

# Limit-value switch, input direct current

- 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

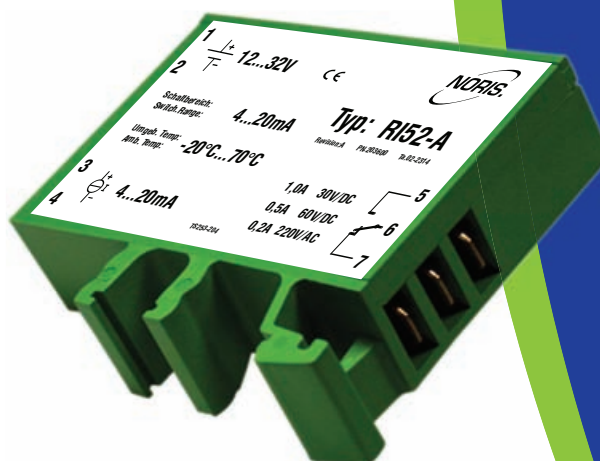


Image  
RI52-A



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 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	$U_s = 9 \dots 32 \text{ V/DC}$ ; $U_R = 24 \text{ V/DC}$
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	Direct current RI51.. 0 ... 20 mA, RI52.. 4 ... 20 mA
Input resistance	$< 150 \Omega$
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	$< \pm 0.2\%$
Linearity of scale	$< \pm 1.5\%$
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	$< \pm 0.1\% \text{ je } 10^\circ \text{K}$
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 <sup>2</sup> with 18 ms dwell time
Climatic test	IEC60068-T2-30
Operating temperature	$-20^\circ \text{C} \dots +70^\circ \text{C}$
Storage temperature	$-45^\circ \text{C} \dots +85^\circ \text{C}$
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 $f=900 \pm 5 \text{ MHz}$ , 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. $\pm 1 \text{ kV}$ ( $R_f=2 \Omega$ ) asym. $\pm 2 \text{ kV}$ ( $R_f=2 \Omega$ )
HF-susceptibility	IEC61000-4-6 3 V <sub>pp</sub> 80% AM @ 1 kHz $f=0.01 \dots 100 \text{ MHz}$
LF-susceptibility	IEC60553 3 V <sub>pp</sub> 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

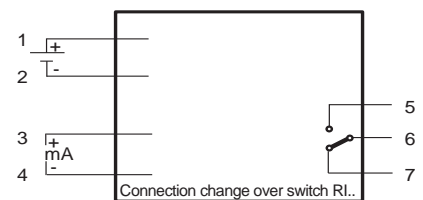
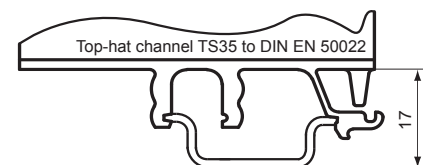
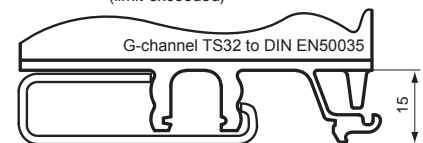
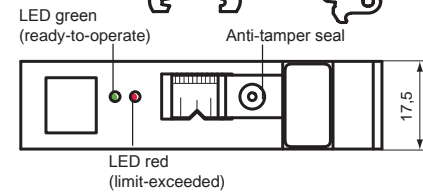
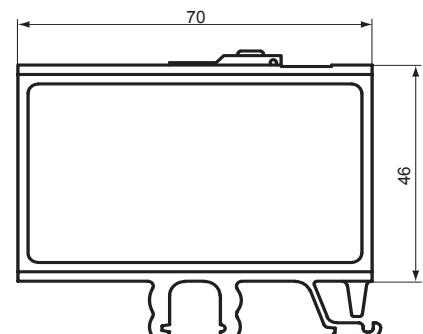
Input range:	0 ... 20 mA	4 ... 20 mA
Change over switch in closed current	RI51	RI52
Change over switch in open-circuit current	RI51-A	RI52-A

### Device codes

R	Limit-value switch
I	Input signal
I	Direct current
5	Type series
5	Type 5
1	Input range
0	0 ... 20 mA
2	4 ... 20 mA
A	Variante
	Output contact as change over switch contact in closed current
-	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



NORIS Automation GmbH  
Muggenhofer Strasse 95  
90429 Nuremberg  
Germany

Tel.: +49 911 3201-220  
Fax: +49 911 3201-150  
sales@noris-group.com  
www.noris-group.com