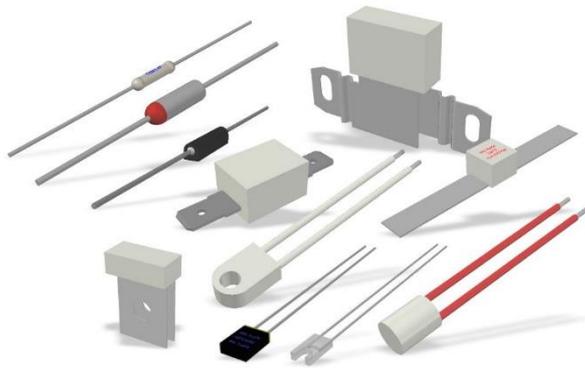






## Temperature Protection



### Thermal Fuses

Thermal fuses or thermal cutoffs are used for the safe and **one-time shutdown** (disconnection) of circuits.

They usually consist of a fused alloy, flux, a plastic, ceramic or metal housing, epoxy resin and connecting wires.

When the rated switching temperature is reached, the alloy melts between the two connecting wires and completely disconnects the circuit.

The different types of thermal fuses offered by us provide flexible application possibilities in electronic and electro technical applications.

### Characteristics

- High accuracies of the switching temperature
- Switching temperatures from 50°C to 280°C
- Current load up to 200A
- Voltages up to AC 800V and DC 450V
- Customized design

### Applications

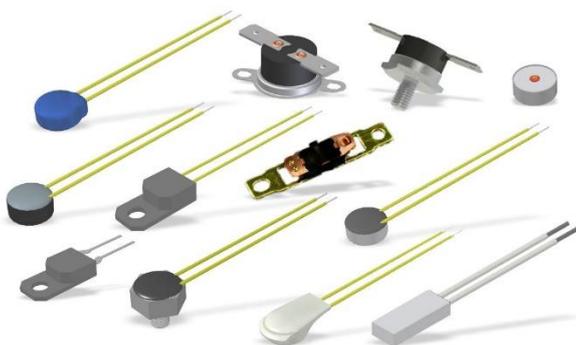
- Transformers
- Power Equipment
- Electric Heaters
- Electric Motors
- Storage Systems



[Link to the Website](#)



## Temperature Protection



### Thermal Protectors

Temperature switches, temperature limiters or thermal switches are used for safe and **repeated** opening or closing of circuits.

They usually consist of a bimetal, a spring washer, a plastic, ceramic or metal housing and strands, wires or plugs.

When the nominal switching temperature is reached, the bimetal disc snaps into its reverse position. This opens or closes the contact system and thus interrupts or contacts the electrical circuit. After reaching the reset temperature, the contact system drops back to its original state.

### Characteristics

- High accuracies of the switching temperature
- Switching temperatures from -45°C to 425°C
- Current load up to 30A
- Voltages up to AC 250 and DC 48V
- Up to 10,000,000 mechanical cycles

### Applications

- Transformers
- Power Equipment
- Electric Heaters
- Electric Motors
- Storage Systems



[Link to the Website](#)



## Temperature Protection



### Disc Thermal Switches

Alpha Therm's Disc Thermal Switches cover a wide temperature range from -45°C to +425°C and are manufactured to customer specifications in one of more than 25,000 different designs.

The components can reach  $\geq 100,000$  switching cycles.

Depending on the specification, the components can be used as temperature limiter, controller or fuse with automatic or manual reset. They have plastic or ceramic housings and flat, solder or stranded connections.

The half-inch switches have a variety of mounting options such as screw-on or screw-in heads, clamp connections for pipes and many more.

### Characteristics

- -45°C...+425°C
- Switching capacities of AC 250V 10A...16A
- $\geq 100,000$  switching cycles
- Over 25,000 customer-specific designs
- plastic or ceramic housing

### Applications

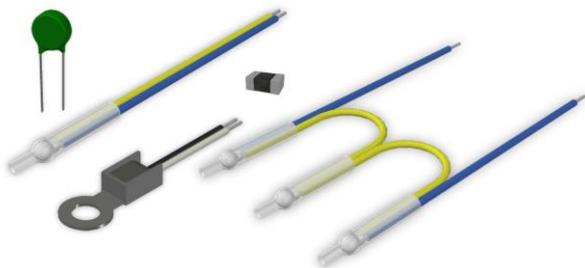
- Air Conditioning Systems
- Heating Control
- Heater
- Storage Systems
- Temperature control in switch cabinets



[Link to the Website](#)



## Temperature Protection



### PTC Limit Temp. Sensors

Limit temperature sensors, motor protection sensors or PTC thermistors, are mainly used for monitoring tasks.

