

# Limit-Value Switch for Temperature Thermistor Input (NTC)



- Easy to use
- Suitable for harsh operating conditions
- Compact design for mounting side by side
- Switch limit value can be adjusted using drum scale
- Seal feature for drum scale
- Meets high EMC-requirements
- Floating output contact
- Short circuit monitoring of input signal
- Broken-wire monitoring of input signal
- Thermoplastic housing (Makrolon 2805)
- Matching temperature sensors can be supplied



BUREAU  
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Germanischer Lloyd



Limit-Value Switch RH41M...



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The RH41M limit-value switch is a specially designed product for monitoring maximum temperatures in engine safety systems with a monitored open circuit arrangement. The monitored open circuit arrangement increases the availability of a system without eliminating self-monitoring of the closed circuit system in the event of a wire break and short circuit. The signal for constantly checking the functional reliability of the temperature sensor, sensor line, auxiliary voltage, relay and signal line can be evaluated separately from the temperature signal.

The device is used on a TS 32 mounting rail in the same way as a snap-on terminal. It is a special type of modular terminal block with an integrated electronic measuring and switching stage. Multiple modular switching devices can be connected side by side on a rail to save space and can also be combined with modular terminal blocks.

The required switching temperature can be set on a dial. The device design also envisages use in harsh/low environments in machinery applications.

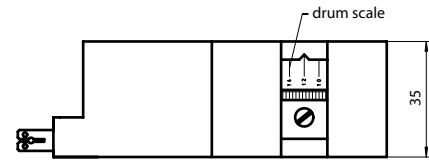
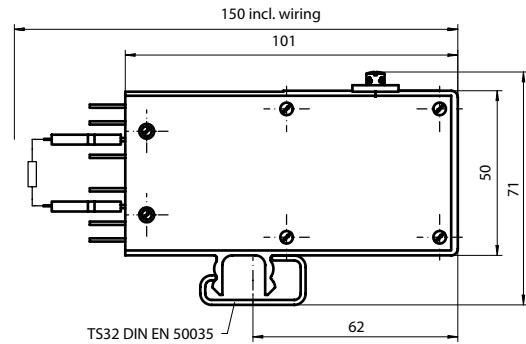
To enable line monitoring, the devices at connections 3 and 7 must be provided with a transition resistor. A value of 22 kΩ is quite common, but other values are possible and the resistor can also be connected by the customer. The resistance value must be based on the requirements of the monitoring system. The resistance value is identified by means of an addition to the type designation.

Bipolar wiring is used between the measuring element and the switching device. With a line length of up to 20 m, the faults specified in this data sheet will not be exceeded. If greater distances need to be covered, slightly larger faults may occur that are dependent on both the line length and the selected switch point. The polarity is irrelevant when connecting the connecting line. Shielded lines must be used. A distance of at least 0.1 m is to be observed in relation to power lines. No line compensation has to be performed; no compensating line and reference point are required. All connections to the switching device must be established using A 6.3 x 0.8 Faston connectors according to DIN 46245 (AMP connectors, etc.). The Faston connectors are included in the scope of supply.

