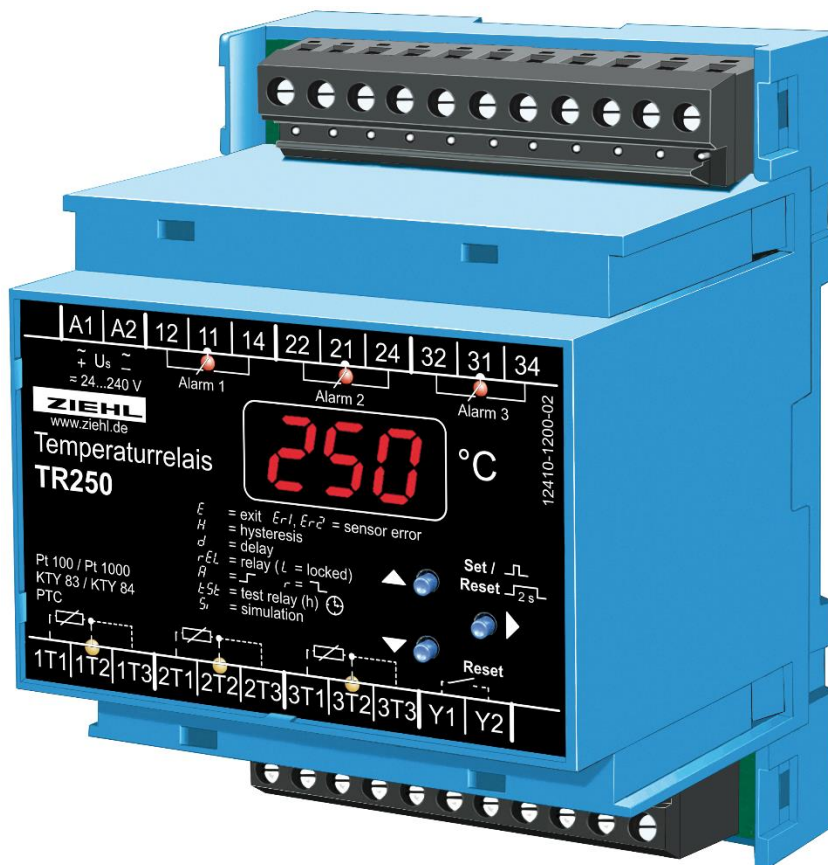


Operating Manual TR250

updated: 2018-07-24/Fz

- Temperature-Relay TR250



New from firmware -03

- Alarm counter for 99 alarms (alarm 1 ... alarm 3), with relative time (elapsed time since alarm) and reason for alarm (sensor)

New from firmware -01

- Program Pr5 for protection of transformers with 2 PTC-circuits (sensor-alarm, pre-alarm and tripping)
- Program Pr6 for Protection of transformers with 3 PTC-circuits (forced cooling, pre-alarm and tripping)

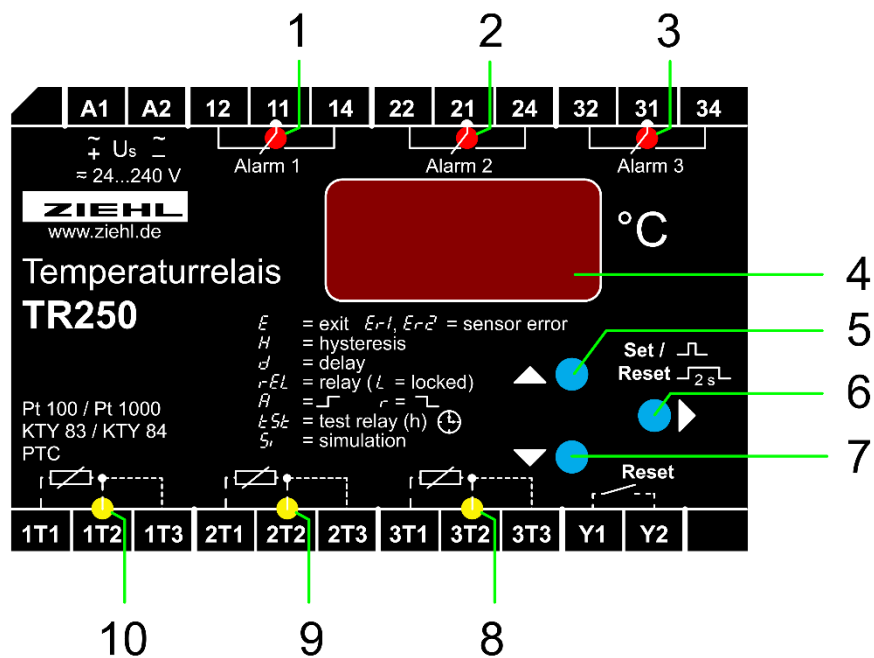
Display of firmware version: Press Set ► for 10 s (in display mode)



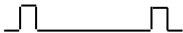
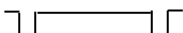
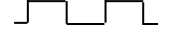
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1 Display and operating elements



1, 2, 3 LEDs Alarm

- OFF
- Flash 
- ON
- Flash 
- Flash 
- ON in programming mode

Switching point not exceeded
 Switching delay time d_{AL} runs
 Switching point exceeded, relay switches
 Switching back delay time d_{oF} runs
 Ready for Reset, switching interlocked
 Selected sensor or sensor group (8, 9, 10) acts on this alarm

4 3 digit digital display

- Display temperature
- Display alarm
- Display error messages
- In programming mode

Appropriate LED Sensor is alright
 RL 1 / RL 2 / RL 3, appropriate LED Alarm is alright
 E_{r1} = short-circuit in sensor or line
 E_{r2} = break of sensor or line
 $E_{r3/4}$ = internal error of device
 E_{rr} = common error
 EEE = measured values too high
 $-EE$ = measured values too low
 Display of values and functions
 see [10. Operation](#)

5, 7 button ▲ or button ▼

- Press short
- Press for ≥ 2 s

Switch to menu mode, the right decimal-point lights
 Display stored MIN- and MAX- temperature values of selected sensor. Simultaneously pressing of button Set ► for ≥ 2 s deletes all stored MIN- and MAX- temperature values.

