

Operating Manual TR660IP

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from Firmware: 0-06



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Operating manual, Quick guide, Datasheet, Connection diagram, CAD Data
Firmwareupdates, FAQ, Videos about installation and settings, Certificates

- Pt100, Pt1000, PTC temperature relay with integrated webserver and display

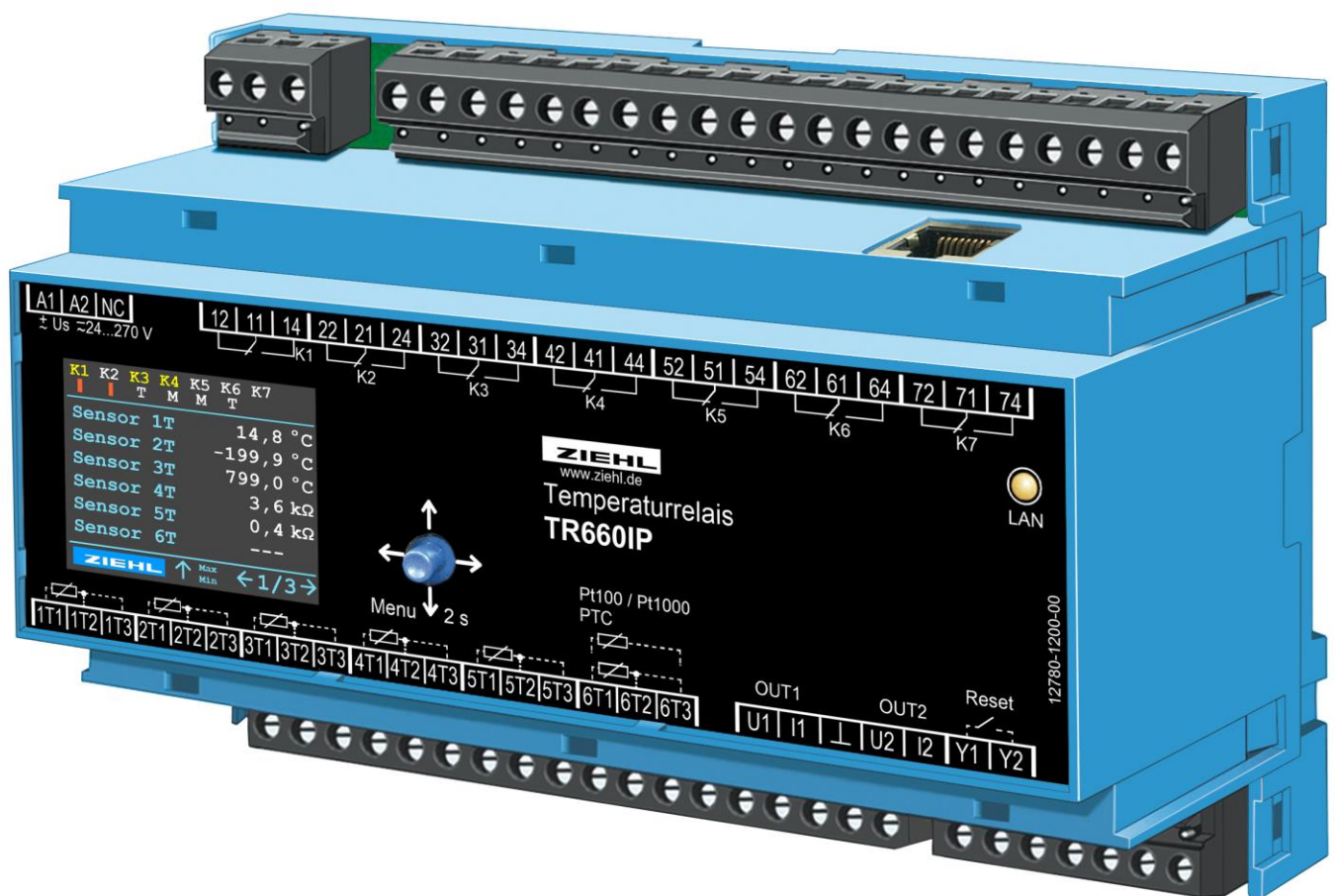


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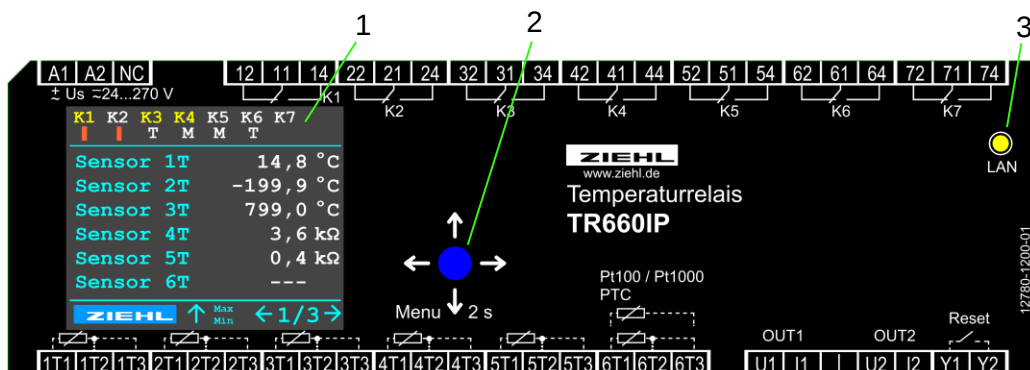
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1 General Notes

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. Display

- K1 ... K7
 - white font => relay released
 - yellow font => relay energized
- coloured bar below the relay name
 - bar increasing => delay alarm on active
 - bar decreasing => delay alarm off active
 - bar flashes red => manual intervention necessary, alarm can be reset (push button up, or external switch on Y1 + Y2)
 - "M" => relay is in manual mode (depending on the colour of the relay name; relay energized (yellow) relay dropped (white))
 - "T" => cyclic relay test active
- When measured value is highlighted in orange
 - sensor value is above the limit value
- **ERR**
 - There is at least 1 error (detailed description of the active error is shown on page 4)

2. Operating element – joystick button

3. LED Ethernet connectivity

3 Pre-sets

The pre-set programs cover most applications. The required program can easily be selected via the menu ([push button down >2s -> programs](#)). Alternatively, the program can be selected via the web server ([page configuration](#)).

