, too. Finally, after certification of each assembled switch, we make each final thermal protector to customer specification with lead wires, switch insulation, additional attachments, etc.

Last but not least, all these achievements would not be possible without the people behind them. For Thermik, quality is a culture, and our people build it in.
Not everyone needs quality, but
quality needs evenues and the second seco

Not everyone needs quality, but quality needs everyone to be involved. Therefore, all Thermik employees are considered to be quality employees.

"Trust is also an investment. Fulfilling someone's trust means profit!" Marcel Hofsaess, CEO

Winners and partners who rely on Thermik:



Wherever innovative solutions and greater safety are sought, Thermik is the trusted partner.

The most recent awards and an explanation of them:



Once a year, Germany's hundred most innovative SMEs are determined by leading economists and entrepreneurs. This involves looking at patents and innovation management in great detail, amongst other things. The basic requirement is not only technical leadership in the sector, but also a competitive advantage spanning several years. Thermik is one of only 4 companies that have received this award 10th times in a row.



Germany's leading accounting firm regularly nominates the 75 most efficient SMEs for its ,Entrepreneur of the Year' award. Only companies who are leaders in their sector, who display good continuity, growth and economic success and who are better positioned than their competitors receive such nominations and awards.







Prize for being the 'Best of the best' of around 4000 worldwide market segments. Only those German companies that are global leaders in their respective market segments make it into the 'Encyclopedia of World Market Leaders'.

'Querdenker' (English: 'lateral thinkers') are deemed to be those entrepreneurs who 'have achieved outstanding successes – as extraordinary rule-breakers and motivators, as pioneers or role models – through interdisciplinary thinking and action and who have been prepared to leave the trodden paths and take new ones, with passion and courage.'

This award is regularly given to companies belonging to the top 1.7% of all German companies in terms of the best longterm credit rating.

52 **Demik**



List of abbreviations

А	Ampere
°C	degrees celcius
AC	alternating current
AWG	American Wire Gauge
CEO	Chief Executive Officer
CMJ	Council for Electrical & Electronic Components
	and Materials of Japan
сN	Centinewton
cos φ	power factor
CQC	China Quality Certification Center
CSA	Canadian Standards Association
d	diameter
DC	direct current
DIN	German Institute for Standardization
DPMA	German Patent and Trademark Office (GPTO)
EN	European standards
ENEC	European Norms Electrical Certification
GB	Guobio, Chinese for "national standard"
H01	International patent classification, sector
	electrical engineering
Hz	Hertz
IEC	International Electrotechnical Commission
IECEE	International Commission on the Rules for the
	Approval of Electrical Equipment
JET	Japan Electrical Safety & Environment
	Technology Laboratories
К	Kelvin

kV	Kilovolt
m/s ²	meters per square second
M4 / M6	Class of metric ISO threads
	(general application of coarse threads)
mA	Milliampere
MIL-STD. R5757	Specifications for the American Defense
	Standard
mm	Millimeter
mm ²	square millimeters
ms	Millisecond
mΩ	Milliohm
Ν	Newton
Nm	Newtonmeter
NST	rated switching temperature
PTC	Positive Temperature Coefficient
PTFE	Polytetrafluorethylen (also known as Teflon)
PVDF	Polyvinylidenfluoride (KYNAR®)
REACH	EU chemical regulations
RoHS	EU directive on the restriction of the use of
	certain hazardous substances in electrical and
	electronic equipment
RST	reset temperature
UL	Underwriters Laboratories
V	Volt
VDE	Association for Electrical Technology
μm	Micrometer
Ω	Ohm

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