A major application here is the thermal monitoring of motors, generators or transformers.

As a result of the sudden characteristics characteristic, which equals a switching behavior, PTC thermistors are not suitable for measurement tasks, but are used to signal an over temperature or to interrupt the power supply at a precisely defined reference temperature.

The different types of limit temperature sensors we offer provides flexible application possibilities in electronic and electro technical applications.

### Characteristics

- High accuracies of the reference temperature
- Response temperatures of +55°C...+180°C
- Thermal response times  $\leq 5s$
- Customized design
- With pigtailed, wires or SMD

### Applications

- Transformers
- Electric Motors
- Generators
- PCBs
- Direct use in windings



[Link to the Website](#)



## Temperature Controlling



### Bimetallic Thermostats

High-performance control thermostats are precision control bimetal thermostats that have been designed and manufactured with great emphasis on miniaturization and low cost.

They are particularly well suited for applications in which only a limited space is available and make extensive control electronics superfluous.

Long life of up to 10 million mechanical cycles and high accuracy at comparatively low prices are the strengths of the bimetallic temperature controller.

#### Characteristics

- Switching point tolerances of  $\pm 1.5K$  are possible
- Switching temperatures from  $-10^{\circ}C$  to  $380^{\circ}C$
- Voltages up to AC 250 and DC 24V
- Customized design
- Up to 10,000,000 mechanical operations

#### Applications

- Antifreeze
- Fan Control
- Heating Control
- Exterior Cameras
- Heating Mats & Foils



[Link to the Website](#)



## Temperature Controlling



### Temp.- & Humidity Controllers

The controllers we offer are as temperature controllers, humidity controllers & as combination units for temperature & humidity control available in one unit.

They are particularly well suited for heating & cooling applications, fan control, multi-stage control tasks and much more.

For most models, the corresponding sensors are included as a matter of course.

A large selection of different controllers with high quality at comparatively low prices characterize our electronic controllers.

#### Characteristics

- Easy handling
- Temperature control from  $-200^{\circ}C$  to  $1,200^{\circ}C$
- Humidity control from 0%...100% RH
- Voltages up to AC 250 and DC 24V
- Combination devices for temperature & humidity

#### Applications

- Air Conditioning Systems
- Heating Control
- Storage Systems
- Multi-level control tasks
- Panel Controller



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## Temperature Controlling



### Adjustable Bimetal Thermostats

TKP Series adjustable bimetal temperature controllers are reliable and durable controllers with tight tolerances and wide operating temperature range -45°C to + 250°C.

The specification and design of the TKP series can be freely selected.

Due to the comparatively small designs, they are space-saving and cost-effective alternatives to electronic temperature controllers.

They are suitable for a variety of electrical heating and cooling applications.

Current and temperature sensitive versions are also available.

#### Characteristics

- Switching capacity AC 250V / 10A...16A
- More than 100,000 switching cycles
- Control range from 60°C to 225°C
- Switching tolerances of  $\pm 3K... \pm 10K$
- Normally Closed or Normally Open

#### Applications

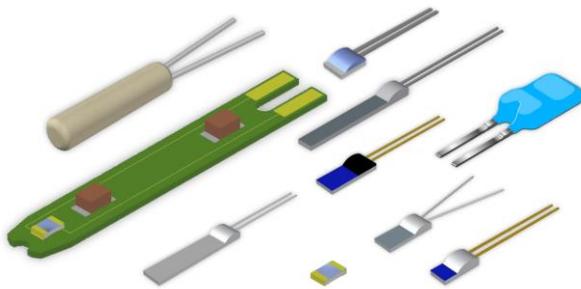
- Fan Control
- Heating Control
- Heater
- Tubular radiator
- Iron



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## Temperature Sensors



### Platinum RTDs

Platinum resistance temperature detectors are based on a temperature-dependent platinum resistor, the course and permissible tolerance of which are defined in the international standard DIN EN 60751.

In thin-film design, they combine the favorable properties of a platinum temperature sensor with the advantages of high-volume production. They are characterized by standardization and universal interchangeability, as well as by high measuring accuracy, excellent long-term stability and good reproducibility of the electrical properties. Therefore, platinum chip temperature sensors are also a real alternative to semiconductor based thermistors.

#### Characteristics

- Operating temp. range from -200°C to 800°C
- Over 300 different models
- Double Pt100 available
- Pt100, Pt500, Pt1.000, Pt2.000 are available
- Connecting wires are made of palladium, gold, platinum, silver, nickel or are pre-tinned

#### Applications

- Winding Sensors
- Cable Probes
- Screw-in Probes
- Surface Probes
- Sheath Resistance thermometers



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## Temperature Sensors



### NTC Thermistors

Thermistors have a negative temperature coefficient (TK) and are therefore often called NTC thermistors (NTC = Negative Temperature Coefficient).