4 Application and short description

The TR660IP is used particularly advantageous wherever several Pt100, Pt1000 sensors or PTC thermistors are to be evaluated simultaneously:

- Motors or generators, also with simultaneous monitoring of bearing or e.g. exhaust temperatures
- Transformers, also with additional core temperature monitoring
- Machinery and equipment

Switchgear type TR660IP monitor up to 6 sensors simultaneously. The user can assign several limit values to the 7 output relays almost arbitrarily. The assignment sensor / relay is very variable programmable. Basic settings such as the monitoring of 3 sensors to the same limit with common message (e.g. when used on motors or transformers) can be easily selected via the default configurations.

5 Overview of functions

- All measured values can be read at once
- Easy operation with joystick button
- Measuring and monitoring range Pt100, Pt1000 -199,9 ... +800,0°C, PTC
- 6x sensor inputs (Pt100, Pt1000, PTC), optionally 2 or 3 – wire technology
- 7x relay outputs (1 changeover each)
 - Alarm K1 (11/12/14) ... K7 (71/72/74)
- Fault message for sensor break, short circuit and device fault freely configurable on each of the 7 relays
- Modbus TCP
- Wide range power supply AC / DC 24 – 270V
- Integrated web server for the measurement query, configuration and for firmware updates
- 4x analogue output (2x voltage, 2x current) –**TR660IP Analog only**
- RS485 interface (Modbus RTU) –**TR660IP RS485 only**

Functions / settings

Alarm:

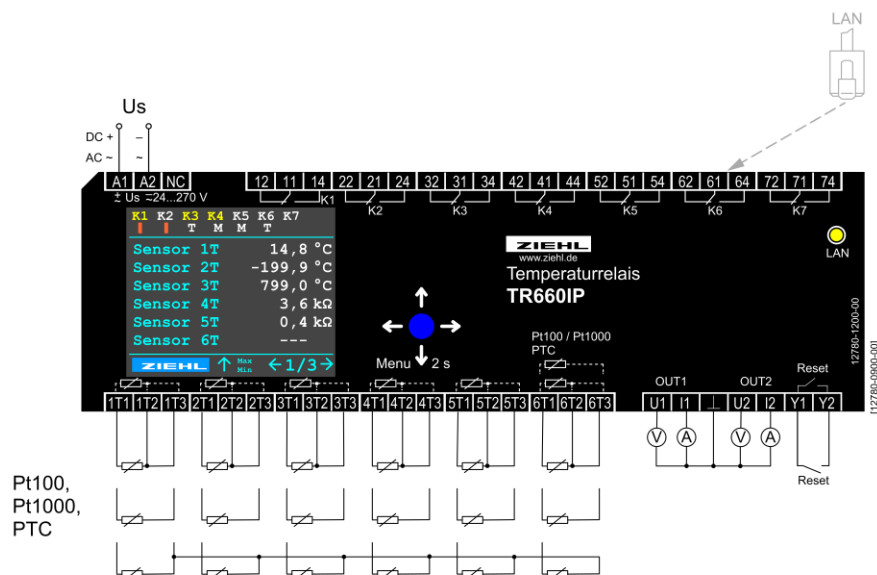
- Each sensor can be assigned to each alarm (relay K1 ... K7).
 - However, only equivalent sensor types can be assigned to the same alarm. That means Pt100 and Pt1000 sensors can be combined, but not PTC at the same time.
 - **Caution! The first parameterized sensor specifies the alarm type (Pt sensor or PTC).**
- For each alarm, sensor fault and device fault can be parameterized
- Free adjustable delay times for “Alarm on” and “Alarm off”
- 2 of x
 - The function “2 of x” triggers the alarm only if at least 2 of the sensors parameterized for this alarm fulfil the alarm conditions
 - If only 1 sensor assigned to an alarm, this function cannot be activated.
- Rate of change of temperature (ROCOT)
 - ROCOT slope (°C / s)
 - If the temperature increase between the measured values is higher than the set slope, the respective alarm switches on. Even if the set “alarm on” temperature has not yet been reached.
 - ROCOT time
 - If the calculated value ((slope * time) + current measured value) exceeds the set switch-off temperature, the alarm switches on.
 - ROCOT switch back conditions
 - Actual measured value must be less than “alarm off” and slope must be negative.
- Locked alarm
 - Each alarm can be set to “locked” yes or no
- Relay function
 - On at alarm
 - Off at alarm
 - Manually on (if a relay is set to “manual”, it permanently retains this state)
 - Manually off

Cyclic relay test

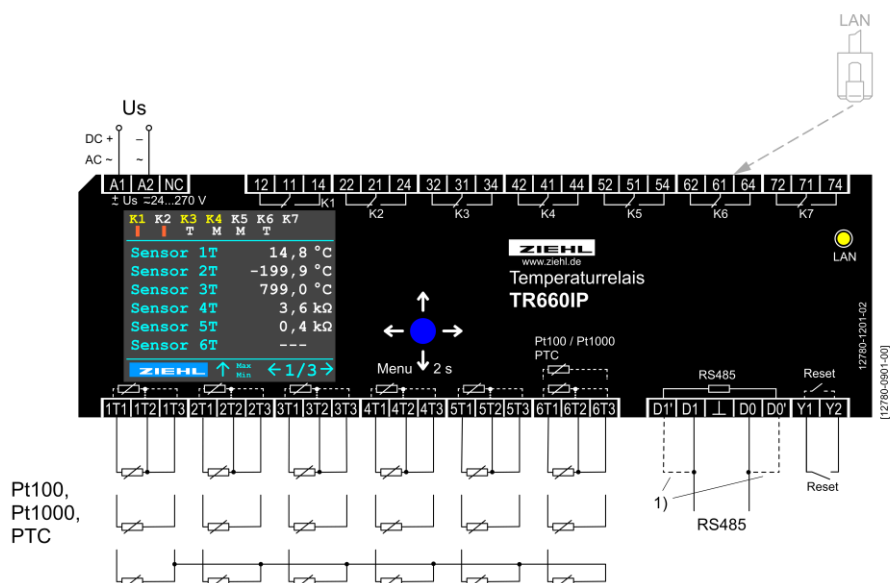
The cyclic relay test is freely adjustable for each relay. It is used on engines for example, to activate fans or pumps in a fixed cycle for the set time, so that they are moved regularly.

6 Connecting diagram

6.1 TR660IP Analog



6.2 TR660IP RS485



CAUTION! For the last device in the RS485 bus, the bridges „1)“ must be screwed in from D1 to D1' and from D0 to D0'. Wire bridges are not included.

6.3 Ethernet

Ethernet socket for network cable.



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.



If the temperature sensors are installed in transformers or motors with a voltage > 300V, they must have a double or reinforced insulation suitable for the measurement.



All wires (sensors, reset, ethernet) that are >30m must be shielded. The shield must be earthed on the side of the device



Reference to isolation of input and output as well as relay contacts: Unless otherwise noted, the devices have basic insulation accordingly the measurement insulation voltage of the device. When higher isolation or safe separation is required for the application, this must be ensured due to additional measures.



