

Operating Manual TR111V

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- Pt100 Temperature-Relay

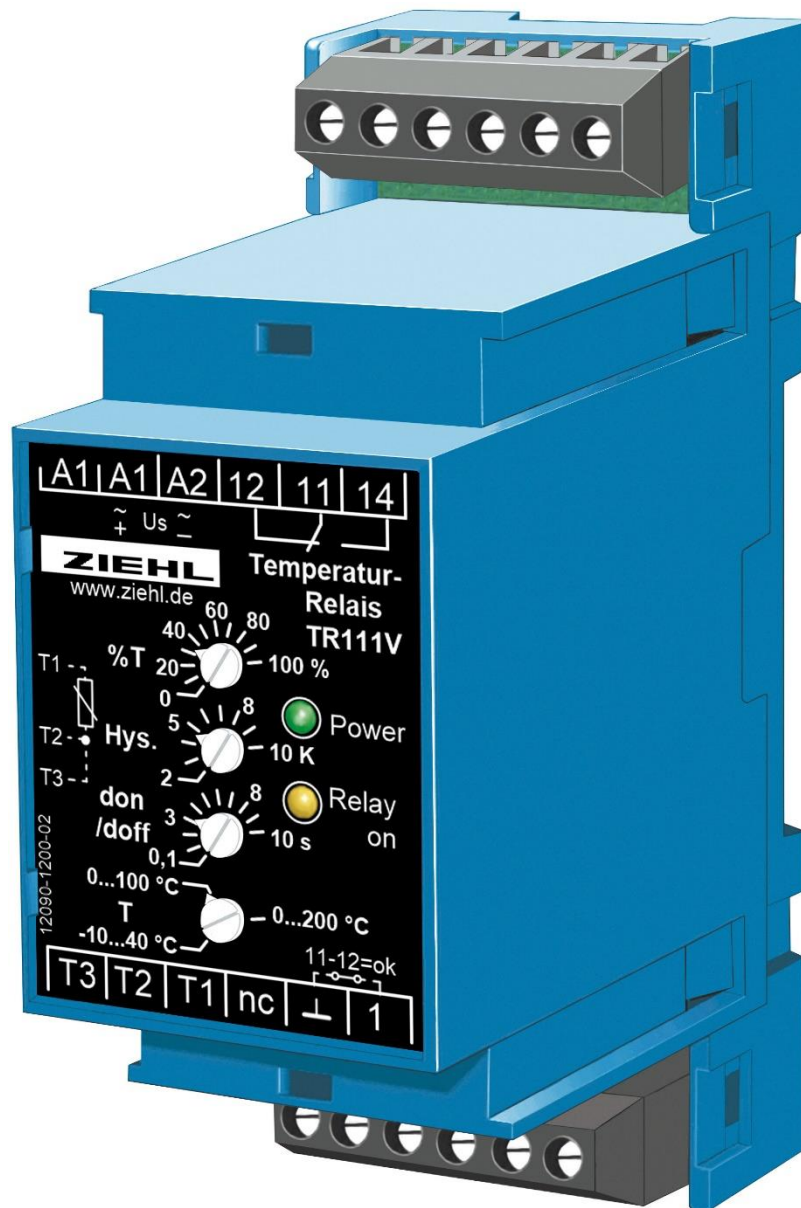
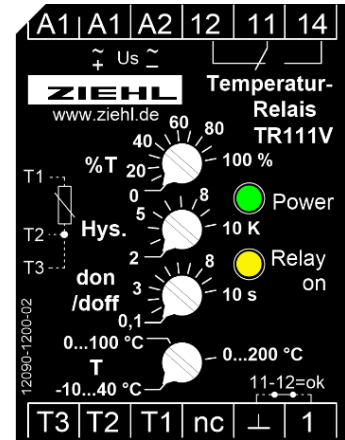


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1 Display and controls

- Potentiometer “%T” for limit value
- LED Power
- Potentiometer “Hys” Hysteresis
- LED Relay on
- Potentiometer Switching delay “don/doff”
- Potentiometer “T” Selection of measuring-range



2 Detailed description

As standard, the relay in the TR111V operates according to the closed-current-mode. If a temperature sensor is connected, the relay picks up (11-14 closed = ok). The relay releases in the case of a sensor error. If the temperature at the sensor exceeds the adjusted value, the relay releases. The state of the relay is signalled by a LED: relay picked up = LED on. At operating-current-mode the function of the relay is inverted. It picks up at over-temperature (11-12 closed = ok).