They consist of mixtures of ceramic materials which determine their properties depending on the composition.

Resistance values from a few ohms to a few mega ohms and wide operating temperature ranges of -50°C...350°C are possible.

If the ambient temperature of the thermistor changes, the resistance decreases.

This behavior can be used, for example, for purposes of temperature detection or temperature compensation.

### Characteristics

- Few ohms to a few mega ohms
- Operating temperature range from -55°C to 350°C
- SMD or THT designs
- High accuracies of up to ±0.1K
- Pre-assembled versions available

### Applications

- Temperature measurement
- Temperature compensation
- Sensor production
- Sheath resistance thermometers
- Automotive industry



[Link to the Website](#)



## Temperature Sensors



### KTY & possible Alternatives

KTY are temperature sensors made of doped silicon with a positive temperature coefficient.

Similar to platinum measuring resistors, they have an approximately linear characteristic curve.

They are long-term stable and a cost-effective solution for temperature measurement up to 150°C.

As a possible replacement for the discontinued KTY83 & KTY84 from NXP, we offer the PTC-600 and the PTC-1000 series, which have almost identical values as the discontinued KTY83 and KTY84.

In many cases, the discontinued components can be replaced quickly and easily, without extensive adjustment of the transmitter.

### Characteristics

- Replaces KTY83 and KTY84
- Operating temperature range from -55°C to 150°C
- SMD or THT designs
- High accuracies of up to ±0.1K
- Pre-assembled versions available

### Applications

- Temperature measurement
- Temperature compensation
- Sensor production
- Sheath resistance thermometers
- Automotive industry



[Link to the Website](#)



## Temperature Sensors



### Temperature Sensors

Alpha Therm sensors include a wide range of standard solutions. Zusammen mit Ihnen optimieren wir diese Standardlösungen für Ihre Anwendung. Together with you we optimize these standard solutions for your application. By default, our temperature sensors are available with all the sensor elements we offer. Some of our temperature sensors are also UL, cUL and VDE approved. Further information is available on request.

#### Characteristics

- Customized designs
- With NTC, PTC, KTY, Pt100, Pt1000, ...
- High accuracy
- Short response times
- Direct use in liquids is possible

#### Applications

- Heating Application
- Cooling Technology
- Power supply
- Motor temperature sensor
- Food industry



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## Overload Protection



### NTC Inrush Current Limiters

For a circuit that includes a capacitor, filament, heater, or fluorescent lamp ballast, the inrush current can be 10 ~ 100 times higher than normal operation. This can be avoided by using an NTC thermistor which is connected in series. The greater cold resistance (zero power resistance) of the thermistor thereby limits the inrush current when switched on. After switching on, the flowing current leads to a self-heating of the thermistor, whereupon this reduces its resistance value to a very low ohm value, thereby enabling a normal operating current.

#### Characteristics

- Cold resistance of R25: 0.7Ω...120Ω
- Diameter of Ø5mm...Ø30mm
- Capacity at AC 240V / 68μF...1500μF
- Operating temperatures from -40°C...+200°C
- RoHS compliant and halogen free

#### Applications

- Switching Power Supplies
- Electric motors
- Transformers
- Projectors
- LED driver circuits



[Link to the Website](#)



## Overload Protection



### PTC Thermistors

PTCs have a positive temperature coefficient (TC) and are therefore often called PTC thermistors (PTC = Positive Temperature Coefficient). Their resistance increases with increasing temperature. They consist of doped ceramic materials based on barium titanate. If current flows through the PTC thermistor, it heats up. This increases his resistance. This behavior can be exploited inter alia for purposes of overcurrent limiting and time delay. Further areas of application: Switching on short-term current pulses (e.g. for demagnetizing color picture tubes or for starting induction motors) and use as a heat source (heating element).

#### Characteristics

- THT, SMD and disc designs
- Nominal voltage AC 12V...1.000V
- Long-term stability
- Wide operating temperature range
- Customized adjustments on request

#### Applications

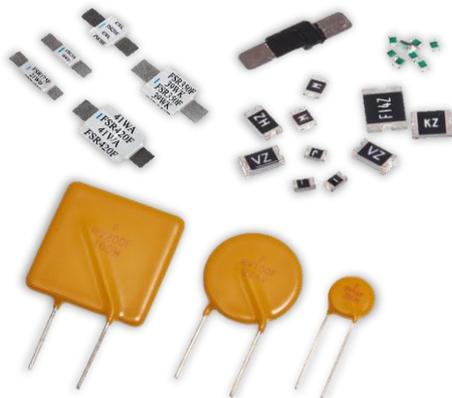
- Inrush
- Lighting Applications
- Overload protection
- Telecom Applications
- Heating elements



[Link to the Website](#)



## Overload Protection



### Polymeric PTC Thermistors

The PPTCs are known under the trade names PolySwitch or Multifuse. Here, PPTC stands for the English term Polymeric Positive Temperature Coefficient.