Attention!

The temperature sensors are connected to terminals 1T1, 1T2, 1T3 etc.

These pluggable contacts have a special contact material and may only be used for connecting the sensors.

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.

8 Installation

- mount on 35 mm mounting rail according to EN 60715
- wall-mount with 3 x screws M4
- connecting wires refer to the connection plan to prevent miss-operation and malfunction.



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

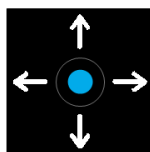
Observe the maximum permissible temperature when installing in the control cabinet. Leave enough space for other equipment or heat sources. If cooling becomes difficult, e.g. by close proximity of devices with increased surface temperature or obstruction of the cooling air flow, the permissible ambient temperature is reduced.

9 Commissioning

9.1 Notes on operation

← **Push Button left...**
Display page: previous display page
Menu: back
Parameter: navigate to the left

↑ **Push Button up...**
Display page 1/3: min/max values
Menu: scroll up
Parameter: increase value
Locked alarm: >2s = reset



→ **Push Button right...**
Display page: next display page
Menu: call submenu / parameter
Parameter: navigate to the right

↓ **Push Button down...**
Display page: Press and hold for 2s, menu is displayed
Menu: scroll down
Parameter: decrease value

9.2 Switch on device / select language and date

When you first start the device, the language selection appears. After the desired language has been selected, the current date and time setting will appear. These settings are required for the correct operation of the alarm counter. If the date has not been set, the alarm counter will show the year 1970. After these settings have been made, the monitoring starts. The settings for the language, date and time can be changed at any time in the menu ([settings](#) -> [language](#) / [date](#) / [time](#)) or via web browser.

9.3 Device on the network

If the TR660IP is connected to a network via Ethernet, the measured values and parameterization can be made via the web browser on a computer. Basic knowledge of network technology is required for the configuration.

9.3.1 Find the device in the network

Network with DHCP server

After connecting to the network, the device automatically receives an IP address.

Query IP address on the device:

- In menu mode, select the menu item “network” or on the 3rd display page
- Settings for the network parameters DHCP, IP address and subnet mask can be viewed and changed.

Set network without DHCP server / manual IP address

The relevant network parameters can be set and changed directly on the device:

- In menu mode, select the menu item “network”
- Settings for the network parameters:
 - Set DHCP to “off”
 - Set the IP address and subnet mask

Connection

Start the web browser on computer and insert the IP address in the address bar.

9.3.2 Call via web browser

After calling the IP address, the device logs in the web browser.

9.4 Wire line adjustment

To compensate the line resistance short circuit the wires nearby the sensor, measure resistance and enter this value for 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 RK must be calculated as follows:

$RK = (n+1) \times RL/2$ (RL = resistance of two wires, n = number of sensors)

10 Operation

10.1 Program selection

Depending on the application, a program with the appropriate default settings can be loaded on the TR660IP. Settings procedure on the device: [push button down >2s -> programs -> select application area -> select program](#).

Setting procedure via web browser: [page "configuration" -> select suitable program from dropdown menu -> by clicking on "save" the selected program is loaded](#).

Pr	Description	sensors	alarms
1.00	Trafo save 3x Pt100 same settings as Pr2 TR250	1T = Pt100 2T = Pt100 3T = Pt100 4T = off 5T = off 6T = off	K1 = fan with cyclic test K2 = pre-alarm K3 = tripping K4 = sensor-/ device error
1.01	Trafo save 1x Pt100, 2x PTC same settings as Pr3 TR250	1T = Pt100 2T = PTC 3T = PTC 4T = off 5T = off 6T = off	K1 = fan with cyclic test K2 = pre-alarm K3 = tripping K4 = sensor-/ device error
1.02	Trafo save 4x Pt100 same settings as Pr3 TR440	1T = Pt100 2T = Pt100 3T = Pt100 4T = Pt100 5T = off 6T = off	K1 = fan with cyclic test K2 = pre-alarm + error K3 = tripping winding K4 = tripping core
1.03	Trafo save 4x Pt100 same settings as Pr4 TR440	1T = Pt100 2T = Pt100 3T = Pt100 4T = Pt100 5T = off 6T = off	K1 = core K2 = pre-alarm K3 = tripping winding K4 = sensor-/ device error
1.04	Trafo save 4x PTC same settings as Pr1 MSF220VL	1T = PTC 2T = PTC 3T = PTC 4T = PTC 5T = off 6T = off	K1 = fan with cyclic test K2 = pre-alarm + error K3 = tripping winding K4 = tripping core
1.05	Trafo save 3x PTC same settings as Pr2 MSF220VL	1T = PTC 2T = PTC 3T = PTC 4T = off 5T = off 6T = off	K1 = pre-alarm K2 = tripping winding K3 = tripping core K4 = sensor-/ device error
1.06	Trafo save 3x PTC same settings as Pr3 MSF220VL	1T = PTC 2T = PTC 3T = PTC 4T = off	K1 = fan with cyclic test K2 = pre-alarm K3 = tripping winding K4 = sensor-/ device error

		5T = off 6T = off	
2.00 *)	Motor save 3x Pt100 same settings as Pr1 TR250	1T = Pt100 2T = Pt100 3T = Pt100 4T = off 5T = off 6T = off	K1 = pre-alarm K2 = tripping K3 = sensor-/ device error K4 = not used
3.00	other... 6x Pt100 Single allocation	1T = Pt100 2T = Pt100 3T = Pt100 4T = Pt100 5T = Pt100 6T = Pt100	K1 = sensor 1T K2 = sensor 2T K3 = sensor 3T K4 = sensor 4T K5 = sensor 5T K6 = sensor 6T K7 = sensor-/ device error
3.01	other... 6x PTC Single allocation	1T = PTC 2T = PTC 3T = PTC 4T = PTC 5T = PTC 6T = PTC	K1 = sensor 1T K2 = sensor 2T K3 = sensor 3T K4 = sensor 4T K5 = sensor 5T K6 = sensor 6T K7 = sensor-/ device error
3.02	other... 6x Pt100	1T = Pt100 2T = Pt100 3T = Pt100 4T = Pt100 5T = Pt100 6T = Pt100	K1 = sensor 1T, 2T, 3T K2 = sensor 1T, 2T, 3T K3 = sensor 4T, 5T K4 = sensor 4T, 5T K5 = sensor 5T K6 = sensor 6T K7 = sensor-/ device error

Tip: When a program is changed, all parameters are reset to “Factory setting” of the selected program. The network settings are retained after a program change. **Do not change the parameters until you have selected the correct program.**

