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

- Straightforward application
- Suitable for severe operating conditions
- Compact construction
- Switching point freely adjustable by drum scale
- Anti-tamper seal for drum scale
- Meet high EMC-requirements
  - CE requirements
- Volt-free output as make-and-break 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
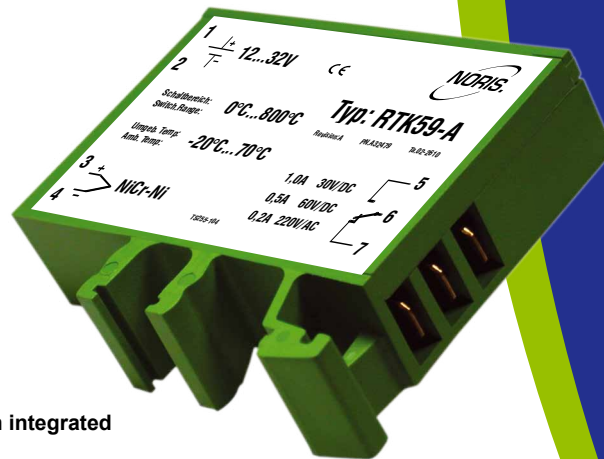- Suitable thermocouples are available

Image
RTK59-A

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 switching point 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 switching point.

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 make-and-break 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 operating voltage applied. It drops off upon the limit-value being exceeded or if the operating voltage fails.

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

Technical Data

Series RTK5..

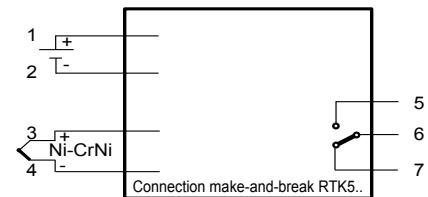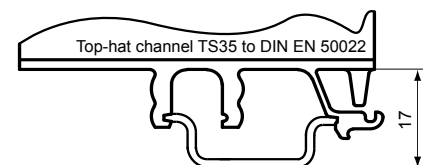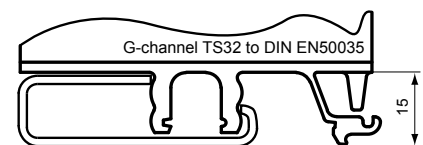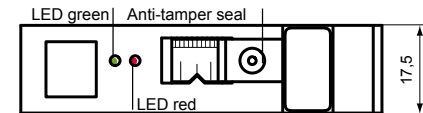|	
Operating voltage	U_O= 12 ... 32 V/DC, U_R= 24 V/DC
Ripple	< 20% U_O
Reverse voltage protection	Integrated
Overvoltage	2.5 times U_R up to 2 ms
Voltage drops	100% up to 10 ms
Power consumption	Approx. 50 mA (24 V/DC)
Galvanic isolation	Between input signal and operating voltage
Input signal	Thermocouple NiCr-Ni typ K according to EN60584-1
Output contact	Volt-free make-and-break 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)
Switching point	Adjustable on tamper-proof drum scale between 0 ... 600 °C for RTK58.., 0 ... 800 °C for RTK59..
Reproducibility	< +/- 0.2%
Linearity of scale	< +/- 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	< +/- 0.1% je 10 °K
Voltage sensitivity	< +/- 0.1% for 10% change in operating voltage
Measuring suppression	Approx. 2 s after turning on the operating voltage
Vibration resistance	IEC60068-T2-6 15g increased strain, characteristic 2 (10 …100 Hz)
Shock resistance (impact)	DIN IEC60068-T2-27 300 m/s² with 18 ms dwell time
Climatic test	IEC60068-T2-30
Operating temperature	-20 °C ... +70 °C
Shelf temperature	-45 °C ... +85 °C
Humidity	RH 96% maximum
ESD	IEC61000-4-2 +/- 8 kV
Electromagnetic field	IEC61000-4-3 10 V/m f=10 kHz ... 2000 MHz, 80% AM @ 1 kHz 10 V/m f=900 +/- 5 MHz, 50% AM @ 200 Hz 10 V/m f=1800 MHz +/- 5 MHz, 50% AM @ 200 Hz
Burst	IEC61000-4-4 +/- 2 kV supply +/- 1 kV sensor
Surge	IEC61000-4-5 sym. +/- 1 kV (R_i=2 Ω) asym. +/- 2 KV (R_i=2 Ω)
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
Standard supply	CE requirements complied with, DIN EN 61000-6-2, DIN EN 61000-6-4, DIN EN 50155, approved by GL, LR, DNV

Type key / variants

Input range:	0 ... 600 °C	0 ... 800 °C
Make-and-break in closed circuit	RTK58	RTK59
Make-and-break in open circuit	RTK58-A	RTK59-A

Device codes

R	Limit-value switch

Input signal

TK	Thermocouple NiCr-Ni Typ K

Type series

5	Type 5

Input range

8	0 ... 600 °C = 0 ... 24,902 mV
9	0 ... 800 °C = 0 ... 33,277 mV

Variants

	Output contact as make-and-break contact in closed circuit
- A	Output contact as make-and-break contact in open circuit

R TK 5 8 (RTK58)

Other Data

70 / 46

LED green | Anti-tamper seal | LED red

17,5

G-channel TS32 to DIN EN50035

15

Top-hat channel TS35 to DIN EN 50022

17

1 +
2 -
3 +
4 -
Ni-CrNi

5
6
7

Connection make-and-break RTK5..
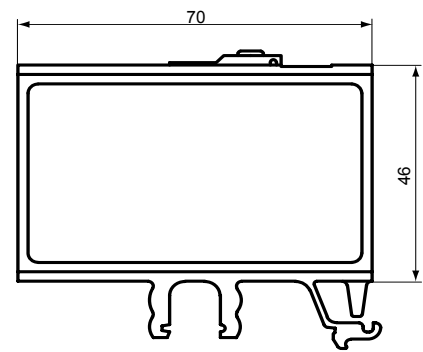
Relais position and LED code

	6/7 RTK5..-A	5/6 RTK5..-A	6/7 RTK5..	5/6 RTK5..	LED grün	LED rot
U < switch point	x	-	-	x	x	-
U > switch point	-	x	x	-	x	x
Broken-wire in sensor circle	-	x	x	-	o	x

x= contact closed / LED lighting
- = contact open / LED out
o= LED flashing