

Operating Manual STR100

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- Safety Temperature Limiter
Supply voltage AC230V



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1 General Notes

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, commissioning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.

Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

2 Display and controls

1 Reset button

2 Temperature Limit adjust

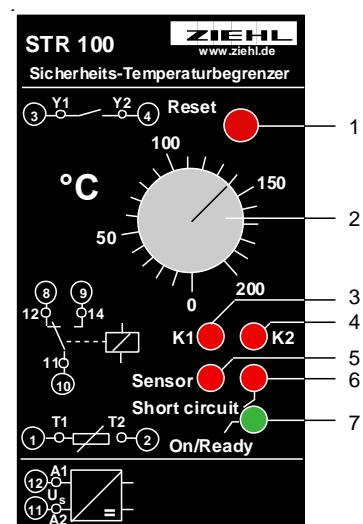
3 LED Alarm Channel 1

4 LED Alarm Channel 2

5 LED Sensor Line Interruption

6 LED Sensor Short Circuit

7 LED On / Ready



3 Application and short description

The Safety Temperature Limiter type STR 100 is an electronic thermostat monitoring the temperature of heating equipment and machinery. When the permitted temperature-limit is exceeded or in case of a malfunction, the STR 100 switches off without delay. An active reset must be made for a restart. The temperature limit is adjustable with a scaled potentiometer.

An unintended or unauthorized adjusting of the limit is prevented through a lead-sealed transparent cover.

With supply voltage switched on, the STR 100 operates in a changeable lockout mode and the relay must be started by a reset (manually with built-in reset button or external reset) to make contact (no) close. Applicable for plants with supervised operation. The mode of operation corresponds to type 2BJK according to EN 60730/VDE 0631.

The temperature is measured with a Pt 100 resistance temperature detector (RTD) according to EN 60751 / IEC 751. The process qualification in combination with the sensor must be proved. To fulfil affords for higher safety functionality the function has to be routine-tested periodically. The thermostat series STR 100 meets safety category 3 (Safety of machines EN 954-1, TÜV Rheinland documents T 24/00 + T103 2007 Z1). If safety approval is recommended only use listed RTD.

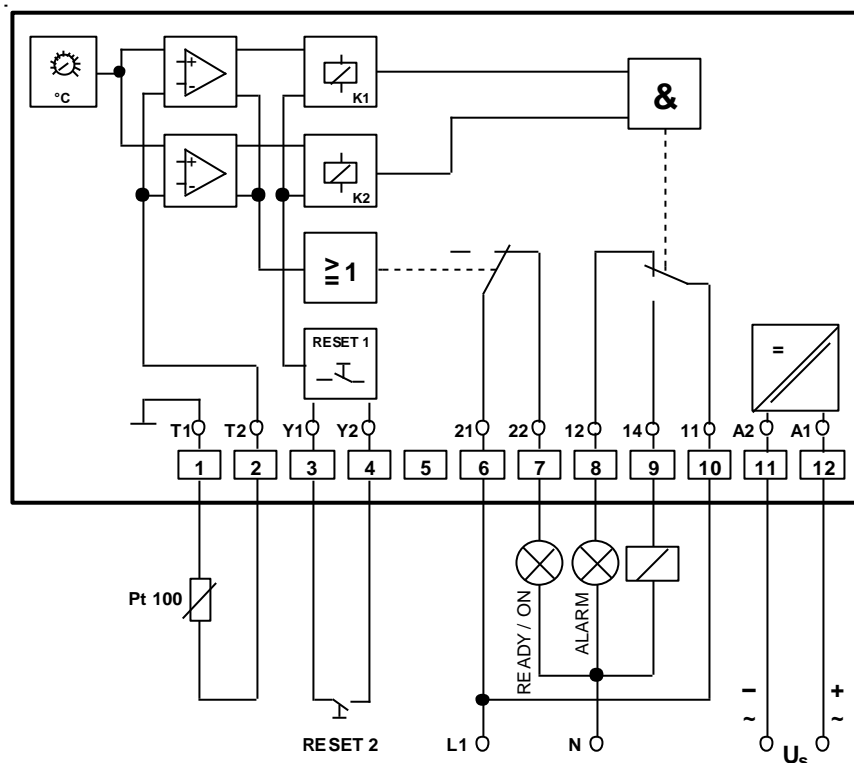
Temperature Limiter:

A temperature-limiter is an equipment that switches of permanently (locked) after the limit has been exceeded. A reset (manually or with a tool) is possible after the temperature has fallen below switch-back point (limit minus hysteresis).