*) default setting

10.2 Description of the parameters

menu	parameter	explanation	setting
program	Preset programs for the areas: 1. Trafo-safety, 2. Motor-safety, 3. others...	Load predefined programs for fast and comfortable setting of the TR660IP	-
sensors 1T ... 6T	type	Setting the respectively connected sensor type	off, Pt100, Pt1000, PTC
	Line-resistance	Line-resistance between device and sensor. Setting in ohms, or as 3-wire with automatic compensation of cable resistance.	3- wire, 0,0 ... 100,0 Ω
Alarm K1 ... K7	Sensors	Assignment of which sensors acts on this alarm.	1T ... 6T
	2 of x	If this function is on, 2 of the assigned sensors must meet the alarm conditions to trigger the alarm. Function can only be activated if 2 sensors are assigned to this alarm.	on, off
	alarm on	Temperature value at which the alarm is triggered. If a PTC is assigned to the alarm, fixed switch-off values for PTC thermistors are used.	-199,9 ... 800,0 $^{\circ}\text{C}$
	alarm off	Temperature value at which the alarm is switches back. If a PTC is assigned to the alarm, fixed reset values for PTC thermistors are used.	-199,9 ... 800,0 $^{\circ}\text{C}$
	Delay alarm on	Delay time between reaching the alarm on value and switching the relay.	00:00 ... 59:59 mm:ss
	Delay alarm off	Delay time between reaching the alarm off value and switching the relay.	00:00 ... 59:59 mm:ss
	Relay function	Function how the relay should behave in case of an alarm	On at alarm, off at alarm, manually on, manually off
	Alarm locked	If the function is activated, the alarm must be switched back manually on the device, via the web browser or via an external switch on Y1 + Y2.	on, off
	Sensor error	Selection of sensors for which the relay issues a fault message in the event of a sensor error.	1T ... 6T
	Device error	Activation to report a device error with this relay.	on, off
	ROCOT	Function for switching off at rapid temperature rise. (see ROCOT)	off, $^{\circ}\text{C/s}$, time
	ROCOT [$^{\circ}\text{C/s}$]	Parameterization of the line slope between two measured values.	0,1 ... 10,0 $^{\circ}\text{C/s}$
	ROCOT [Zeit]	Setting the calculation time for the ROCOT time shutdown	00:10 ... 20:00 mm:ss
Cyclic test K1 ... K7	Cyclic test	Activation of the cyclic relay test	on, off
	Delay on	Duration after which time the cyclic test is repeated	00-01 ... 90-00 dd-hh

	Time on	Duration for which the test is active	00:01 ... 23:59 hh:mm
Analog-output (TR660IP Analog only)	OUT 1 voltage	range	0 ... 10V 2 ... 10V
		Sensors that act on this analogue output	1T ... 6T
		Temperature output	Min. temperature, max. temperature
		Zero	-199,9 ... 800,0 °C
		Fullscale	-199,9 ... 800,0 °C
	OUT 1 current	range	0 ... 20mA 4 ... 20mA
		Sensors that act on this analogue output	1T ... 6T
		Temperature output	Min. temperature, max. temperature
		Zero	-199,9 ... 800,0 °C
		Fullscale	-199,9 ... 800,0 °C
	OUT 2 voltage	range	0 ... 10V 2 ... 10V
		Sensors that act on this analogue output	1T ... 6T
		Temperature output	Min. temperature, max. temperature
		Zero	-199,9 ... 800,0 °C
		Fullscale	-199,9 ... 800,0 °C
	OUT 2 current	range	0 ... 20mA 4 ... 20mA
		Sensors that act on this analogue output	1T ... 6T
		Temperature output	Min. temperature, max. temperature
		Zero	-199,9 ... 800,0 °C
		Fullscale	-199,9 ... 800,0 °C
RS485 – Modbus (TR660IP RS485 only)	BUS address	Bus address of the TR660IP	001 ... 247
	Baud rate	Communication speed	4800, 9600, 19200, 57600
	Parity	Parity bit	No, odd, even
	Stop Bits	Number of stop bits	1 ... 2
Network	DHCP	Dynamic Host Configuration Protocol (DHCP) The device gets its IP address from the server	on, off
	IP-address	Manual setting of the IP address in the network	
	Subnet mask	Manual setting of the subnet mask	
Settings	Language	Setting of the language of the display	German, English
	Date	Setting the current date	
	time	Setting the current time	
	Display interval	Duration to update the display	0,1 ... 2,0 s
	Brightness	Display brightness	20 ... 100%
	Dimming time	Duration until the display brightness is reduced	00:10 ... 59:59 mm:ss
	Factory settings	Load the parameters of the current active program	no, yes
	Code protection	Code protection so that the settings can be protected Factory setting: 504	on, off
Simulation	Sensors	Simulation of a single sensor value	
	Relay	Simulation of a single relay state	

Info	Firmware version	Display of the current installed firmware version	
	Serial number	Display the serial number	
	Operating hours	Operating hours of the device	
	Comment	Comment of the customer (setting via web browser only)	
Counter	alarm counter	Alarm counter for each alarm	last 20 alarms
	statistic 1	Sensor statistic (resettable)	
	statistic complete	Sensor statistic (not resettable)	
	reset	Deleting the alarm counter and sensor statistic 1	

10.3 Code lock / code reset

The device can be protected with the code lock against unauthorized changes to the device (via joystick button) ([menu](#) -> [settings](#) -> [code lock](#)). A pin code is used for this (**factory setting: 504**).

Reset pin code / disable code lock,
On the device:

- Switch off the supply voltage
- Push the joystick button up (and keep it pressed)
- Switch on the supply voltage (keep the button pressed)
- After approx. 4s, the reset menu appears, select the code lock and push the button to the right
- Code lock is off, pin code is reset to = 504

Via web interface:

- Open the page system, deactivate code lock and save it with a push on the save button.

10.4 Description of the display pages

10.4.1 Measured value page (1/3)

K1	K2	K3	K4	K5	K6	K7	
1T	Sensor				14.8	°C	
2T	Sensor				790.2	°C	
3T	Sensor				-199.0	°C	
4T	Sensor				3.6	kΩ	
5T	Sensor				0.4	kΩ	
6T	Sensor				---		
Reset ↑ 2s ↑ Max Min ← 1/3 →							

- Measurements of all 6 sensors at a glance
- Sensor names (7 characters) can be set via web interface
- If a measured value triggers an alarm, it receives a coloured background
- Pt100, Pt1000 sensors can be recognized by the unit „°C“
- PTC thermistors can be recognized by the unit „kΩ“
- Is one of the following signs used instead of the measured value:
 - „---“ is displayed, the sensor is deactivated
 - „>>>“ or „<<<“ is displayed, the current measured value is larger or smaller than the measuring range
- Joystick button
 - Push short upwards => display page for min. / max. values
 - In the case of a backshift ready locked alarm, push the button 2s upwards to reset the alarm.

