

Limit-value switch for temperature, input NTC thermistor

- 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
- **CE** requirements
- Volt-free output as change over switch contact
- Open-circuit or closed-circuit variants available
- Short circuit monitoring of input signal
- Broken-wire monitoring of input signal
- Operating characteristics displayed by integrated LEDs
- Flame-inhibiting and self-extinguishing body
- Suitable temperature sensors are available (NORIS sensors TH.1, TH.2)

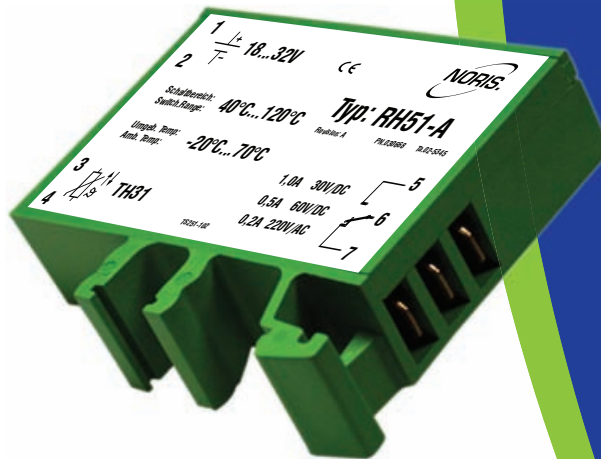
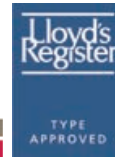


Image
RH51-A



Germanischer Lloyd

Limit-value switches of series 5

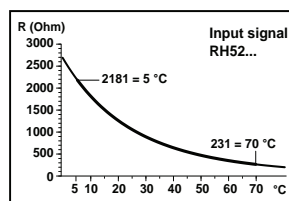
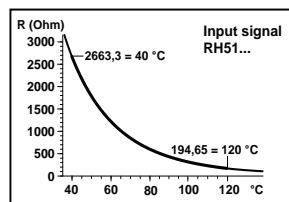
Limit value switches of the series 5 are designed to monitor and process electric measured variables.

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 RH5..

Description RH5..

The Type RH5.. is designed for the temperature monitoring with NTC (negative temperature coefficient) thermistors whose resistance decreases as the temperature is increased. Basically, any NTC-thermistor sensor can be used that possesses a characteristic that fits the limit-value switch. The use of NORIS sensors is recommended because they are matched to the limit-value switches. Settings of the limit value are made at the short top side of the switch by means of a drum scale. The scale is graduated in degrees Celsius to suit the specific measuring range of 40 ... 120 °C or 5 ... 70 °C. Any value on the drum scale can be selected as the limit value.



Monitoring for short circuit and circuit integrity

The RH5.. type series comes equipped for monitoring sensors for short circuits and integrity. In the event of a short circuit, the maximum limit value is exceeded, causing the relay output to oper-

ate, the red LED lights up just like when the limit value is exceeded in regular operation.

In the case of a wire break occurring in the sensor, the maximum value of the sensor signal will be exceeded, causing the relay output to operate and the red LED to light up. To identify sensor failure, the green LED will be flashing to signal a broken-wire condition.

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 RH5.. | |
|------------------------------|---|
| Supply voltage | $U_s = 18 \dots 32 \text{ V/DC}$, $U_R = 24 \text{ V/DC}$ |
| 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. 40 mA (24 V/DC) |
| Input signal | NORIS NTC thermistor TH.1, TH.2 |
| Input current | $< 7 \text{ mA}$ |
| 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 5 ... 70 °C for RH52..., 40 ... 120 °C for RH51.. |
| Reproducibility | $< \pm 0.2\%$ |
| Linearity of scale | $< \pm 1.5\%$ |
| Hysteresis | Approx. 1.5% |
| Sensor monitoring | Short-circuit at $R_t > 36 \text{ k}\Omega$ |
| 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 $f=10 \text{ kHz} \dots 2000 \text{ MHz}$, 80% AM @ 1 kHz 10 V/m $f=900 \text{ MHz} \pm 5 \text{ MHz}$, 50% AM @ 200 Hz 10 V/m $f=1800 \text{ MHz} \pm 5 \text{ MHz}$, 50% AM @ 200 Hz |
| Burst | IEC61000-4-4 $\pm 2 \text{ kV}$ supply $\pm 1 \text{ kV}$ sensor |
| Surge | IEC61000-4-5 sym. $\pm 1 \text{ kV}$ ($R_t=2 \text{ }\Omega$) asym. $\pm 2 \text{ kV}$ ($R_t=2 \text{ }\Omega$) |
| HF-susceptibility | IEC61000-4-6 3 V _{pp} 80% AM @ 1 kHz $f=0.01 \dots 100 \text{ MHz}$ |
| 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 |

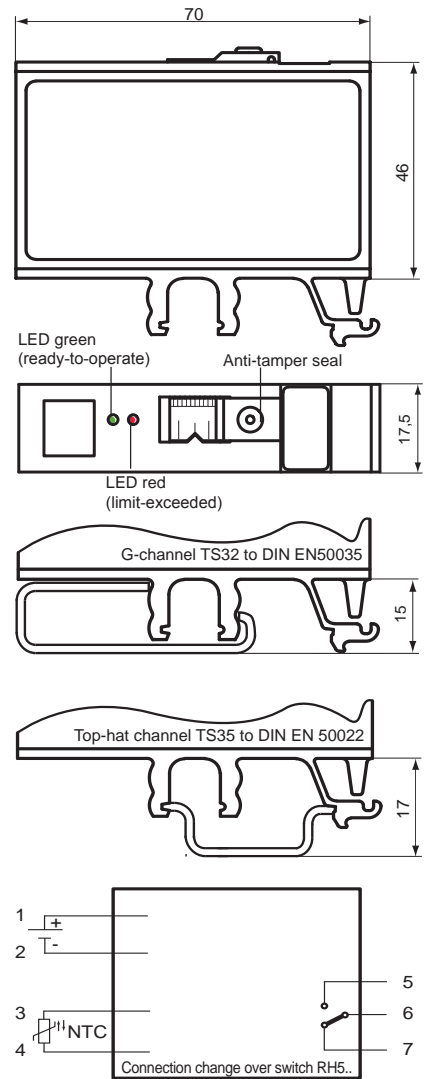
Type key / variants

| Input range: | 40 ... 120 °C | 5 ... 70 °C |
|--|---------------|-------------|
| Change over switch contact in closed current | RH51 | RH52 |
| Change over switch contact in open-circuit current | RH51-A | RH52-A |

| | |
|--------------|--|
| R | Limit-value switch |
| Input signal | |
| H | NTC resistance |
| Type series | |
| 5 | Type 5 |
| Input range | |
| 1 | 40 ... 120 °C = 2663,3 ... 194,65 Ω (NORIS temperature sensors TH.1) |
| 2 | 5 ... 70 °C = 2181 ... 231 Ω (NORIS temperature sensors TH.2) |
| Variants | |
| | Output contact as change over switch contact in closed current |
| - A | Output contact as change over switch contact in open-circuit current |

R H 5 1 - A (RH51-A) order example

Other Data



Relay position

| | RH5..-A | RH5..-A | RH5.. | RH5.. |
|--------------------------------|---------|---------|-------|-------|
| Terminal | 6/7 | 5/6 | 6/7 | 5/6 |
| R < limit value | x | - | - | x |
| R > limit value | - | x | x | - |
| Broken-wire in sensor circle | - | x | x | - |
| Short circuit 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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