Safety Temperature Limiter:

A safety temperature limiter is a limiter that fulfils in addition the requirements of extended safety according to DIN 3440.

4 Connecting diagram



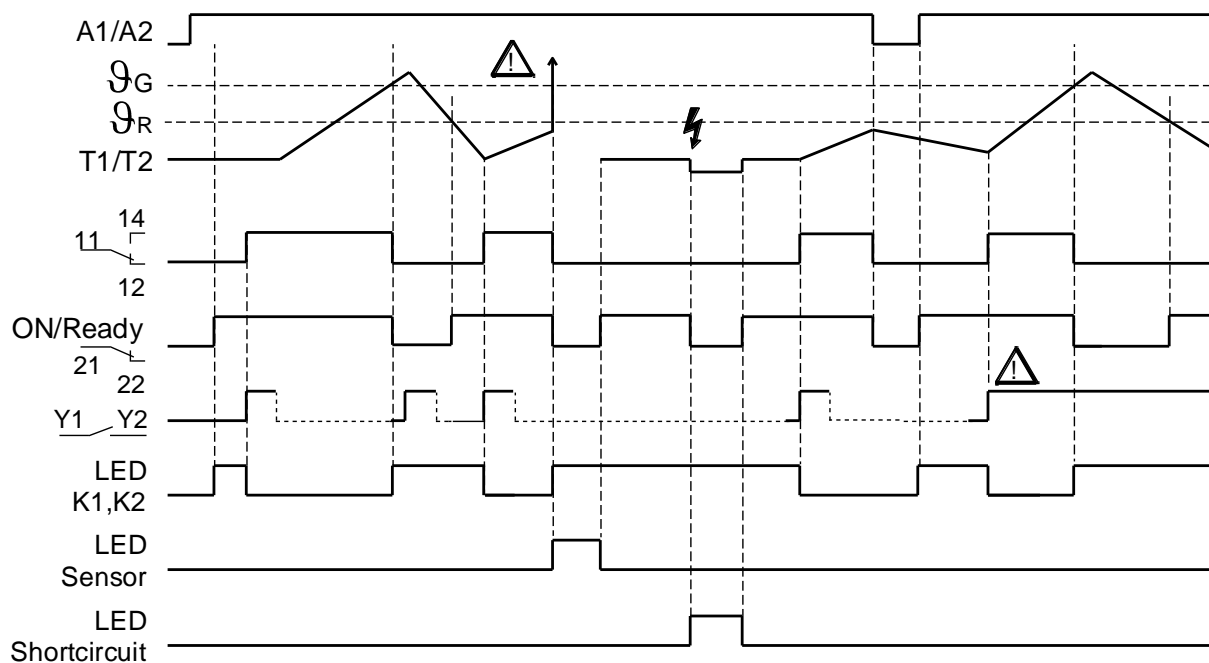
5 Detailed Description

The STR 100 measures the resistance of a Pt 100 RTD. The STR 100 monitors sensor line interruption and sensor short circuit. A red LED signals sensor failure.

The signal is sent to both independent electronic channels and compared with the preset limit. Every comparator sets a relay. The relay contacts are made in series thus the outputs operate as a single change over contact. When temperature is below the preset limit and there is no failure in the sensor circuit both relays K1 and K2 can pick up and contact 11, 14 is closed.

The red LED "Sensor" signals a failure in the sensor circuit and both relays release. Contact 11, 12 is closed for warning/alarm. The red LED K1 and LED K2 also signal alarm when temperature exceeds the preset limit and both relays K1 and K2 release. The green LED ON/Ready is not alight and control relay picks up, the contact at terminal 6,7 is open (break contact, nc). The STR 100 operates now in not changeable safety mode, the relays are locked. When temperature is app. 10 K below the limit the control relay (contacts 6/7 close) releases and the green LED is alight. The STR 100 now operates in changeable safety mode, the relays can be reset manually with built-in reset button or with external contact (make contact, no) at terminal Y1, Y2.

6 Function Chart



7 Important Information



DANGER!
Hazardous voltage!
 Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.



Before connecting the device to the mains voltage, make sure that the control Voltage U_s on the type plate corresponds to the mains voltage connected To the device!

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.

Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units.

The equipment is built according to DIN / EN and checked and leave the plant according to security in perfect condition. If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.

To maintain this condition, you must observe the safety instructions in this instruction manual titled "Important Information". Failure to follow the safety instructions may result in death, personal injury, or property damage to the equipment itself and other equipment and facilities.