10.4.2 Sensor to alarm assignment (2/3)

	1T	2T	3T	4T	5T	6T	Al ein
K1	X		X				20°C
K2		X					-180.0°C
K3			X	X			910.8°C
K4							PTC
K5			X				PTC
K6					X		120.0°C
K7							
ZIEHL ← 2/3 →							

- Tabular assignment of the sensors to the alarms
- X (white) => sensor acts on alarm,
- X (orange) => sensor has exceeded limit,
- R (red) => sensor triggered alarm by the ROCOT function,
- 2 (orange) => two sensors triggered alarm by the function „2 of x“
- E (red) => sensor error (short circuit or sensor break)
- Alarm state of the relays can be seen
- (Kx (white) => relay dropped, Kx (yellow) => relay energized)
- Set alarm limit

10.4.3 Info page (3/3)

10.4.3.1 TR660IP Analog

K1	K2	K3	K4	K5	K6	K7
■	■	■	■			
Firmware			0-00			
Programm Nr.			1.00			
Reset Y1/Y2			0			
IP-Adr.			192.168.7.254			
Out U1 U2		6,2V		7,9V		
Out I1 I2		2,5mA		16,8mA		

ZIEHL ← 3/3 →

- Currently installed firmware version
- Currently selected program
- Reset input 0 = open, 1 = closed
- Current IP-address of the device
- Actual voltage- / current values of the analogue outputs

10.4.3.2 TR660IP RS485

K1	K2	K3	K4	K5	K6	K7
■	■	■	■			
Firmware			0-00			
Programm Nr.			1.00			
Reset Y1/Y2			0			
IP-Adr.			192.168.7.254			
RS485			Rx / Tx		●	

ZIEHL ← 3/3 →

- Currently installed firmware version
- Currently selected program
- Reset input 0 = open, 1 = closed
- Current IP-address of the device
- Activity on the RS485 bus (yellow dot flickering)

10.5 Special functions

10.5.1 2 of x

For each alarm the function “2 of x” can be activated. That is at least two of the sensors associated with the alarm must meet the conditions for the alarm to trigger the alarm.



- To activate the function, there must be min. two sensors parametrised for the desired alarm.
- Sensor errors are ignored. If only 2 sensors are assigned to a “2 of x” alarm and one of these sensors has a sensor error (short-circuit or interruption), it is no longer possible to trigger an alarm. In this case, monitor the sensors for errors on another alarm.

10.5.2 Rate of change of temperature (ROCOT)

The ROCOT function sets a new average every 10s. The slope is calculated from the actual and the previous average.

10.5.2.1 Slope (°C / s)

If the calculated slope is greater than the set value, the alarm becomes active.

10.5.2.2 Time (s)

Alarm if the set limit value would be reached at the same slope after the set time. In the time function, the calculated slope is multiplied by the set time. The current measured value is then added to this value. If the result is greater than the set alarm value for “alarm on”, the alarm is triggered.

10.5.2.3 Backshift conditions

If a ROCOT alarm is active, two conditions must be met for the alarm to go back.

- The current measured value must be smaller than the switch-off value for “alarm off”
- The calculated slope must be negative

If both conditions are fulfilled, the alarm switches off again.

10.5.3 Cyclic relay test

For each alarm, a “cyclic relay test” can be activated. This switches the relay according to the set parameters. The cyclic switching ensures a longer service life of pumps and motors, which are normally never in operation. This prevents a defect (sticking due to corrosion, ...) on the connected pumps or motors.

10.5.4 Differential temperatures

With the TR660IP a difference between 2 sensors can be calculated. The two next smaller measuring inputs are always used for the source sensors. For example, if you want to calculate a difference on measurement input 4, sensor 3T – sensor 2T is used.

10.5.4.1 Differential temperatures

Each sensor can be parameterized to the type of difference (Diff xT-yT). This measurement input thus calculates the difference between the two sensors displayed.

10.5.4.1 Differential temperatures absolute

With the absolute difference measurement, only the difference between the two selected sensors is formed. The result is always a positive value.

10.6 Simulation

If required (commissioning, troubleshooting, ...), individual functions (sensor values, relay states) can be simulated. The simulation can be started either directly on the device ([menu -> simulation](#)) or via the web interface ([home -> start simulation](#)). The simulation mode is active for 15 min from the last action, or can be shut down directly by the user.

10.7 Firmware update

Firmware updates can be installed via the web browser ([system](#)). If the update notification is active, a message is displayed as soon as a new firmware version is available. If the device is not connected to the internet, the new firmware can be downloaded from the homepage www.ziehl.com. Then the update file can be selected under ([system -> manual installation -> select firmware](#)) and carried out via the button "manual update installation".

10.8 Alarm counter

There are separate alarm counters for each alarm. These alarm counters store the last 20 shutdowns with cause and timestamp. If, instead of the correct time, a date around 1970 is displayed, the set date + time of the real-time clock is not correct. For help see 0.

10.9 Logging

10.9.1 Intervall-Logging

Ring memory for 3014 logs possible, max. Logging time depending on the set interval

interval	Logging duration in days and hours	
10s	0d	8:24h
1min	2d	2:12h
10min	20d	22:18h
1h	125d	14:00h

10.9.2 Event-Logging

Ring memory for 510 Logs possible, always logged when a relay changes state. The following data is logged at this time:

- time UTC + local time
- current sensor values (each sensor individually)
- current alarm state (each alarm individually)
- current relay status
- simulation
- Error messages

11 Web interface

If the device is connected to an Ethernet network, it can be parameterized conveniently via a web browser on a computer.

11.1 Home

Status displays from

- Sensors
 - min. / max. values
 - Alarm condition
- Alarms
 - Value for „alarm on“
 - active delay times

- Relay values

Individual values are hidden if the corresponding functions are not active.