6 button Set / Reset ▶

- Press short Display next sensor
- Press short in menu mode switch to programming mode, the right decimal-point flashes
- Press short in programming mode switch to next point, the set value will be stored
- Press for 10 s when switching on supply voltage until displayed „Pr 1“ . With buttons ▲/▼ it can be select one of these options

Pr 1	Program 1 (factory setting)
Pr 2	Program 2
Pr 3	Program 3
Pr 4	Program 4
Pr 5	Program 5 (from firmware -01)
Pr 6	Program 6 (from firmware -01)
°C	Resolution 1°C
0.1°C	Resolution 0,1°C
°F	Resolution 1°F

With press „Set“ the device reboots. For a new selection this must be repeated.

- Press for ≥ 2 s Reset Relay locked switching
- Press for ≥ 4 s Display program number (from firmware -01)
- Press for ≥ 10 s Display firmware version

8, 9, 10 LEDs Sensor

- ON Temperature value of this sensor is being displayed
- Flash Error of displayed sensor, associated alarm LED lights
- 2 or more LEDs Sensor ON Warmest of those sensors in display
- Alternating illumination All sensor values are displayed for 2s each consecutively
- ON in programming mode Selected sensor (8, 9, 10) or sensor error acts on this alarm

Hints:

- Longer pushing of ▲/▼ accelerates the changes in the display
- Button ▲/▼ pushed at the same time sets actual programmed parameter to zero

2 Default Settings

Ex works, 6 programs are selectable. Based on these programs, the relay can be easily adapted to the application. Normally only the temperatures of the alarms have to be changed.

Press button Set ► for 10 s when switching on supply voltage. After that the program Pr 1 . . . Pr 4 (from firmware -01: Pr 1 . . . Pr 5) and/or the display value (°C / 0,1°C / °F) can be selected with ▲/▼ and confirmed with Set ► (°C = Resolution 1°C, 0,1°C = Resolution 0,1°C, °F = Resolution 1°F).

Pr 1: Protection of motors/generators with 3 sensors Pt 100 (Pr 1 is factory setting)

AL 1 = pre-alarm,
AL 2 = tripping,
AL 3 = sensor-alarm (all sensors).

Pr 2: Protection of transformers with 3 sensors Pt 100.

AL 1 = forced cooling with a periodically test 1/week,
AL 2 = pre-alarm and sensor-alarm (all sensors),
AL 3 = tripping.

Pr 3: Protection of transformers with 1 sensor Pt 100 and 2 PTC-circuits.

AL 1 = forced cooling with a periodically test 1/week (Pt 100),
AL 2 = pre-alarm and sensor-alarm (all sensors) (PTC),
AL 3 = tripping (PTC)

Pr 4: Single association

S 1 – AL 1,
S 2 – AL 2,
S 3 – AL 3

Pr 5: Protection of transformers with 2 PTC-circuits (from firmware -01).

AL 1 = sensor-alarm (sensor S2 and S3),
AL 2 = pre-alarm
AL 3 = tripping

Pr 6: Protection of transformers with 3 PTC-circuits (from firmware -01).

AL 1 = forced cooling with a periodically test 1/week
AL 2 = pre-alarm and sensor-alarm (all sensors)
AL 3 = tripping

Alarm (AL 1...AL 3) = Relay (1 ... 3).

Sensor type PTC (thermistor): Display of resistance of sensor in kΩ

Pr.-No.		P _{r1} *	P _{r2}	P _{r3}	P _{r4}	P _{r5} *1	P _{r6} *1		
App-lication	Explanation	Motor-protection 3x Pt 100	Transformer-protection 3x Pt 100	Transformer-protection 2xPTC +1xPt 100	1 Sensor/ Relay	Trans- former- protection 2xPTC	Trans- former- protection 3xPTC	User Data	
5 1	Sensor-type	100 (3-L)	100 (3-L)	100 (3-L)	100(3-L)	nc	PTC		
	Alarm	1+2	1+2+3	1	1	-	1		
5 2	Sensor-type	100 (3-L)	100 (3-L)	PTC	100 (3-L)	PTC	PTC		
	Alarm	1+2	1+2+3	2	2	2	2		
5 3	Sensor-type	100 (3-L)	100 (3-L)	PTC	100 (3-L)	PTC	PTC		
	Alarm	1+2	1+2+3	3	3	3	3		
RL 1	Temperature (°C)	120	130	90	50	250	PTC		
H	Hysteresis (°C)	-5	-10	-10	-2	-5	-		
dRL	Switching-delay-time (s)	0	0	0	0	0	0		
doF	Switching-back-delay (s)	0	999	999	0	0	999		
rEL	Function of Relay	r	R	R	r	r	R		
Err	Error (from sensor)	-	-	-	1	2+3	-		
RL 2	Temperature (°C)	130	140	PTC	50	PTC	PTC		
H	Hysteresis (°C)	-5	-5	-	-2	-	-		
dRL	Switching-delay-time (s)	0	0	0	0	0	0		
doF	Switching-back-delay (s)	0	0	0	0	0	0		
rEL	Function of Relay	r	r	r	r	R	r		
Err	Error (from sensor)	-	1+2+3	1+2+3	2	-	1+2+3		
RL 3	Temperature (°C)	250	155	PTC	50	PTC	PTC		
H	Hysteresis (°C)	-5	-5	-	-2	-	-		
dRL	Switching-delay-time (s)	0	0	0	0	0	0		
doF	Switching-back-delay (s)	0	0	0	0	0	0		
rEL	Function of Relay	r	R	R	r	R	R		
Err	Error (from sensor)	1+2+3	-	-	3	-	-		
tSt	Periodically testing	OFF	ON	ON	OFF	OFF	ON		
	Alarm ON	-	AL1	AL1	-	-	AL1		
don	Test period (h)	-	168	168	-	-	168		
doF	Test time (h)	-	0,2	0,2	-	-	0,2		
S _i	Simulation	-							
cod	Code-lock on/off	oF	oF	oF	oF	oF	oF		
	PIN-Code	504	504	504	504	504	504		

