

Limit-value switch for temperature, input NiCr-Ni-type K thermocouple



RTK5..

Limit-value switches

- Straightforward application
- Suitable for severe operating conditions
- Compact construction
- Limit value freely adjustable by drum scale
- Anti-tamper seal for drum scale
- Meet high EMC-requirements
-  requirements
- Volt-free output as change over switch contact
- Open-circuit or closed-circuit variants available
- Reference junction for temperature compensation integrated
- Broken-wire monitoring for input signal
- Operating characteristics displayed by integrated LEDs
- Flame-inhibiting and self-extinguishing body
- Suitable thermocouples are available

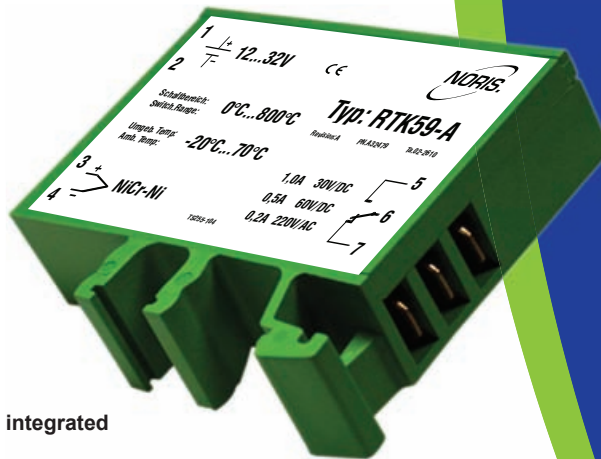


Image
RTK59-A



Germanischer Lloyd

Limit-value switches of series 5

Limit value switches of the series 5 are designed to monitor and process electric measured variables.

Working principle: When the actual value of the measuring signal supplied reaches the setpoint, the built-in relay will operate. The switching status of the relay contact may, for instance, be monitored or individually processed by a machine controller.

General notes on Type RTK5..

Description RTK5..

The Type RTK5.. is designed for the temperature monitoring with NiCr-Ni-type K thermocouples according to EN60584-1. The difference is evaluated between an mV-voltage at the tip of the thermocouple and that at the end of the compensating line at the limit-value switch. A correction by the temperature at the limit-value switch applied by an integral reference junction provides information on the temperature at the thermocouple tip. No external reference sensor is required. For satisfactory working of the device, it is necessary that the compensating line be extended to the limit-value switch. Settings of the limit value are made at the short top side of the device by means of a drum scale. The scale is graduated in degrees Celsius to suit the specific measuring range. Any value on the drum scale can be selected as the limit value.

Monitoring sensor integrity

The RTK5.. type series comes equipped with broken-wire monitoring. If either or both wires to the thermocouple should be broken, the relay output will operate, the red LED will light up, and the green LED will be flashing.

Volt-free relay contact, closed-circuit or open-circuit version

A volt-free relay contact is provided as a change over switch contact for outputting and further processing. In addition, there is a choice between closed-circuit and open-circuit devices.

In the case of closed-circuit devices, the output relay is pulled up in the normal state of operation with the supply voltage applied. It drops off upon the limit-value being exceeded or if the supply voltage fails.

In the open-circuit variant, the output relay pulls up when the limit-value is exceeded with the supply voltage applied. Failure of the voltage will not result in any switching function below the limit value.