11.1.1 Simulation

- Simulation of:
 - Sensors = on/off
 - Sensors = measurement values
 - Relay = on/off

11.2 Configuration

Setting of the function parameters, description see "Factory settings of the programs"

11.3 System

- Device Name (appears in the header of the website)
- Version information (see "Factory settings of the programs")
- LCD Display setting (see "Factory settings of the programs")
- Code protection (see "Factory settings of the programs")
- Firmware update TR660IP
 - Update notification (message if update is available)
 - Firmware status, if necessary, the firmware update can carry out via the update button
 - manual update installation:
 - select firmware (select downloaded firmware)
 - manual update installation (selected firmware will upload and install)
- program update / add new programs
 - all currently installed programs are checked for the current version and can be updated if necessary
 - new programs can be installed on the TR660IP
- Configuration (recent changes to the device are saved with the date / time and the username, see user management)
 - Save configuration (download the system configuration, to save and transfer to other devices)
 - Load configuration (load a saved configuration into the device and activate it). An activated user administration is deactivated in the process. No passwords are transmitted.
- Reset to default
 - Set factory reset (optionally with/without network parameters)
 - Reboot

11.4 Network

- Network settings
- Modbus settings (Modbus TCP protocol on port 502)
- Time server settings and time zone settings (for the current time in the device, important to be able to evaluate the error memory in the device)

11.5 User

- User administration (provide device with read and write rights for users in the network)
- User (activate user and create name and password)
 - Guest username at login (fixed, cannot be changed): „gast“, „Gast“, „guest“, „Guest“ or leave blank
- User permissions (determine which users have which rights on which pages)

Attention: Changes (also to passwords) are only accepted after saving (Save button).

11.5.1 User, admin forgot your password

Deactivate user administration on the device

- Switch the device off and on again while pressing the joystick button up (↑) until "Reset" appears in the display
- Select user administration → and switch off

11.6 Logging

- Interval logging
 - Storage of all measurement / status values at the set interval
- Event logging
 - Storage of all measurement / status values when changing the status of one or more alarms

11.7 Counter

- Alarm counter
 - Recording of the last 20 alarms per relay with time stamp and alarm cause
- Temperature statistics
 - Recording of the temperature distribution over 22 clearly defined temperature ranges in the range from $\leq 0^{\circ}\text{C}$ bis $\geq 200^{\circ}\text{C}$. These statistics can be used, for example, to monitor the utilization of a transformer.
- Operating hour

Error search.

11.8 Temperature statistic

The temperature statistic records the residence time of the respective sensor at a certain temperature. There are 20 predefined temperature ranges (10°C each, e.g. $0,0 \dots 9,9^{\circ}\text{C}$) from $0,0$ up to $199,9^{\circ}\text{C}$. In addition, there is an area for $<0,0^{\circ}\text{C}$ and one for $>200,0^{\circ}\text{C}$. This statistic is available twice resettable via manual reset (or by program change) and cumulated (reset only at program change or set of factory settings).

11.9 Program update

The preinstalled programs can also be updated if necessary. If a newer version is available, it will be displayed in the program table. Here it is directly possible to install the revised version. You can also add new programs via this function.

11.10 Modbus

All devices of type TR660IP have a Modbus TCP interface. The TR660IP RS485 also has a Modbus RTU interface. For more information, see the Modbus operating manual.

11.11 Logging

11.11.1 Intervall-Logging

Ring memory for 3014 logs possible, max. Logging time depending on the set interval

interval	Logging duration in days and hours	
10s	0d	8:24h
1min	2d	2:12h
10min	20d	22:18h
1h	125d	14:00h

11.11.2 Event-Logging

Ring memory for 510 Logs possible, always logged when a relay changes state. The following data is logged at this time:

- time UTC + local time
- current sensor values (each sensor individually)
- current alarm state (each alarm individually)
- current relay status

- simulation
- Error messages

12 Web interface

If the device is connected to an Ethernet network, it can be parameterized conveniently via a web browser on a computer.

12.1 Home

Status displays from

- Sensors
 - min. / max. values
 - Alarm condition
- Alarms
 - Value for „alarm on“
 - active delay times
 - Relay values

Individual values are hidden if the corresponding functions are not active.

12.1.1 Simulation

- Simulation of:
 - Sensors = on/off
 - Sensors = measurement values
 - Relay = on/off

12.2 Configuration

Setting of the function parameters, description see "[Factory settings of the programs](#)"

12.3 System

- Device Name (appears in the header of the website)
- Version information (see "[Factory settings of the programs](#)")
- LCD Display setting (see "[Factory settings of the programs](#)")
- Code protection (see "[Factory settings of the programs](#)")
- Firmware update TR660IP
 - Update notification (message if update is available)
 - Firmware status, if necessary, the firmware update can carry out via the update button
 - manual update installation:
 - select firmware (select downloaded firmware)
 - manual update installation (selected firmware will upload and install)
- program update / add new programs
 - all currently installed programs are checked for the current version and can be updated if necessary
 - new programs can be installed on the TR660IP
- Configuration (recent changes to the device are saved with the date / time and the username, see user management)
 - Save configuration (download the system configuration, to save and transfer to other devices)
 - Load configuration (load a saved configuration into the device and activate it). An activated user administration is deactivated in the process. No passwords are transmitted.
- Reset to default
 - Set factory reset (optionally with/without network parameters)
 - Reboot

12.4 Network

- Network settings
- Modbus settings (Modbus TCP protocol on port 502)
- Time server settings and time zone settings (for the current time in the device, important to be able to evaluate the error memory in the device)

12.5 User

- User administration (provide device with read and write rights for users in the network)
- User (activate user and create name and password)
 - Guest username at login (fixed, cannot be changed): „gast“, „Gast“, „guest“, „Guest“ or leave blank
- User permissions (determine which users have which rights on which pages)

Attention: Changes (also to passwords) are only accepted after saving (Save button).

12.5.1 User, admin forgot your password

Deactivate user administration on the device

- Switch the device off and on again while pressing the joystick button up (↑) until “Reset” appears in the display
- Select user administration → and switch off

12.6 Logging

- Interval logging
 - Storage of all measurement / status values at the set interval
- Event logging
 - Storage of all measurement / status values when changing the status of one or more alarms

12.7 Counter

- Alarm counter
 - Recording of the last 20 alarms per relay with time stamp and alarm cause
- Temperature statistics
 - Recording of the temperature distribution over 22 clearly defined temperature ranges in the range from $\leq 0^{\circ}\text{C}$ bis $\geq 200^{\circ}\text{C}$. These statistics can be used, for example, to monitor the utilization of a transformer.
- Operating hour

13 Error search

Error	Root cause	Help
Relay always switches after a fixed time interval	Cyclic relay test is activated	Deactivate cyclic relay test
Relay does not turn on or off when an alarm is reached	Relay has been parameterized to “manual on” or “manual off”. The display shows below the respective relay an “M”.	Change relay setting (menu -> alarm -> relay function)
The alarm counter displays a date in the range of 1970. In the display (footer) appears again and again „no time“	When starting the device, no correct date / time was set.	- Set time and date correct (menu -> settings -> date / time) - Via Web interface (network) activate a time server or change settings manual
The display shows $\infty\Omega$ instead of the measured value	The associated sensor has a sensor break in one or more wires	Check sensor wires and replace if necessary