Instead of the industrial norms and regulations written in this instruction manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.

Attention! If the device is damaged it may not be put into operation if it must be suspected, that a safe operation may be impossible. The input Reset 2 is not insulated from the sensor-input. If the sensor is connected with e.g. a heating-element, the input Reset 2 is on the same potential. It has to be made sure that this voltage cannot lead up to an electrical shock.

8 Installation

The device must be installed within rooms of international protection class IP 5x or better.

The device can be mounted:

- on 35 mm mounting rail according to EN 60715
- assembled with screws M4
- Wiring directly to plug base, connect wires as per wiring scheme

Apply mains voltage to terminals A1 and A2. The lines of the sensor circuit are to be routed as separate control lines

Observe the maximum admissible temperature when installing in a switchgear cabinet. Make sure sufficient space to other equipment or heat sources. If the cooling becomes more difficult e.g. through close proximity of apparatus with elevated surface temperature or hindrance of the cooling air, the tolerable environmental temperature is diminishing. Generally recommended minimum clearance is 20 mm.

The contacts of the reset push-button at terminal Y1, Y2 must be able to switch low current/voltages. We recommend gilded contacts with small bouncing behaviour to use.

9 Commissioning



Attention!
Do not plug in device alive or detach it from socket.

The safety function must be tested additionally to recurring examinations with maintenance services.

- Short circuit test: bypass sensor terminals T1, T2
- Line interruption test: disconnect sensor line at terminal T1 or T2

If an error is detected no restart must be induced until the error is cleared.

10 Error search

Red LED Sensor or Short circuit is alight! K3 picks up.

An error in the sensor-circuit has been detected. Check sensor and cables for short-circuit, interruption or unreasonable values

Red LED K1, K2 is alight:

The limit has been exceeded or the relay operates in a changeable lockout mode.

When the green LED Ready/On is alight, the relay can be switched on with the reset push-button.

External contact at Reset 2 – relay does not pick up:

Check contact and cables for short-circuit or interruption.

The contact of the reset push-button must be able to switch low signals (refer to technical data).

Relay contact 11,12,14 no current flow.

Internal fuse blown.