* Factory settings

*1 from firmware -01

3 Application and short description

Short Description

Thermostats TR250 monitor up to 3 sensors at the same time. Output-relays and sensors can be associated freely. Several programs like monitoring 3 sensors for the same switching point with common alarm (e.g. for monitoring motors or transformers) are selectable.

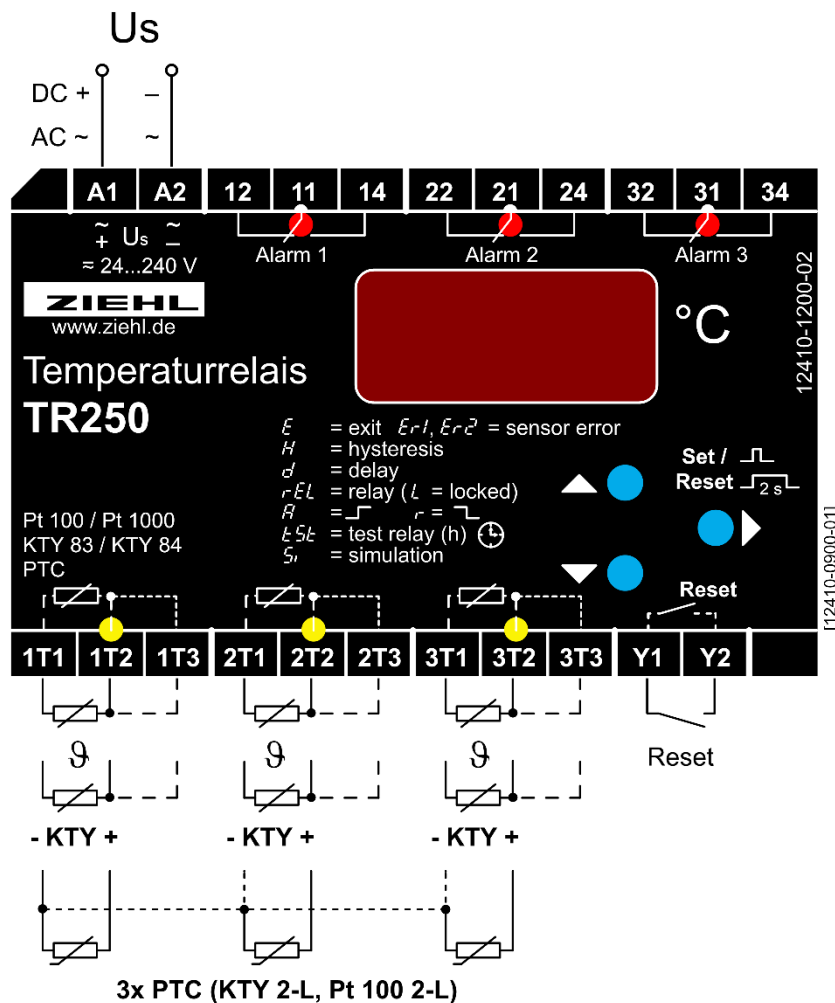
Applications

- Protection of motors or generators against overload, also with simultaneous monitoring of temperatures in bearings
- Protection of dry transformers against overload, also with control of a forced cooling
- General protection of motors and machines against over-temperatures
- Temperature-controller, also for refrigerating systems
- Monitoring of differences in temperature
- Resolution 0.1 °C for measuring range -19.9...99.9 selectable

