# *Limit-value switch, input direct current*

RI5..

Limit-value switches

- **Straightforward application**
- **Suitable for severe operating conditions**
- **Compact construction**
- **Galvanic isolation of the input and output signal to the supply voltage**
- **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 and broken-wire monitoring with live-zero devices**
- **Operating characteristics displayed by integrated LEDs**
- **Flame-inhibiting and self-extinguishing body**

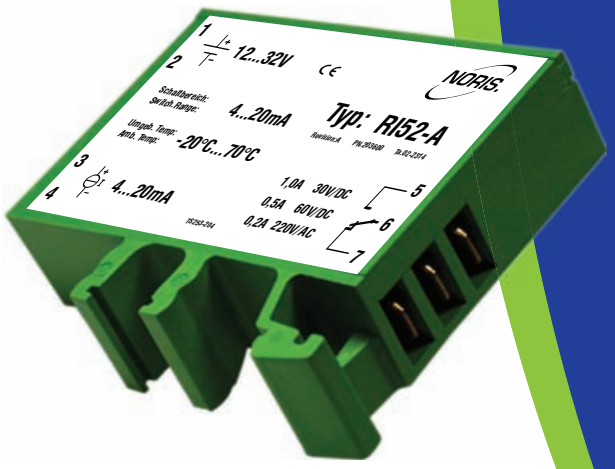



Image
RI52-A

## *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 RI5..*

**Description RI5..**

- Designed to monitor a direct current
- Devices from 0 ... 20 mA without live-zero-monitoring
- Devices from 4 ... 20 mA with live-zero-monitoring
- Limit value settings possible over complete input range by means of drum scale

**Integrity and short-circuit monitoring of input signal**

The integrated signal monitoring of the live-zero device provides monitoring of the sensor signal for broken wire and short circuit. If the measured signal falls below the limit at approx. 2 mA, the relay will operate. The red LED will light up and the green LED will be flashing. Limit-value switches with 0 ... 20 mA input are not available with broken-wire and short-circuit alarm of the sensor circuit.

**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 RI5.. | |
|---|---|
| Supply voltage | $U_S$ = 9 ... 32 V/DC, $U_R$ = 24 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 | Direct current RI51.. 0 ... 20 mA, RI52.. 4 ... 20 mA |
| Input resistance | < 150 Ω |
| 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 ... 20 mA for RI51.., 4 ... 20 mA for RI52.. |
| Reproducibility | < +/- 0.2% |
| Linearity of scale | < +/- 1.5% |
| Hysteresis | Approx. 1.5% |
| Sensorüberwachung | Broken-wire and short circuit below 1 V/DC (only 4 ... 20 mA devices) |
| Error class | IEC51-1 1.5% |
| Temperature sensitivity | < +/- 0.1% je 10 °K |
| Voltage sensitivity | < +/- 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/s² 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 +/- 8 kV |
| Electromagnetic field | IEC61000-4-3 10 V/m f=10 kHz ... 2000 MHz, 80% AM @ 1 kHz<br>10 V/m f=900 +/- 5 MHz, 50% AM @ 200 Hz<br>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 |
| 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 ... 20 mA | 4 ... 20 mA |
|---|---|---|
| Change over switch in closed current | RI51 | RI52 |
| Change over switch in open-circuit current | RI51-A | RI52-A |

### Device codes

| | |
|---|---|
| R | Limit-value switch |

**Input signal**

| | |
|---|---|
| I | Direct current |

**Type series**

| | |
|---|---|
| 5 | Type 5 |

**Input range**

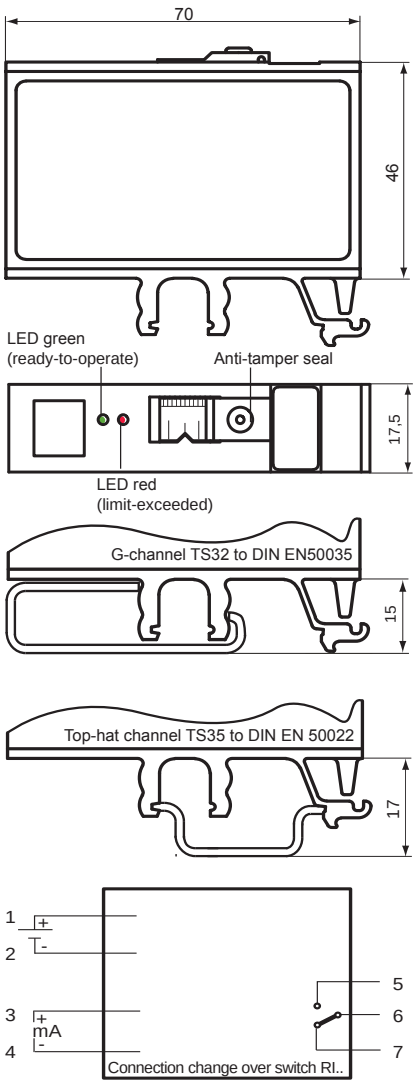
| | |
|---|---|
| 1 | 0 ... 20 mA |
| 2 | 4 ... 20 mA |

**Variante**

| | |
|---|---|
| | Output contact as change over switch contact in closed current |
| - A | Output contact as change over switch contact in open-circuit current |

R I 5 3 - A (RI53-A)

## Other Data




### Relay position

| | RI5..-A | RI5..-A | RI5.. | RI5.. |
|---|---|---|---|---|
| Terminal | 6/7 | 5/6 | 6/7 | 5/6 |
| I < limit value | x | - | - | x |
| I > limit value | - | x | x | - |
| Broken-wire in sensor circle (Live-Zero) | - | x | x | - |
| Short-circuit in sensor circle (Live-Zero) | - | x | x | - |

x = contact closed
- = contact open
The red LED is illuminated, if the limit value is exceeded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Changes reserve