11 Technical data

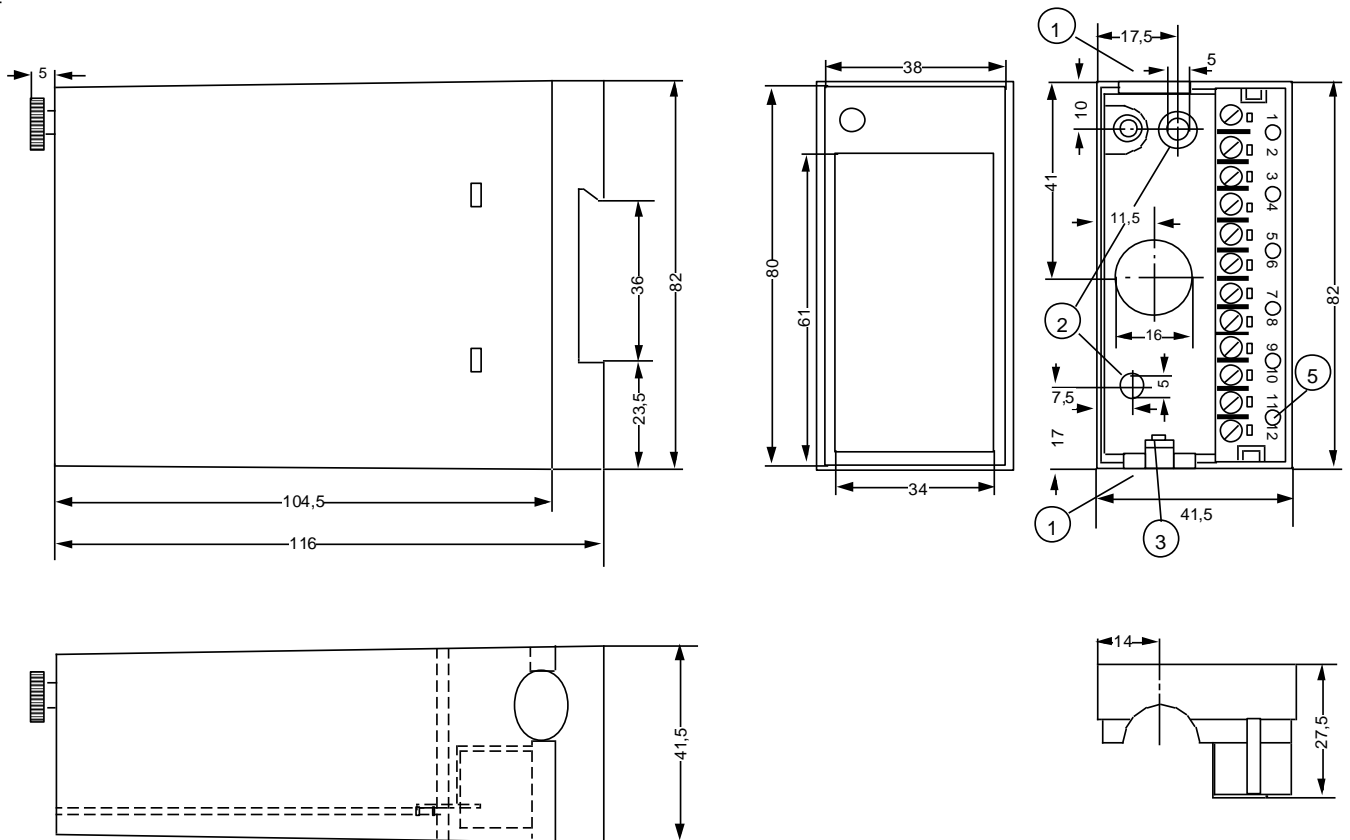
Power supply Us:	AC 230 V 50/60 Hz
Tolerance	AC 207 - 253 V
Power consumption	< 3 VA
Sensor connection	2-wire Pt100 according EN60751/IEC751
	$\alpha = 0,00385$
max. current	< 3,15 mA (< 10 mA at -200...+0 °C)
max. voltage	< 2 V, open terminal < 15 V
Line compensation (normally)	Standard 0,5 Ω , Option up to max. 30 Ω
Release function	
Release	Over temperature, interruption, short circuit and malfunction
Temperature limit	Adjustable, see temperature range
Accuracy	$\pm 3\%$ of scale
Repeatability	$\pm 1\%$
Hysteresis	10 °C ($\pm 25\%$) (3 °C at -200...+0 °C)
Reset	Internal reset button or contact (no) Y1, Y2
Temperature factor / Drift	0,2 K/10 °C
Relay output	11, 12, 14
Contact type	1 co contact, closed current circuit principle
Switching voltage	max. AC 400 V; DC 300 V
Switching current	max. 6A
Switching power (resistive load)	Max. 2000 VA max. 48 W at DC 24 V
Rated operational current I_e	2 A AC15 400V 3 A AC15 230V 2 A DC13 24 V
Recommended Fuse	4 A quick reaction
Mechanical contact life	3×10^7 operations
Electrical contact life	1×10^5 operations at 230 V/6 A
Factor of reduction at $\cos. \varphi = 0.3$	0,5
Relay output	21, 22
Contact type	1 nc contact, operating current principle
Switching characteristic minimum	12V 10mA AC/DC

Test conditions	EN 50178, EN 61010-1, EN 60947-5	
Rated impulse voltage	4000 V	
Overvoltage category	III	
Contamination level	2 (normal)	
Rated insulation voltage Ui	250 V	
On period	100 %	
Transformer	EN 61558-2-6 (VDE 0551)	
EMC tests	EN 61326-1 industrial environment	
EMC emission	EN 61326-1; CISPR 11 Class B	
EMC immunity	EN 61000-6-2, EN 61326-1 industrial environment	
Installation conditions		
Operating temperature	0 °C ... +50 °C EN 60068-2-2 dry heat	
Storage temperature	-20 °C ...+70 °C	
Altitude	< 2000 m above sea level	
Vibration resistance	1 mm at 25 Hz 10 g 25...100 Hz	
Shock resistance	10 g for 20 ms, 20 g for 4 ms	
Housing	Construction type S12	
Material housing	PA 6.6	UL94 V-2
Material socket	PA 6.6 GF25	UL94 HB
Dimensions (H x W x D)	82 x 42 x 121 mm	
IP-Code housing	IP40	
IP-Code terminals	IP20	
Mounting	35mm standard rail EN 60715 or with M4 screws	
Fitting position	any	
Wight	ca. 300 g	

Subject to technical changes

The declaration of conformity and the test-reports you find on our homepage www.ziehl.de

12 Housing Type S12



13 Disposal

Disposal should be carried out properly and in an environmentally friendly manner in accordance with legal provisions.