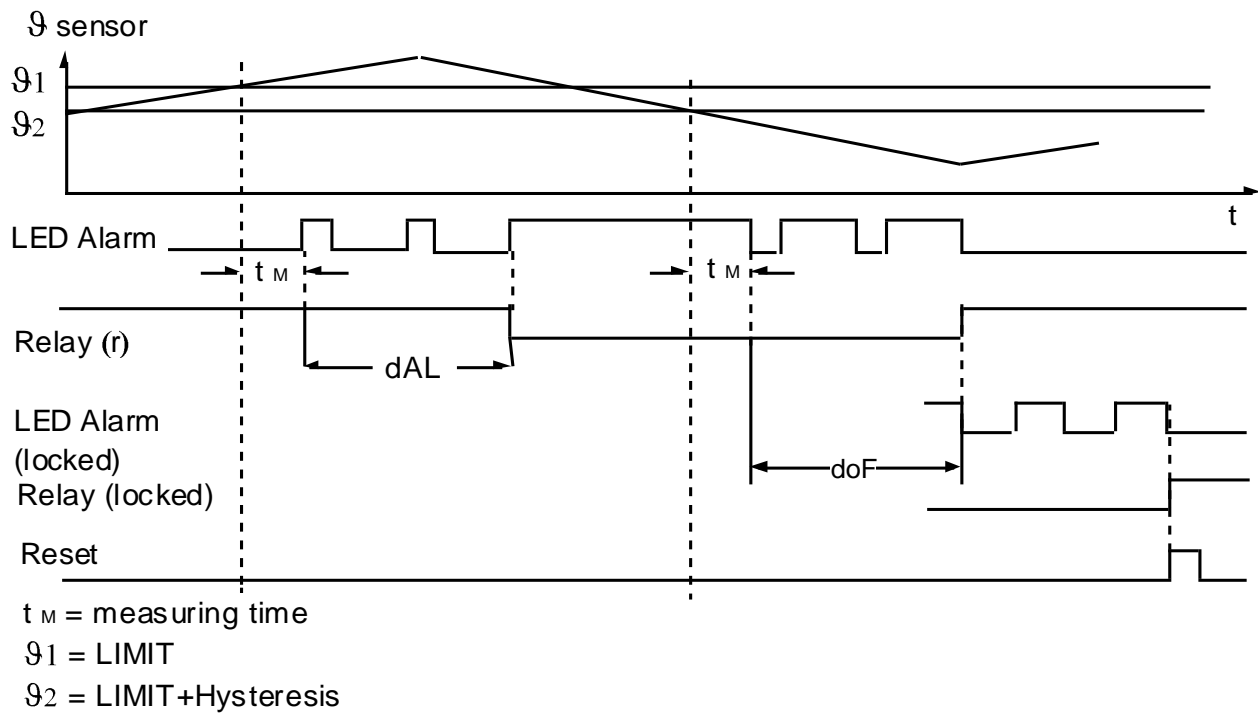
4 Function Overview

- sensor-inputs, Pt 100 (RTD) or Pt 1000 in 2- or 3-wire-connection
- KTY 83, -84, PTC (thermistors)
- relay-outputs (1 change-over-contact each)
- universal power-supply AC/DC 24-240 V

5 Connecting diagram



6 Function Diagram



Time of Response – Measuring-time t_M

The time of response depends on the number of connected sensors and the measuring function. At continuously change temperatures, measuring-time t_M is app. 2 s. At rapidly changing temperature, such as appears when simulating temperatures with a potentiometer, measuring time t_M is app. 4 ... 6 s.

Relay locked switching

In this mode, relay will only switch back, when switching-back-temperature has been reached, switching back delay time has passed and a reset has been made (button, contact Y1-Y2 or switching off and on of the TR250). Readiness is displayed by flashing (1:1) of appropriate alarm-LED.

7 Important notes



DANGER!
Hazardous voltage!
Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this 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/IEC and checked and leave the plant according to security in perfect condition. To keep this condition, observe the security instructions with the headline „Attention” in the instructions manual. Ignoring of the security instructions may lead to death, physical injury or damage of the equipment itself and of other apparatus and equipment.

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.



Attention! When all relays are programmed in operation current mode (=pick up at alarm), a loss of the supply voltage or an instrument failure can remain unidentified. When the relay is applied as control instrument, the operator must ensure, that this error is recognized by regular examinations. We recommend to program and accordingly evaluate at least one relay in the closed-circuit current mode.

Attention! Connection of Sensors

Temperature sensors must be connected to the plug-in terminals 1T1, 1T2, 1T3 etc. To ensure proper operation this plug-in terminals have gold-plated contacts. Do not use these plugs for other terminals.

Universal power supply

The TR250 universal power supply works within the range AC/DC 24-240 V. Before switching on make sure, that the rated supply voltage U_s of the type- plate and the mains voltage are the same.

8 Installation

The unit can be installed as follows:

- Installation in switchgear cabinet on 35 mm mounting rail according to EN 60715
- With screws M4 for installation on walls or panel. (additional latch included in delivery)

Connection according to connection plan or type plate.



A circuit-breaker or switch must be situated within easy reach of the unit and fused. Installation excess current protection should be ≤ 10 A.

9 Putting into operation

9.1 Display Mode

Indication of the actual temperature of the warmest sensor. LEDs (yellow) show, which sensor or group of sensors is selected. Change with Set ►.

Indication of the stored minimum- resp. maximum-value: Press up ▲ or down ▼ for 2 s. Reset min/max with Reset ► for 2 s.

Leave Display Mode with buttons ▲/▼.

Sensors type Pt ... resp. KTY ...: indication of temperature in °C (optional °F)

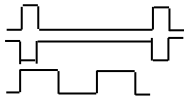
Sensor type PTC (thermistor): indication of resistance of sensor in kΩ

LEDs Sensor in Display Mode

ON	Value of this sensor is being displayed
Flash	Sensor Error
2 or more LEDs Sensor ON	warmest of those sensors in display
Alternating illumination	All sensor values are displayed for 2s each consecutively

LEDs Alarm in Display Mode

OFF	Switching point not exceeded
ON	Switching point exceeded, relay switches
Flash	Switching delay time dAL runs
Flash	Switching back delay time doF runs.
Flash	Ready for Reset, switching interlocked.



Reset by button RESET ► or closing of a contact at terminals Y1-Y2.

A continuously closed contact at Y1-Y2 doesn't result in a reset.

During periodical relay-test the appropriate LED lights up.

9.2 Programming Mode

9.2.1 Alarm counter RC

➤ from firmware -03:

Select menu item with ▲/▼ until RC is displayed.

With Set ► to alarm counter RC 1. The number of stored alarms is displayed alternating with RC 1.

With ▼ alarms are displayed (latest first). In display number of alarm (n..) is alternating with elapsed time since last alarm (with supply voltage on). (n 14 / 12.5 = alarm no 14 / elapsed time 12 hours, 50 minutes, resolution 10 minutes).

