

# Pt100-Temperature-Relay Type TR440

4 Sensors Pt100 (RTD), Monitoring of Core, Panel-Mount

## TR440



### Part numbers:

**T224184**

**T224185** RS485

### Function:

### Temperature-Relay for the protection of transformers from over-temperature and for controlling a fan.

Monitoring of the temperatures in the windings is made with 3 sensors. The input for the 4th sensor can be used for monitoring the temperature in the core or for a sensor for ambient temperature.

The 4 alarms/relay-outputs control the fan and release signals for alarm and trip if limits are exceeded. Different programs allow to adapt the required alarms to the application. Depending on the program e.g. extra alarms for sensor-error or for tripping because of over-temperature in the core are available.

### Other applications:

The forth sensor can be used to monitor the room, in which the transformer is set up and the alarm can control a forced cooling of the room.

The TR440 can also be used for the monitoring of temperatures e.g. at motors.

### Features:

- 4 sensor-inputs Pt 100 (RTD) and Pt 1000
- Sensor-connection in 2- or 3-wire
- Monitoring range -199...+850°C / -199...+999°F
- 4 alarms / relays
- Supply-voltage AC/DC 24-240 V
- Clearly arranged displays and easy programming
- Storing of values of MIN- and MAX-temperature
- Code-lock against unintended / unauthorized manipulations of settings

### Displays:

- 3 digit 7-segment-display
- 4 LEDs for sensor-inputs, LED for sensor-error
- 4 LEDs for alarms
- 4 LEDs for state of relays
- Display in °C or °F

### Switching functions:

- 4 relay-outputs, change-over (co) contacts
- Relay for Fan max. 10 A
- Adjustable (depending of function)
  - Hysteresis 1...99 K
  - Switch- and switch-back-delay 0...999 s
  - Operating- or closed-current mode
  - Autoreset or electronic reclosing lock
  - Cyclic start of fan (K1 only)

### Option:

- Interface RS485 (Modbus RTU)

### Monitoring Programs:

#### 3 sensors in windings:

Alarms/outputs for:

- Fan (with cyclic test)
- Alarm
- Trip
- Sensor-Error

#### 3 sensors in windings and 1 sensor in core:

Alarms/outputs for:

- Fan (with cyclic test)
- Alarm (winding and core)
- Trip (winding and core)
- Sensor-Error

For core and winding different limits can be programmed.

#### 3 sensors in windings and 1 sensor in core:

Alarms/outputs for:

- Fan (with cyclic test)
- Alarm (winding) / sensor-error (combined)
- Trip (winding)
- Trip (core)

Alarm 2 reports sensor-error and alarm

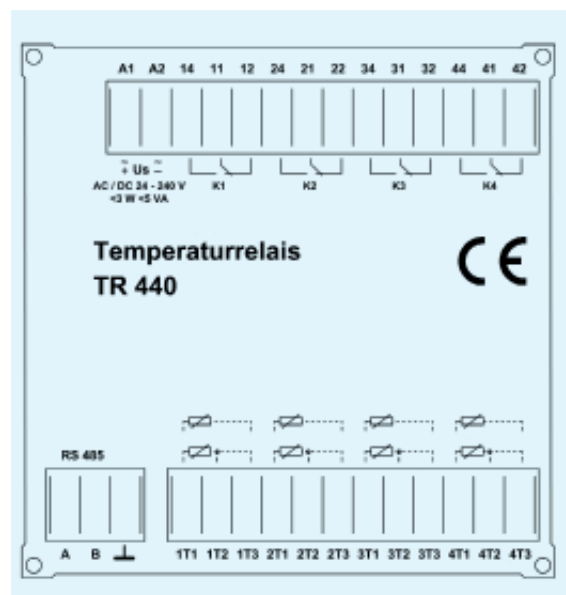
#### 3 sensors in windings and 1 sensor in core:

Alarms/outputs for:

- Trip (core)
- Alarm (winding)
- Trip (winding)
- Sensor-Error

The relay for error (short-circuit or break of sensor-lines) is preset in closed-current mode (alarm also at loss of supply-voltage or failure in the device = monitoring of function of the device). All other relays are in operating-current mode (pick up at an alarm = no alarm when switching on and off supply-voltage). The mode of the relays can be changed by the user.

## Connection plan:



## Technical Data

|                                  |                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------|
| Rated supply voltage $U_s$       | AC/DC 24-240V, AC 20-264 V, DC 20-297 V,                                        |
| Power consumption                | < 3 W, < 5 VA                                                                   |
| Sensor-connection                | 4 x Pt100 (RTD) acc. to EN 60 751/ IEC 60 751                                   |
| Measuring accuracy               | < 1% of value $\pm$ 1 digit                                                     |
| Sensor-current                   | $\leq$ 1 mA                                                                     |
| Connection                       | 2- wire or 3-wire, with line-resistance max. 2 x 50 $\Omega$                    |
| Measuring range                  | -199...850 $^{\circ}\text{C}$ (-199...+999 $^{\circ}\text{F}$ )                 |
| Hysteresis                       | 1...99 $^{\circ}\text{C}$ ( $^{\circ}\text{F}$ )                                |
| Switching-delay on/off           | 0...999 s                                                                       |
| Relay-output                     | Alarm 1 (Fan): 10 A<br>Alarms 2-4: type 3, see "general technical informations" |
| Test conditions                  | see "general technical informations"                                            |
| Rated ambient temperature range  | -40...+65 $^{\circ}\text{C}$                                                    |
| Housing                          | panel-mount 96 x 96 mm                                                          |
| Dimensions (H x B x T)           | 96 x 96 x 85 mm                                                                 |
| Terminals                        | 2 x 13-pole                                                                     |
| Line connection solid wire       | 1 x 0,5 mm <sup>2</sup>                                                         |
| Stranded with insulated ferrules | 1 x 0,14...1,5 mm <sup>2</sup>                                                  |
| Attachment                       | Panel-mount, cutout 92 <sup>+0,8</sup> x92 <sup>+0,8</sup> mm                   |
| Protection housing               | IP 20                                                                           |
| Protection front                 | IP 54                                                                           |
| Protection terminals             | IP 20                                                                           |
| Weight                           | app. 290 g                                                                      |