Remark

Sensors have to be connected with shielded cable. We recommend to connect it to ground on the sensor-side.

3 Application and short description

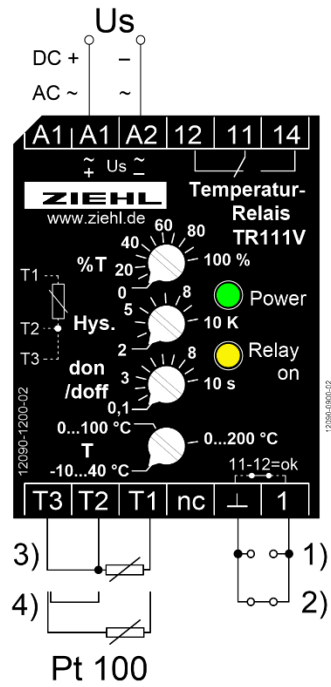
Temperature-Relays TR111V can be used as limit-switches or 2-point controllers with high repeat accuracy. 3 measuring-ranges, adjustable hysteresis and switching delay and the choice between operating- and closed-current principle of the relay make it a very universal device. Protection from over-temperature in processes, plants and machines. Monitoring of temperatures in bearings. Controlling of temperatures in processes and plants.

4 Overview of functions

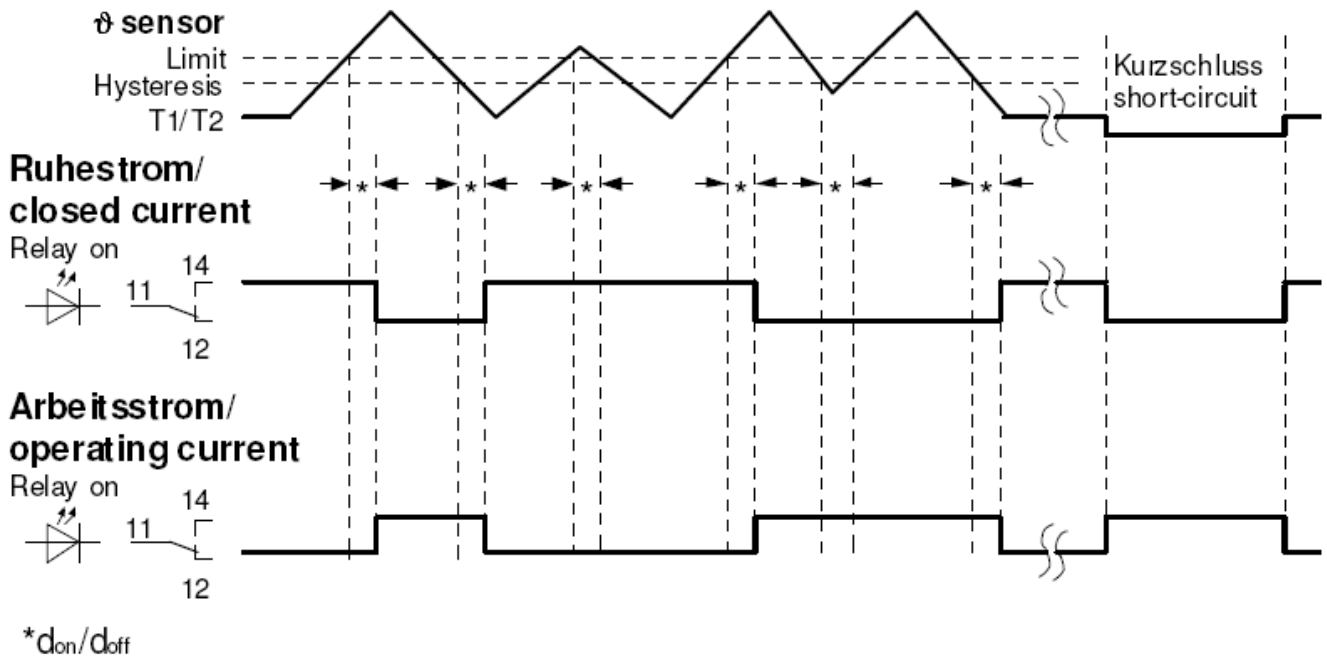
- Measuring input 1x Pt 100 (RTD) / 3-wire
- 3 or 4 measuring-ranges selectable
- 1 limit adjustable 0...100 %
- switching delay adjustable 0,1...10 s
- Output-relay 1 changeover-contact (co)
- Operating- or closed-current-principle
- Switching off at sensor-short-circuit or break
- LEDs for display state of relay
- Housing for mounting in switchgear cabinets or fuseboxes, 35 mm wide
- Mounting height 55 mm
- Universal supply-voltage AC/DC 24-240 V

5 Connecting diagram

- 1) closed current mode
- 2) operating current mode
- 3) 3-wire
- 4) 2-wire Bridge from T2-T3



6 Function diagram



7 Important Information



Attention!