The yellow LEDs at the sensors show, which sensor has caused the alarm.

LED on = limit exceed at this sensor.

LED blinking = error at this sensor.

All LEDs off = test relay.

With ▲/▼ select next/previous alarm.

With Set ► forward to alarm counter 2 and 3.

By pressing Set ► for ≥ 2s all alarms are deleted and return to display mode.

Hint: Elapsed time is stopped when supply voltage is off.

Time is updated every 10 minutes. A deviation of 10 minutes is possible.

9.2.2 Programming of sensors 1-3 (S 1/S2/S3)

Select menu item with ▲/▼ until S 1 and type of sensor are alternating in the display, e.g. S 1 / 100 for Pt 100. Here it can be clearly read out, which type of sensor is selected and which alarms are affected by this sensor (red LED Alarm on).

Enter into programming with Set ►.

- Select type of sensor with ▲/▼ (d. F can be selected at S3, if S 1 and/or S2 are not PTC. with S3 = d. F it is handled as difference sensor 2 minus sensor 1).
- Compensate line-resistance (enter value of resistance of line) or select 3-wire or n.c. (not connected, if no sensor is connected to this input). At setting PTC no compensation of line-resistance is necessary/possible.

9.2.3 2-wire, compensation of line-resistance

To compensate the line resistance, short-circuit the wires nearby the sensor and measure the line resistance. With 2-wire connection and a common line for all signals, all sensor measuring currents will be added on the common line. Thus, the value of the compensation line resistance R_K must be calculated as follows:

$R_K = (n+1) \times R_L / 2$ (R_L = line resistance of two wires, n = number of sensors)

We recommend using 2 or bettering 3 wires for each sensor.

- Combination of sensor and Alarms (R_L/E), **important:** Here it is programmed, which alarms (=relays) are affected by the sensor. Select alarm with $\blacktriangle/\blacktriangledown$. Set switches alarm on or off (see red LED at alarm-contacts). The LEDs of the activated alarms are alight.

Leave menu item with button Set \blacktriangleright when E is in display (on to next menu item)

9.2.4 Programming of Alarms 1-3 ($R_L1/R_L2/R_L3$)

Select menu item with $\blacktriangle/\blacktriangledown$ until R_L1 and Limit (value) alternate in display, e.g. R_L1 and 130 for 130°C .

Here it can be clearly read out, which limit is programmed and of which sensors the alarm is effected (yellow LEDs sensor on).

Enter into programming with Set \blacktriangleright .

- Set limit with $\blacktriangle/\blacktriangledown$. At sensors type P_{TC} no limit can be programmed.
- Hysteresis. Negative hysteresis = MAX-alarm, the relay switches at the programmed limit and switches back after the temperature is below the limit by the value of the hysteresis. E.g. limit 130°C and hysteresis -5°C : Relay switches at 130°C and back at 125°C . Positive hysteresis everything inverted = MIN-limit. At sensors PTC no hysteresis can be programmed.
- Alarm delay d_{RL} : An alarm is being suppressed for this time. Short exceeding of the limit does not result in an alarm.
- Switch-back delay d_{oF} : An alarm is switched off this time after the temperature is below the limit, e.g. a cooling fan can cool down a transformer for this additional time to ensure, that it needn't be started again after a short time.
- Function of relays:
 - r -closed-circuit current mode, relay is picked up in GOOD condition (=limit not exceeded) and releases when the limit is reached. Advantage: Errors and malfunctions will normally result in an alarm. Disadvantage: with switched off device and shortly after switching on the supply voltage an alarm is reported. Disadvantageous when the supply-voltage of the device is created by the monitored transformer.
 - R -operating current mode. Relay is released in GOOD condition and picks up when the limit is exceeded. No alarm when supply-voltage is off. This mode is applied normally with heatings, fans or for tripping of transformers.
 - rL/R_L : Alarm switches interlocked. Reset only after the temperature is below the limit (+ hysteresis) and after switching-back delay time has passed.
- Error: At E_{rr}/SE it can be programmed, if the relay switches at troubles (short-circuit or interruption) at a sensor. (or error of device $E_{r3/4}$). Select sensor with $\blacktriangle/\blacktriangledown$. Set \blacktriangleright switches sensor on or off (yellow LED at the sensor input changes). LEDs of activated sensors light up. Leave menu item with button Set \blacktriangleright when SE is in display (on to next menu item). We recommend to program this error message for a pre-alarm (P_{r2} , P_{r3} and P_{r5}) or a relay that is not used for other purposes (P_{r1} and P_{r5}).

9.2.5 LEDs in Programming Mode

Sensor-programming

appropriate LED Alarm is alight

Alarm-programming

appropriate LED Sensor is alight

E_{rr} , Error at Sensor

appropriate LED Alarm is alight

9.2.6 Test Relay (t5t)

At this menu item it can be programmed, that a relay switches after a time don, e.g. 1 week (= 168 hours) for the time doF, e.g. 0.2 h (12 minutes) into alarm state, for starting a pump or a fan for a short time to make them move and thus to ensure, that bearings are not damaged by long lasting times without activity.

Select alarm with ▲/▼. Set ► switches on to don and doF.

don = --- = test not active.

Leave menu item with button Set ► when E is in display.

At programs Pr2 and Pr3 (from firmware -01: Pr2, Pr3 and Pr5) a test is programmed for relay 1 (168h/0,2h).

9.2.7 Sensor Simulation (5i)

At this menu item a sensor can be selected and with the buttons ▲/▼ a measured temperature can be simulated. All functions of the device act as if the temperature was measured in real.