Technical Data

| Series RTK5.. | |
|------------------------------|--|
| Supply voltage | $U_s = 9 \dots 32 \text{ V/DC}$; $U_R = 24 \text{ V/DC}$ |
| Ripple | $< 20\% U_s$ |
| Reverse voltage protection | Integrated |
| Overvoltage | 2.5 times U_R up to 2 ms |
| Voltage drops | 100% up to 10 ms |
| Power consumption | Approx. 50 mA (24 V/DC) |
| Galvanic isolation | Between input signal and supply voltage |
| Input signal | Thermocouple NiCr-Ni typ K according to EN60584-1 |
| Output contact | Volt-free change over switch contact, closed circuit or open circuit |
| Maximal switching capacity | 30 W (1 A at 30 V/DC; 0.5 A at 60 V/DC) 40 W (0.2 A at 220 V/AC) |
| Limit value | Adjustable on tamper-proof drum scale between 0 ... 600 °C for RTK58.., 0 ... 800 °C for RTK59.. |
| Reproducibility | $< \pm 0.2\%$ |
| Linearity of scale | $< \pm 1.5\%$ |
| Hysteresis | Approx. 1.5% |
| Sensor monitoring | Broken-wire RTK58.. at 33,28 mV (800 °C), RTK59.. at 41,27 mV (1000 °C) |
| Error class | IEC51-1 1.5% |
| Temperature sensitivity | $< \pm 0.1\% \text{ je } 10 \text{ }^\circ\text{K}$ |
| Voltage sensitivity | $< \pm 0.1\%$ for 10% change in supply voltage |
| Measuring suppression | Approx. 2 s after turning on the supply voltage |
| Vibration resistance | IEC60068-T2-6 15g increased strain, characteristic 2 (10 ... 100 Hz) |
| Shock resistance (impact) | DIN IEC60068-T2-27 300 m/s ² with 18 ms dwell time |
| Climatic test | IEC60068-T2-30 |
| Operating temperature | -20 °C ... +70 °C |
| Storage temperature | -45 °C ... +85 °C |
| Humidity | RH 96% maximum |
| ESD | IEC61000-4-2 $\pm 8 \text{ kV}$ |
| Electromagnetic field | IEC61000-4-3 10 V/m f=10 kHz ... 2000 MHz, 80% AM @ 1 kHz 10 V/m f=900 \pm 5 MHz, 50% AM @ 200 Hz 10 V/m f=1800 MHz \pm 5 MHz, 50% AM @ 200 Hz |
| Burst | IEC61000-4-4 $\pm 2 \text{ kV}$ supply $\pm 1 \text{ kV}$ sensor |
| Surge | IEC61000-4-5 sym. $\pm 1 \text{ kV}$ ($R_f=2 \text{ }\Omega$) asym. $\pm 2 \text{ kV}$ ($R_f=2 \text{ }\Omega$) |
| HF-susceptibility | IEC61000-4-6 3 V _{pp} 80% AM @ 1 kHz f=0.01 ... 100 MHz |
| LF-susceptibility | IEC60553 3 V _{pp} 0.05 ... 10 kHz |
| Interference field intensity | Basis CISPR 16-1, 16-2 reduced characteristic |
| Connection | DIN46244 flat connector, gold-plated A6.3 x 0.8 |
| Protection class | DIN EN60529 Body IP20, terminals IP00 |
| Mounting | Snap-fit on top-hat channel or G-channel |
| Installed position | Any |
| Body material | Thermoplastic polyester, green, fire protection class V0 |
| Weight | 55 g |
| Applied standards | CE requirements complied with, DIN EN 61000-6-2, DIN EN 61000-6-4, DIN EN 50155, approved by GL, BV, LR, DNV |

Type key / variants

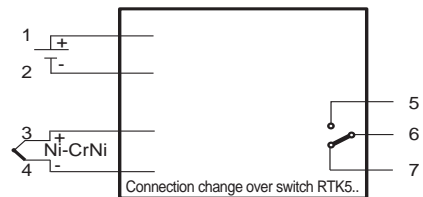
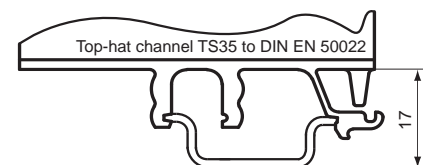
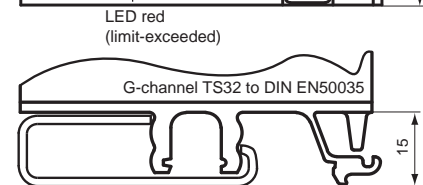
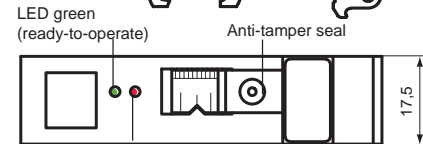
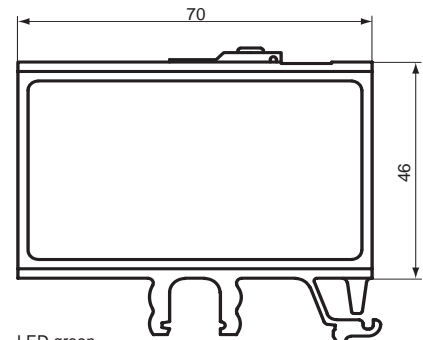
| Input range: | 0 ... 600 °C | 0 ... 800 °C |
|--|--------------|--------------|
| Change over switch in closed current | RTK58 | RTK59 |
| Change over switch in open-circuit current | RTK58-A | RTK59-A |

Device codes

| | |
|----|--|
| R | Limit-value switch |
| TK | Input signal Thermocouple NiCr-Ni Typ K |
| 5 | Type series Type 5 |
| 8 | Input range 0 ... 600 °C = 0 ... 24,902 mV |
| 9 | Input range 0 ... 800 °C = 0 ... 33,277 mV |
| A | Variants Output contact as change over switch contact in closed current |
| - | Variants Output contact as change over switch contact in open-circuit current |

R TK 5 8 (RTK58) order example

Other Data



Relay position

| | RTK5..-A | RTK5..-A | RTK5.. | RTK5.. |
|------------------------------|----------|----------|--------|--------|
| Terminal | 6/7 | 5/6 | 6/7 | 5/6 |
| U < limit value | x | - | - | x |
| U > limit value | - | x | x | - |
| Broken-wire in sensor circle | - | x | x | - |

x = contact closed

- = contact open

The red LED is illuminated, if the limit value is exceeded



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