Before switching on make sure that the operational voltage U_s of the lateral type plate and the main voltage are the same!



Attention!

Dangerous electrical voltage!

May cause electric shock and burns.

Before beginning work, switch the system and the device free of stress.



Attention!

When relay is set to operating-current mode! At loss of supply- voltage the relay doesn't switch. Depending on the application we recommend to monitor the supply voltage

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 are built according to 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.

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

8 Installation

- mount on 35 mm mounting rail according to EN 60715
- wall-mount with 2 x screws M4
- connecting wires refer to the connection plan.

9 Error search

The function of the device can be tested with help of a Pt 100-simulator or with a Pt 100-resistance table. The relay switches at exceeding of the limit, at sensor break or short-circuit.

10 Technical data

Rated supply voltage U_s	DC/AC 24 – 240 V	0/50/60 Hz
Tolerance	DC 20.4 - 297 V	AC 20 - 264 V
Power consumption	< 1.5 W	< 5 VA
Output relay K1	1 change over contact	
Switching voltage	max. AC 300 V; DC 300 V	
min. voltage / current	12 V 10 mA	
conventional thermal current I_{th}	max. 3 A	
Switching power max. AC $\cos \varphi = 1$	750 VA (250 V * 3 A)	
Contact life electrical	2 x 10 ⁵ operating cycles AC 250 V / 3 A 5 x 10 ⁵ operating cycles AC 250 V / 2 A 1 x 10 ⁶ operating cycles AC 250 V / 0,8 A	
Utilization category	AC-15 $I_e = 2$ A $U_e = 250$ V	
Rated operational current	DC-13 $I_e = 2$ $U_e = 24$ V	
Rated operational voltage	DC-13 $I_e = 0,8$ A $U_e = 60$ V	
	DC-13 $I_e = 0,4$ A $U_e = 120$ V	
	DC-13 $I_e = 0,2$ A $U_e = 240$ V	
Sensor connection	Pt100 (RTD) according to EN60751	
Sensor voltage	< 5 V	
Sensor current	< 2,5 mA	
Short circuit	< 15 Ω	
Type of connection	3- wire, max resistance 3x 25 Ω	
Limti value		
Measuring- ranges	3 or 4 ranges selectable	
3 measuring- ranges	-10...40 °C / 0...100 °C / 0...200 °C	
Repeat error	app. 1 K	
4 measuring- ranges	0...100 °C / 100...200 °C / 200...300 °C / 300...400 °C	
Repeat error	app. 1,6 K	
Error of setting	± 5 K	
Temperature- dependence	$\leq 0,05$ %/K	
Hysteresis	Adjustable app. 2... 10 K	
Switching delay d_{on}/d_{off}	Adjustable 0,1...10 s	
Testing conditions	EN 61010-1	
Rated impulse withstand voltage	4000 V	
Overvoltage category	III	
Pollution degree	2	
Rated insulation voltage U_i	300 V	
On period	100 %	
EMC-Tests	EN 61326-1 industrial environment	
emission	EN 61326-1; CISPR 11 class B	
immunity	EN 61326-1 industrial environment	
Electrical fast transient / Burst	EN 61000-4-4 ± 4 kV Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms	
SURGE	IEC 61000-4-5 ± 2 kV	
Electrostatic discharge	IEC 61000-4-2 ± 6 kV contact discharge, ± 8 kV air discharge	

Installation conditions

Rated ambient temperature range	-20 °C ... +55 °C		
Rated storage temperature	-40 °C ...+70 °C		
Installation height	< 2000 m above N.N.		
Climatic conditions	5-85% rel. Humidity, no condensation		
Permissible wiring temperature	-5 °C ...+70 °C		
Vibration resistance EN 60068-2-6	2...13,2	Hz ±1 mm	13,2...100 Hz 1 g
	2...25	Hz ±1,6 mm	25...150 Hz 5 g