15 minutes after the last button has been pushed, the device automatically returns to normal measuring mode.

9.2.8 Code (Cod)

After setting all parameters they can be protected by activating the code lock.

- After pushing Set ►, the display indicates Pin. Adjust with buttons ▲/▼ Pin 504 (factory setting).
- After pushing Set ►, code lock can be activated or switched off.
- After pushing Set ► again, an individual Pin can be selected (write down).

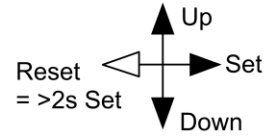
When code lock is activated all parameters can be seen but not be changed anymore.

In case of problems with the code lock (forgotten Pin) the lock can be switched off and the Pin can be set back to 504, by pushing button Set ► while connecting the device to supply-voltage until CodE / oF is indicated in the display.

Hints:

- With programs Pr1 to Pr4 (from firmware -01: Pr1 to Pr5) the most important parameters can be pre-set for various applications. After that only slight changes should be necessary, e.g. setting of the limits for the alarms.
- After a menu-item has been finished, it is automatically switched to the next menu-item. E.g. after programming the combination of sensor and alarm for sensor 1 it is switched to sensor 2 when Set ► is pushed.
- When the right decimal-point in the 7 segment-display is alight, you have left the display-mode and you can select the different menu-items with ▲/▼ (left vertical column in flow chart).
- When the right decimal-point in the 7 segment-display is flashes, you are in a menu-item. Parameters can be changes with ▲/▼ in this mode (right side of flow chart).
- Longer pushing of ▲ or ▼ accelerates the changes in the display.
- Button ▲ and ▼ pushed at the same time sets actual programmed parameter to zero.
- With a reset (push Set/Reset ► for 2 s) you return to display-mode from any position in the programming-mode (last programmed parameter is stored).

Operation with pushbuttons



- 1) Change of sensor-type Temp. / PTC clears association sensors/alarms
- 2) Monitoring of difference in temperature selectable for sensor 3, only when type of sensor 1 and 2 are identical (dif = sensor 2 minus sensor 1)

LEDs on type-plate display appropriate inputs and outputs

menu mode: right decimal-point lights
programming mode: right decimal-point flashes

▲/▼ simultaneously sets value to Zero
Code-Reset = 2s ▶ when switching on device (PIN = 504)

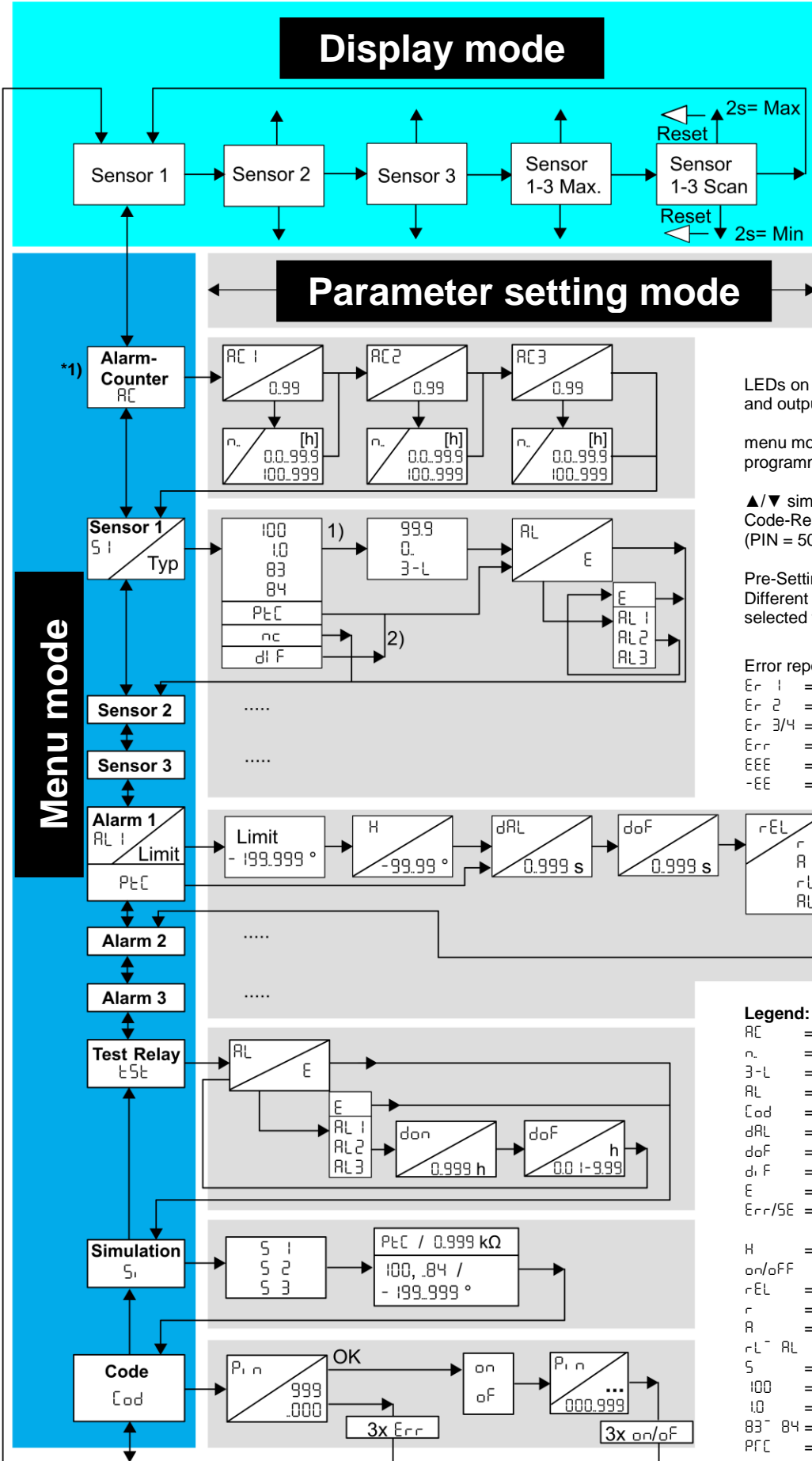
Pre-Settings = 10 s ▶ when switching on device
Different pre-settings and °C / °F / 0.1 °C can be selected factory reset with ▲/▼