	2-wire Pt100 / Pt1000 sensor connected and 3-wire set in the configuration	Check sensor. Change setting to 2-wire with associated line resistance.
The display shows 0Ω instead of the measured value	The associated sensor has a sensor short circuit between 2 wires.	Check sensor wires and replace if necessary
Display shows nothing	- Supply voltage not connected - Fuse has tripped - Device has an internal defect	- Connect supply voltage - Replace fuse - Send in the device for repair
„>>>“ or „<<<“ is displayed instead of the measured value	Sensor value is greater (800°C) or less (-200°C) than measuring range	Check sensor and replace if necessary
Display is too dark	The display is dimmed after the set time (menu -> settings -> dimming time), the set brightness is too low (menu -> settings -> brightness)	Increase the dimming time (menu -> settings -> dimming time), increase the display brightness (menu -> settings -> brightness)
Device cannot be parameterized The display shows “code lock” for each parameter	Code lock active	In case of problems with the code lock (code forgotten), the protection can be switched off and the code can be reset to 504 by keeping the button pressed up (approx. 5s) when switching on the supply voltage. Now the code lock can be reset.
No access via ethernet	DHCP is on, but no IP address has been assigned	Check the DHCP server or set a manual IP address
	Invalid network area	Check the address range of the IP address and the subnet mask
No parameters can be changed via the browser	User administration active and no write access for current user available	Assign write rights to the current user or disable user administration. If the admin password is not known, the user administration can be deactivated on the device. Disconnect the device from the supply voltage, push the button up, connect the supply voltage and hold the button (approx. 5s), reset the user administration.
Signal on analogue output 0 ... 10V => 0V, 2 ... 10V => <=1,8V, 0 ... 20mA => 0mA, 4 ... 20mA => <=3,6mA	Sensor short circuit of an associated sensor	Check sensors and repair short circuit
Signal on analogue output 0 ... 10V => 11V, 2 ... 10V => 11V, 0 ... 20mA => 22mA, 4 ... 20mA => 22mA	Sensor break of an associated sensor	Check sensors and repair sensor break

14 Disposal



Disposal should be carried out properly and in an environmentally friendly manner in accordance with legal provisions.
ZIEHL is registered with the EAR Foundation under WEEE no.: DE 49 698 543.

15 Technical data

Supply voltage U_s :		DC/AC 24 ... 270 V, 0/50/60 Hz			
Tolerance		DC 20,4 ... 297 V	AC 20 ... 297 V		
Power consumption		< 6 W	< 12 VA		
Relay outputs K1 ... K7 (alarm 1 ...7)		Change over			
Switching voltage		max. AC 300 V; DC 300 V			
Inrush current normally open (NO)		AC 15 A 4s 10% ED			
Min. voltage / current		12 V 10 mA			
Conventional thermal current I_{th}		max. 5 A			
Switching power max. AC $\cos \varphi = 1$		2000 VA			
Switching power max. DC (ohm)		0,3 A 300 V; 0,4 A 120 V; 0,8 A 60 V; 8 A 30 V			
Contact service life, electrical $\cos \varphi = 1$		$\cos \varphi = 1 \rightarrow 5 \times 10^5$ operations at 250 V / 2 A			
Contact service life, mechanical		3×10^7 operations			
Short circuit strength (NO)		4 A sluggish or circuit breaker B4			
Short circuit strength (NC)		3,15 A sluggish			
Rated operational current		AC-15	$I_e = 3$ A $U_e = 250$ V		
		DC-13	$I_e = 2$ A $U_e = 24$ V		
		DC-13	$I_e = 0,4$ A $U_e = 120$ V		
		DC-13	$I_e = 0,2$ A $U_e = 240$ V		
UL electrical ratings		250 V ac, 3 A, general use			
		240 V ac, 1/4 hp, 2.9 FLA			
		120 V ac, 1/10 hp, 3.0 FLA			
		C300			
External inputs		approx. DC 18 V / 3,5 mA			
Reset input Y1/Y2		Reset of locked alarms (dynamic)			
Sensor inputs		Pt100, Pt1000 after EN60751			
	Measuring range °C		Short circuit in ohms	Sensor break in ohms	Sensor resistance + line resistance
sensor	min.	max.	<	>	max
Pt100	-199,9	800,0	15	400	500
Pt1000	-199,9	800,0	150	4000	4100
PTC			20	20000 *	
*if no value between 3800 and 20000 ohms was measured before					
Tolerance Pt100, Pt1000		$\pm 0,5\%$ from measuring value $\pm 1K$			
Tolerance PTC		$\pm 0,5\%$ from measuring value $\pm 5\Omega$			
Sensor current		≤ 1 mA			
Measuring cycle / measuring time t_m		<1 s (depending on the number and type of connected sensors)			
Analogue output (only TR660IP Analog)		U1, U2, I1, I2			
Voltage output		DC 0/2 ... 10V			
accuracy		0,3% of full scale (ab 0,1V)			
Temperature drift		< 0,01% / K			
resolution		11,6 Bit <3,1mV			
burden		≥ 1 k Ω			
Current output		DC 0/4 ... 20mA			
accuracy		0,3% of full scale (ab 0,1mA)			
Temperature drift		< 0,015% / K			
resolution		11,6 Bit <6,1mV			
load		$\leq 500 \Omega$			
Error load		$(250 \Omega - \text{load}) / 250 \Omega * 0,3\%$ of current			

RS485 interface (only TR660IP RS485)	
Protocol	Modbus RTU
Address / bus number	1 ... 247
Baud rate	4800, 9600, 19200, 57600
Parity	No, odd, even
Stop bit	1 ... 2
Test conditions	
	EN 61010-1
Rated impulse withstand voltage	4000 V
Overvoltage category	III
Pollutions degree	2
Rated insulation Ui	300 V
Operating time	100 %
Reinforced Insulation (safe separation)	
Us – relay	6mm (DC 3540V)
Us – sensor inputs	6mm (DC 3540V)
Us – electronics, reset, ethernet	6mm (DC 3540V)
Sensor inputs - relay	6mm (DC 3540V)
Sensor inputs – electronics, reset, ethernet	6mm (DC 3540V)
relay - ethernet	6mm (DC 3540V)
Basic insulation	
Relay - Relay	3mm (DC 1420V)
No galvanic separation	Analogue outputs, reset, ethernet
Ethernet- interface	
	RJ45 connection
Speed	10 / 100 Mbit/s
Real time clock	
Power reserve	> 11 days at 25°C
Time deviation	±3 ppm
EMC tests	
	EN 61326-1 - industrial environment
EMC emission	EN 61326-1; CISPR 11 class B
EMC immunity	EN 61326-1 - industrial environment
Fast transient disturbances (Burst)	EN 61000-4-4 ±4 kV
	Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms
Surge immunity test	IEC 61000-4-5 ±2 kV
Electro static discharge immunity test	IEC 61000-4-2 ± 4 kV contact discharge, ± 8 kV air discharge
Installation conditions	
Operating temperature	-20 °C ... +65 °C
Storage temperature	-20 °C ...+70 °C
Altitude	< 2000 m above sea level
Climate resistance	5-85% rel. humidity, no condensation
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	
	Construction type V8, distribution board
Mounting depth	55 mm
Width	8 TE
Dimension (B x H x T)	140 x 90 x 58 mm