Housing

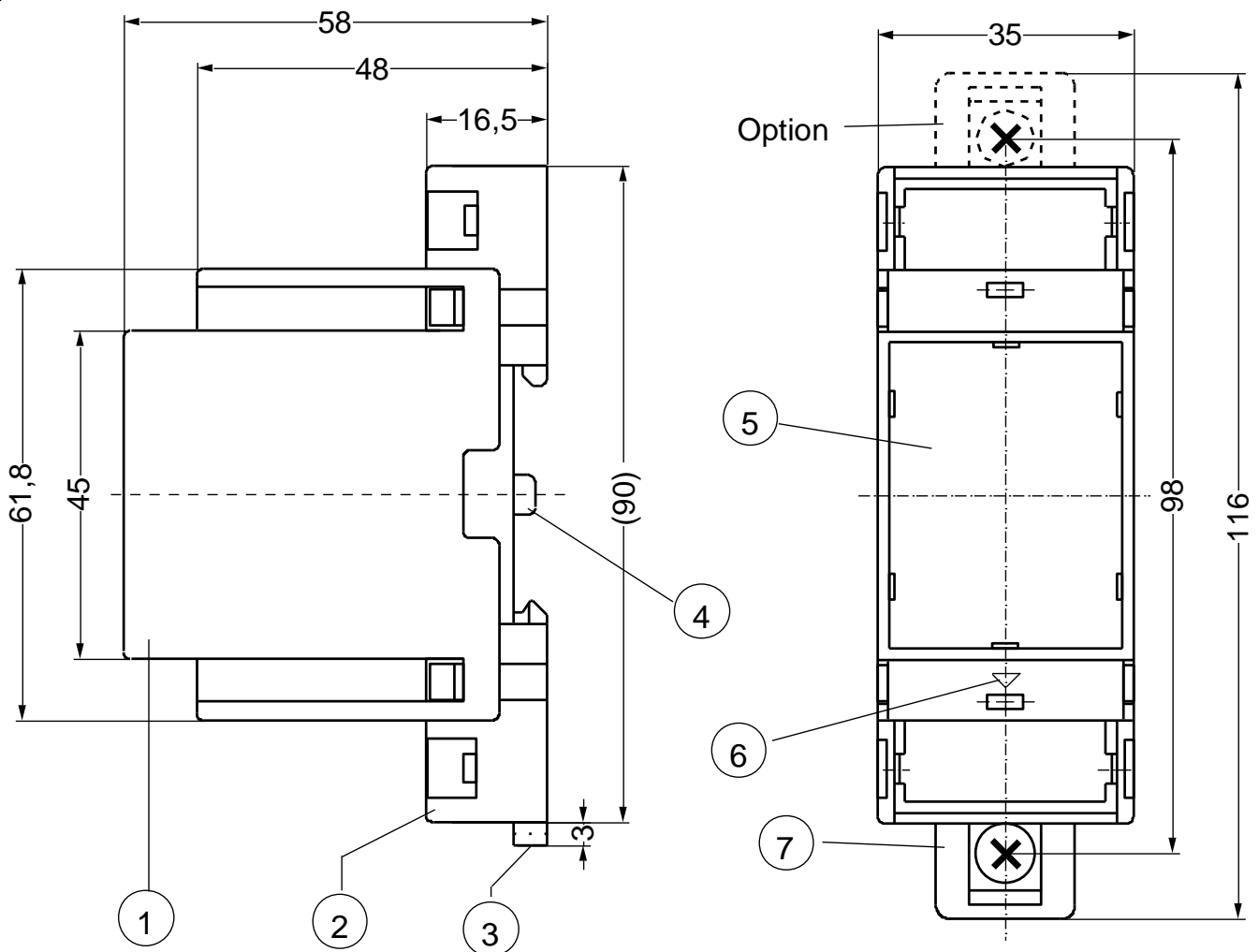
Design V2

Mounting height	55 mm
Dimension (H x W x D)	90 x 35 x 58 mm
Line connection solid wire	1 x 0,34 - 2,5 mm ² / AWG 22 - 12
Strand wire with insulated ferrules	1 x 0,1 -1,5 mm ² / AWG 27 - 14
Stripping length / torque	8 mm / 0,5 Nm
Protection class housing / terminals	IP 30 / IP20
Attachment mounting	35 mm standard rail according to EN60715 or screw mounting M4 (additional bolt not included)
weight	Approx. 100 g

Subject to technical modifications

11 Housing Type V2

Dimensions in mm



- 1 Oberteil / cover
- 2 Unterteil / base
- 3 Riegel / bar for snap mounting
- 4 Plombenlasche / latch for sealing
- 5 Frontplatteneinsatz / front panel
- 6 Kennzeichen für unten / position downward
- 7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung \varnothing 4,2 mm /
For fixing to wall with screws, \varnothing 4,2 mm