Error reports:

- Er 1 = short-circuit in sensor or line
- Er 2 = break of sensor or line
- Er 3/4 = internal error of device
- Err = common error
- EEE = measured values too high
- EE = measured values too low

Legend:

- AC = Alarm counter / Alarm counter 1, 2, 3
- n = number of stored alarm
- 3-L = 3-wire-connection
- AL = alarm (or Relay-function)
- Code = Code (PIN)
- dAL = delay until alarm
- doF = delay until switching back
- d, F = measuring of difference in temperature
- E = exit (leave loop)
- Err/SE = association which relay reports / Sensor Exit
- H = hysteresis
- on/off = on/off
- rEL = function of relay
- r = closed circuit current mode
- R = operating current mode
- rL AL = with locked switching
- S = sensor
- 100 = Pt 100 (RTD-sensor)
- 10 = Pt 1000
- 83 84 = KTY-sensor 83, 84
- PTC = Thermistor
- nc = not connected
- S_i = simulation
- rSt = relay-test, periodical test after time don duration doF (both in hours)
- don = --- = no test



*1) from firmware -03

11 Trouble-shooting and remedies

11.1 Pre-Set ex works (WE)

Press button Set ► for 10 s when switching on supply voltage.

After that, the program "Pr 1... Pr 4" (from firmware -01: Pr 1...Pr 6) can be selected (see "Default-Settings") and temperature display can be changed 1°C <--> 0.1°C <--> °F.

Ex works (factory settings) Pr 1 and 0.1°C are selected.

- **Display of program number** (from firmware -01): Press Set ► for ≥ 4 s in display mode

11.2 Display

EEE sensor interruption or over-range
-EE sensor short circuit or under-range

11.3 Relay cannot be programmed – Code Lock

The Code-lock can be activated as a protection against manipulation of the settings. The user can change the PIN-Code.

You have forgotten the PIN? Make a code-reset by pressing button Set ► for 2 s when switching on supply voltage:

Display: "888"; "Cod"; "°F"; "888". Release button Set ►: Code = off, PIN = 504.

11.4 Displayed Temperature is different from Sensor-Temperature

1. Unit °C / °F correct? When switching on power supply °C / °. °C / °F is displayed for a short moment. Change of unit see "Factory reset".
2. Check connected types of sensors and programmed types

11.5 Display Error „Er 1 or Er 2“

Er 1 Short-circuit in sensor or line

Er 2 Break of sensor or line

Er 3 and Er 4 are internal errors. Switch off and on the device and if necessary reset to one of the programs. If the error cannot be cleared, the relay should be replaced and sent back to the factory.

11.6 Relay trips regularly without limit exceeded

Check if a time "don" is programmed for this relay at Test Relay "tSt".

At Pre-Settings Pr 2 and Pr 3 (from firmware -01: Pr 2, Pr 3 and Pr 6) for relay K1 don = 168 hours for testing an fan once a week.

Remedy: change setting for don to 0.

11.7 Firmware version

Display of firmware version: Press Set ► for 10 s in display mode.

HINT 1: To return to display mode from any position of programming press button Set ► for 2 s (last settings will be stored).

HINT 2: To set the actual programmed parameter to zero (000), press „▲“ and „▼“ simultaneously for 2 s.

12 Technical Data

<u>Rated supply voltage Us:</u>	AC/DC 24 – 240 V
Tolerance	DC 20, 4 - 297 V AC 20 - 264 V 50/60 Hz
Power consumption	< 3 W < 7 VA
<u>Relay output:</u>	3 x co (change-over)
Switching voltage	max. AC 415 V
Switching current	max. 5 A
Switching power	max. 1250 VA (resistive load)
	max. 120 W at DC 24 V
UL electrical ratings:	250 V ac, 5 A, resistive
E214025	240 V ac, 1/2 hp
	120 V ac, ¼ hp
	B 300 – pilot duty, UL 508
Rated operational current Ie:	
AC15	Ie = 3 A Ue = 250 V
DC13	Ie = 2 A Ue = 24 V
	Ie = 0,2 A Ue = 125 V
	Ie = 0,1 A Ue = 250 V
Recommended fuse for contacts	T 3,15 A (gL)
Expected contact life mechanical	3 x 10 ⁷ operations
Expected contact life electrical	1 x 10 ⁵ operations with AC 250 V / 6 A
<u>Test conditions</u>	EN 61010-1
Rated impulse voltage	4000 V
Overvoltage category	III
Contamination level	2
Rated insulation voltage Ui	300 V
On-time	100 %
<u>EMC-tests</u>	EN 61326-1
emitted interference	EN 61000-6-3
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 +/-4 kV
	Impulse 1,2/50 µs (8/20 µs)
discharge of static electricity	IEC 61000-4-2 +/-4 kV contact, +/- 8kV air
<u>Environmental conditions</u>	
Ambient temperature range	-20 °C ... +65 °C
Storage temperature range	-20 °C ... +70 °C
Altitude	Up to 2000 m
Climatic conditions	5 – 85 % rel. humidity, no condensation
External wiring temperature range	-5 °C ... +70 °C
Vibration resistance EN 60068-2-6	2...25 Hz ±1,6 mm 25 ... 150 Hz 5 g