For **multiple**, demanding circuit overcurrent protection, PPTCs are the perfect solution.

If the maximum permissible current is exceeded, the PPTC heats up and becomes very high-ohmic in a very short time, whereby the current is throttled far below the normal current.

In contrast to conventional current fuses, the polymer PTC falls back to its original state after cooling.

Due to their properties, polymer PTCs are an inexpensive solution for short-circuit protection and overload protection applications.

#### Characteristics

- THT, SMD and disc designs
- Automatic reset
- Short reaction times
- Operating voltages of up to AC / DC 240V
- Maximum currents of up to 100A

#### Applications

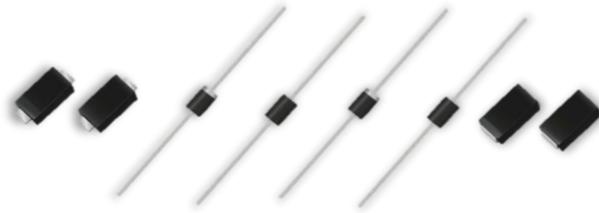
- Telecom Applications
- Network applications
- PCB protection
- Accumulators
- Motor protection



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## Over Voltage Protection



### Suppressor Diodes

Suppressor diodes, or transient voltage suppressor diodes (TVS diode), are used to protect electronic circuits from voltage pulses. By switching operations or near lightning strikes can briefly generate voltages that are sufficient to destroy semiconductor devices in the circuit. Suppressor diodes become conductive when their breakdown voltage is exceeded.

By parallel connection to a component to be protected, the pulse is dissipated, so that no destructive voltage can build up. In this case, this behaves ideally perfectly neutral, in particular by low leakage current and capacity outside an overvoltage event.

### Characteristics

- THT & SMD types
- Reliable surge protection
- Short reaction times
- Operating voltages of up to AC / DC 240V
- Maximum currents of up to 100A

### Applications

- Telecom Applications
- PCB protection
- Consumer Electronics
- Industrial applications



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## Over Voltage Protection



### Metal-Oxide-Varistors

Metal Oxide Varistors (MOV) or VDR (Voltage-Dependent Resistor) are protective components whose resistance value is voltage-dependent. Because of their properties, they are often used to protect against voltage surges in electronic circuits.

Above a certain threshold voltage, the resistance drops abruptly. For Varistors that work frequently, it makes sense to additionally attach a thermal fuse, as they can become high-ohmic and hot over time, which can cause damage to the device.

### Characteristics

- THT, SMD & block designs
- Max. Voltages up to DC 1.465V / AC 1.000V
- Excellent dissipation behavior
- Operating temperature range from -40°C to +150°C
- Thermally protected MOV are available

### Applications

- Power Equipment
- Telecom Applications
- Light Applications
- Photovoltaic systems
- LED driver



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## Over Voltage Protection



### Gas Discharge Tubes

Gas Discharge Tubes (GDT) consist of a spark gap enclosed in a sealed ceramic or glass tube filled with inert gas. Under normal conditions, the operating voltage does not reach the sparkover voltage and the GDT maintains its high resistance. As soon as the voltage applied to the arrester exceeds the ignition voltage, an arc is formed within nanoseconds in the gas-tight discharge space. When the interference has subsided, the arrester extinguishes and the internal resistance resumes its original operating state with several 100MΩ.

#### Characteristics

- THT, SMD & Disc designs
- Leakage currents up to 160.000A
- Response voltages up to DC 6,000V
- Excellent dissipation behavior
- High quiescent resistance of several 100 MΩ

#### Applications

- Power supplies
- Industrial applications
- Telecom Applications
- Data transfer
- Network applications



[Link to the Website](#)



## Buttons & Switches



### Buttons & Switches

Among the switches and push buttons we offer countless different types and models.

Toggle switches, rocker switches, slide switches, push buttons, push buttons, DIP switches, tactile switches, rotary switches, emergency switches and many others are available.

Furthermore, we also offer matching accessories to the switches & buttons such. Rubber hoods, washers or locknuts.

#### Characteristics

- THT, SMD types
- High switching cycle numbers
- Customized designs
- With & without LED lighting
- Gold contacts for smallest currents are available

#### Applications

- Data transfer
- Network applications
- Audio Technology
- Modelling
- Switchboard



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