## Technical Data

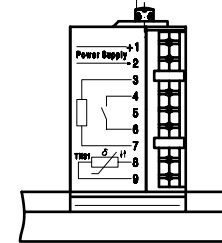
| Series RH41M...          |                                  |  |                                  |
|--------------------------|----------------------------------|--|----------------------------------|
| Connection               | Supply voltage                   | $U_s = 18 \dots 36 V_{DC}$   |                                  |
|                          | Current consumption              | Max. 10 mA   |                                  |
|                          | Reverse voltage protection       | Integrated   |                                  |
|                          | Overvoltage protection           | Integrated   |                                  |
| Output                   | Input signal                     | Thermistor: Temperature range 40 °C ... 120 °C (e. g. TH31)  |                                  |
|                          | Output                           | Floating relay contact (NO contact); $I_{max} = 0.5 A$ ; $U_{max} = 60 V$  |                                  |
|                          | Switching point                  | Adjustable with drum scale between 40 °C ... 120 °C  |                                  |
|                          | Line monitoring                  | Connection of an external transition resistor (usually 22 kΩ)  |                                  |
| Environmental influences | Connection contact               | Flat connector plug A 6.3 x 0.8; DIN 46244   |                                  |
|                          | Operating temperature            | IEC 60068-2-1/2: -25 °C ... +70 °C   |                                  |
|                          | Climatic test                    | IEC 60068-2-30   |                                  |
|                          | Storage temperature              | -40 °C ... +85 °C  |                                  |
|                          | Vibration resistance             | IEC 60068-2-6: up to 4 g   |                                  |
|                          | Degree of protection             | DIN EN 60529: housing IP20 with seal feature; connections IP00   |                                  |
|                          | ESD                              | IEC 61000-4-2 and EN 50121-3-2, table 9.3, evaluation criteria "A": ± 6 kV for contact discharge; ± 8 kV for air discharge |                                  |
|                          | HF-interference immunity housing | IEC 61000-4-3, GL2003 and EN 50121-3-2, table 9.1 and 9.2: f=80 MHz ... 2 GHz at 80% AM @ 1 kHz, E=10 V <sub>eff</sub> /m; |                                  |
|                          | Burst                            | IEC 61000-4-4, GL2003 and EN 50121-3-2, table 7.2: ±2 kV PowerL; IEC 61000-4-4, EN 50121-3-2, table 8.1: ±1 kV DataL       |                                  |
|                          | Surge                            | IEC 61000-4-5, GL2003 and EN 50121-3-2, table 7.3: 0.5 kV at the supply voltage with R <sub>s</sub> =2 Ω                   |                                  |
|                          | Conducted HF-interference        | IEC 61000-4-6, GL2003 and EN 50121-3-2, table 7.1 and 8.1: f=150 kHz ... 80 MHz at 80% AM @ 1 kHz, U=10 V <sub>eff</sub>   |                                  |
|                          | Conducted LF-interference        | IEC 60553: f=50 Hz ... 10 kHz, U=3 V <sub>eff</sub>  |                                  |
|                          | Mech. quantities                 | Case material  | Makrolon 2805                    |
|                          |                                  | Mounting   | Snapped onto TS 32 mounting rail |
|                          |                                  | Installation position  | Any                              |
|                          |                                  | Weight   | Approx. 100 g                    |
| Other                    | Reproducibility                  | ± 0.2 %  |                                  |
|                          | Linearity of scale               | ± 1.5 %  |                                  |
|                          | Hysteresis                       | Approx. 1.5 %  |                                  |
| Appr.                    | Accuracy class                   | IEC51-1: 1.5 %   |                                  |
|                          | Approvals                        | CE, GL and BV  |                                  |
|                          | Fire protection class            | V2   |                                  |

## Dimensions, Connection, Diagram



Flat connector plug A6.3 x 0.8 DIN 46244 with insulating sleeve in accessories kit

Capstan head screw according to DIN 404



### Switching state

Signal at output 4/6 (Contact position and internal resistance „R“ with various operating states)

| Operating state                                  | Contact (4-6) | Internal resistance „R“ (4-6) | Relay I    | Relay II   |
|--|---------------|-------------------------------|------------|------------|
| Normal   | open          | $R_x \Omega$ (e. g. 22 kΩ)    | active     | not active |
| Overtemperature                                  | closed        | 0 Ω                           | active     | active     |
| Auxiliary voltage failure                        | open          | $\infty \Omega$               | not active | not active |
| Short circuit (< ~40 Ω) in sensor line or sensor | open          | $\infty \Omega$               | not active | active     |
| Wire break (> ~1 MΩ) in sensor line or sensor    | open          | $\infty \Omega$               | not active | not active |

### Deliverable versions and ordering information

| Type       | Setting range | Colour coding | Transition resistor R Ω |
|------------|---------------|---------------|-------------------------|
| RH 41 M    | 40 ... 120 °C | white         | without <sup>1)</sup>   |
| RH 41 M 22 | 40 ... 120 °C | white         | 22 kΩ                   |

<sup>1)</sup> Transition resistor R specified and connected by user.

### Connection

