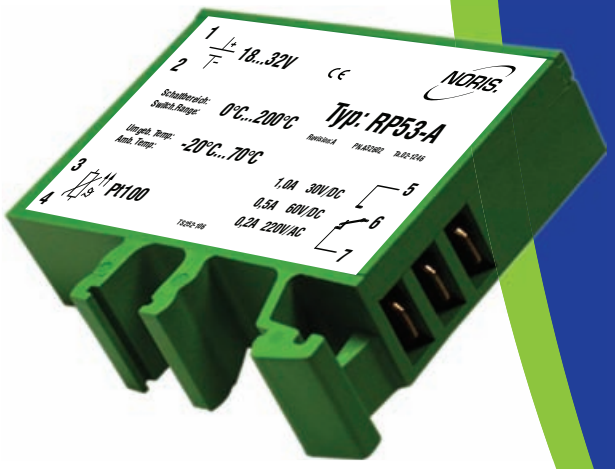
Limit-value switch for temperature, input Pt100/Pt1000 with two-wire-circuit

NORIS AUTOMATION

RP5.., RPT5..

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
  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 sensors are available (NORIS sensors TP.1, TP.2, TP.3)



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RP53-A

DNV BUREAU VERITAS Lloyd's Register TYPE APPROVED

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 RP5.., RPT5..

Description RP5.. and RPT5..

The limit-value switches RP5.. and RPT5.. are designed for the temperature monitoring with platinum Pt100 RTD (RP5..) or Pt1000 RTD (RPT5..) according to EN60751 Class B in two-wire circuit. A platinum resistor has a positive temperature coefficient which means that the resistance increases as the temperature rises. Access is provided to a trimming potentiometer to permit a line compensation to be applied for Pt100 RTD limit-value switches. Pt1000 RTDs do not require such compensation because, in principle, line resistance can be neglected. For better adaption to the required measuring task three measuring ranges are prepared: 0 ... 150 °C, 0 ... 120 °C, 0 ... 200 °C. 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. Any value on the drum scale can be selected as the limit value.

Monitoring for short circuit and circuit integrity

The RP5.. and RPT5.. type series comes equipped for monitoring sensors for short circuits and integrity. In the event of a wire break, the maximum limit value is exceeded, causing the relay output to operate, the red LD lighting up just as when the limit value is exceeded in regular operation.

In the case of a short circuit occurring in the sensor, the minimum value of the sensor signal will be passed downwards, 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 short circuit 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 RP5.., RPT5..	
Supply voltage	U_S= 18 ... 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. 40 mA (24V/DC)
Input signal	Pt100 RTD/Pt1000 RTD according to EN60751 Class B
Input current	RP5.. approx. 2 mA, RPT5.. approx. 1,5 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 0 ... 120 °C for RP.51.., 0 ... 150 °C for RP.52.., 0 ... 200 °C for RP.53..
Reproducibility	< +/- 0.2%
Linearity of scale	< +/- 1.5%
Hysteresis	Approx. 1.5%
Sensor monitoring	Broken-wire at R_i < 40 Ω (RP5..), < 400 Ω (RPT5..)
Error class	IEC51-1 1.5%
Temperature sensitivity	< +/- 0.1% je 10 °K
Voltage sensitivity	< +/- 0.1% for 10% change in 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 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
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 ... 120 °C		0 ... 150 °C		0 ... 200 °C	
	Pt100	Pt1000	Pt100	Pt1000	Pt100	Pt1000
Change over switch as closed current	RP51	RPT51	RP52	RPT52	RP53	RPT53
Change over switch as open-circuit current	RP51-A	RPT51-A	RP52-A	RPT52-A	RP53-A	RPT53-A

Device codes

R	Limit-value switch

Input signal

P	Pt100 (at 0°C 100 Ω)
PT	Pt1000 (at 0°C 1000 Ω)

Type series

5	Type 5

Input range

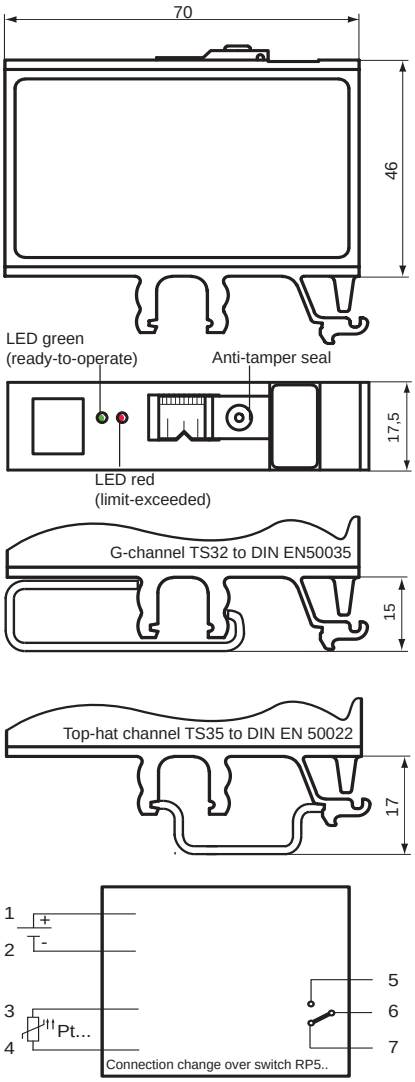
1	0 ... 120 °C
2	0 ... 150 °C
3	0 ... 200 °C

Variants

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

R P 5 1 - A (RP51-A) **order example**

Other Data



Relay position

	RPx5..-A	RPx5..-A	RPx5..	RPx5..
Klemme	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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Changes reserve