Sensor connection :

Pt 100, Pt 1000 acc. to EN 60751

Sensor	Range °C		Short-circuit Ohm	Break Ohm	Resistance of sensor + line Ohm
	min	max			
Pt 100	-199	860	< 15	> 400	max 500
Pt 1000	-199	860	< 150	> 4000	max 4100
KTY 83	-55	175	< 150	> 4000	max 4100
KTY 84	-40	250	< 150	> 4000	max 4100
PTC			< 20	> 20000 *	
			* when no value 3800 ... 20000 ohm has been measured before		

Accuracy $\pm 0,5\%$ of value $\pm 1\text{ K}$ (KTY $\pm 5\text{ K}$)
 Sensor-current $\leq 1\text{ mA}$
 Measuring time $t_M < 2,5\text{ s}$ (depending on number and type of connected sensors)

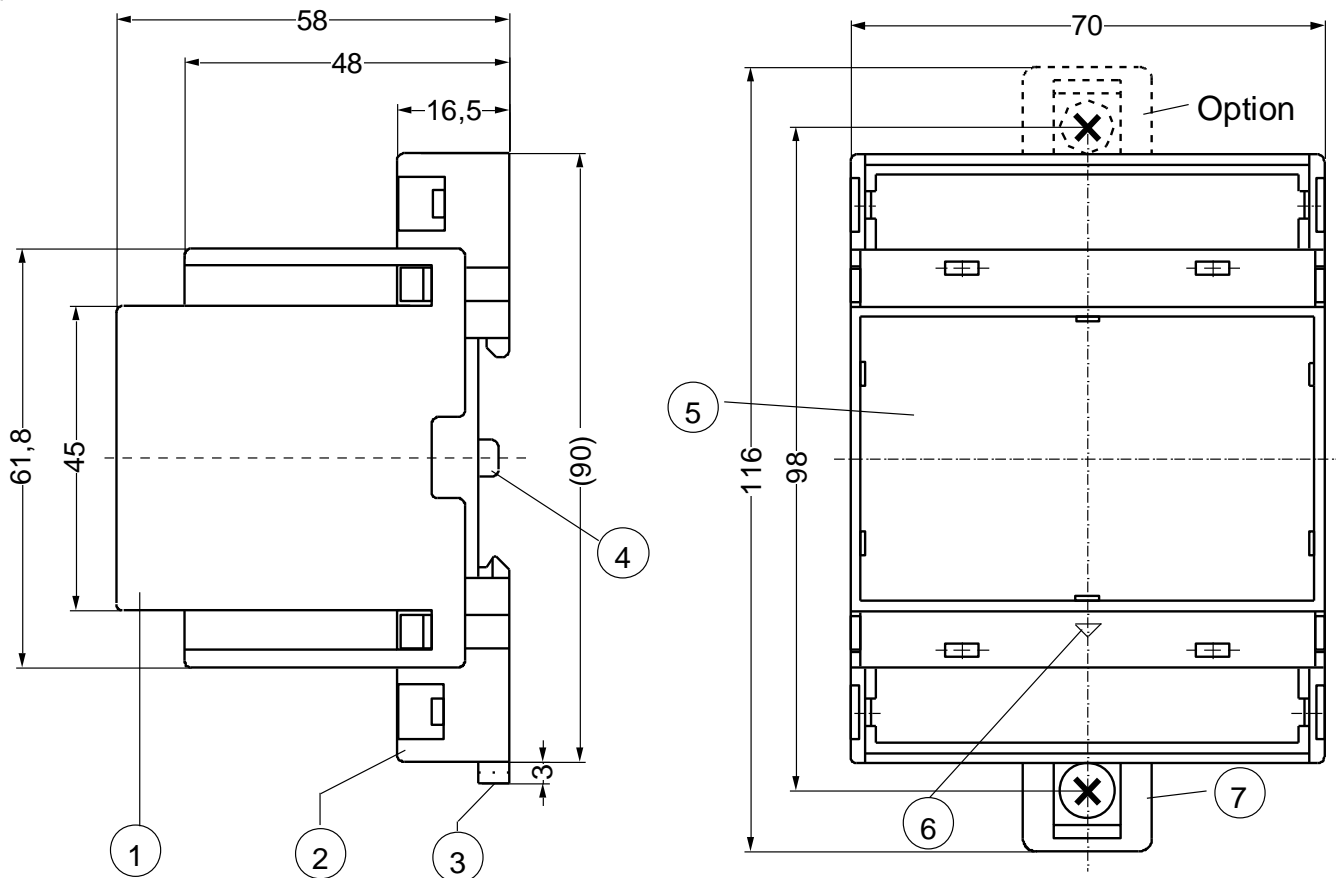
Housing:

type V 4
 Mounting height 55 mm
 Width 4 TE
 Dimensions (W x H x D) 70 x 90 x 58 mm
 Line connection solid wire each 1 x 1,5 mm²
 Stranded wire with insulated ferrules each 1 x 1,0 mm²
 Torque 0.5 Nm (3,6 lb.in)
 Protection class housing IP 30
 Protection class terminals IP 20
 Fitting position any
 Mounting Snap mounting on 35 mm standard rail
 EN 60 715 or M4 screws
 Weight app. 200g

Subject to technical modifications

13 Design V4

dimensions in mm



- 1 Oberteil / cover
- 2 Unterteil / base
- 3 Riegel / bar for snap mounting
- 4 Plomben Lasche / 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.

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