Wiring connections single strand
 Finely stranded with wire end ferrule
 Stripping length / specify torque
 Protection class housing / terminals

Mounting

Weight

1 x 0,34 - 1,5 mm² / AWG 22 - 14

1 x 0,1 - 1,0 mm² / AWG 27 - 16

8 mm / 0,5 Nm

IP 30 / IP20

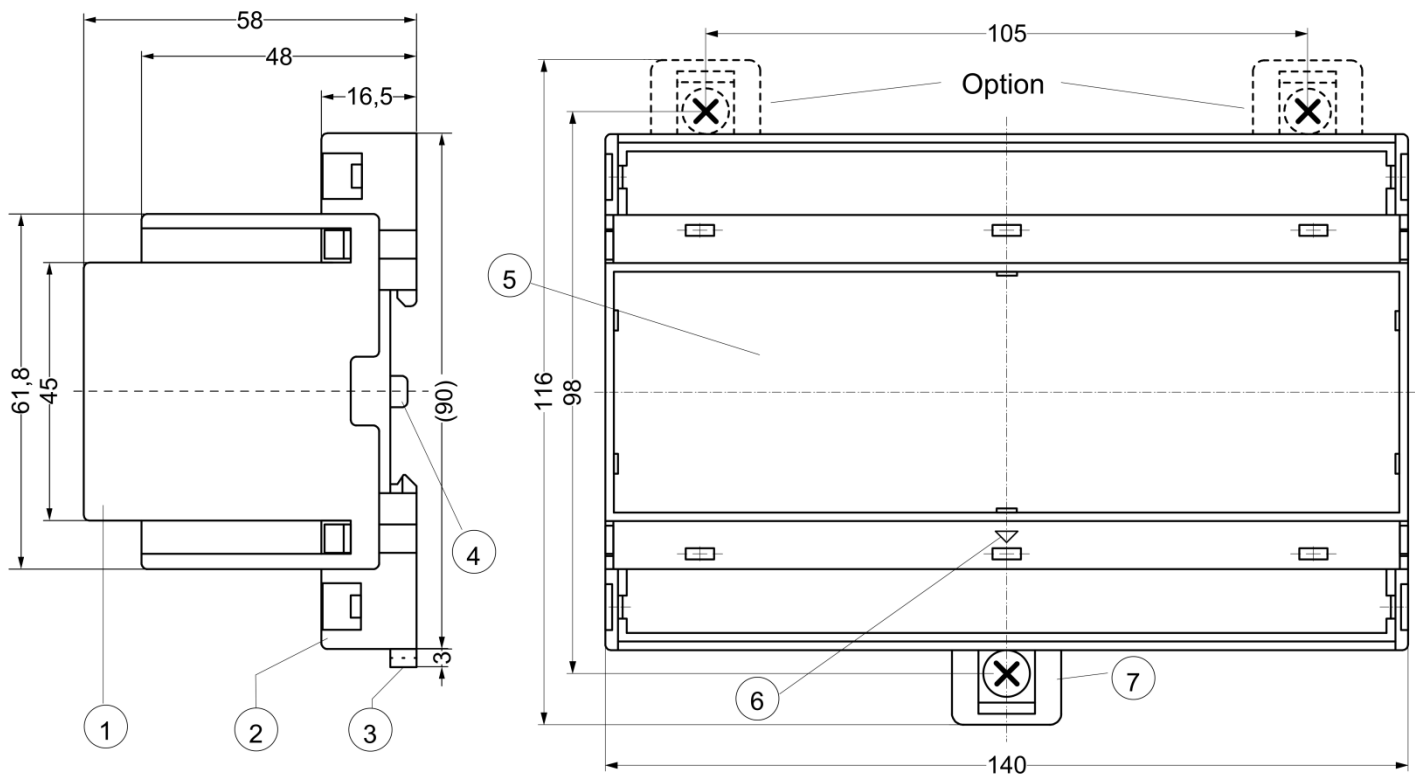
Snap-on fastening on 35 mm mounting rail acc. EN 60 715 or with M4 screwed attachment (additional bar not included in the scope of delivery)

app. 370 g

Subject to technical changes

16 Housing V8

Dimension in mm



- 1 Oberteil / cover
- 2 Unterteil / base
- 3 Riegel / bar for snap mountin
- 4 Plomben Lasche / latch for sealing
- 5 Frontplatteneinsatz / front panel
- 6 Kennzeichen für unten / position downward
- 7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung Ø 4,2 mm / for fixing to wall with screws, Ø 4.2 mm

17 Factory settings of the programs

All parameters are reset when the program is changed.

If you need an overview of the parameters you have set for the documentation, simply use our tool „[Create documentation \(pdf\)](#)“ on the website.

main menu	under menu	Parameter menu	my data	Trafo safe 3x Pt100	Trafo safe 1x Pt100 2x PTC	Trafo safe 4x Pt100 3x windings 1x core
				Pr1.00	Pr1.01	Pr1.02
Sensors	Sensor 1T	Sensor name		winding 1	winding 2	winding 1
		Type		Pt100	Pt100	Pt100
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 2T	Sensor name		winding 2	winding 123	winding 2
		Type		Pt100	PTC	Pt100
		Line resistance [Ω]		3-wire	-	3-wire
	Sensor 3T	Sensor name		winding 3	winding 123	winding 3
		Type		Pt100	PTC	Pt100
		Line resistance [Ω]		3-wire	-	3-wire
	Sensor 4T	Sensor name		---	---	core
		Type		off	off	Pt100
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 5T	Sensor name		---	---	---
		Type		off	off	off
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 6T	Sensor name		---	---	---
		Type		off	off	off
		Line resistance [Ω]		3-wire	3-wire	3-wire
alarms	Alarm K1	Alarm name		Fan with cycl. Test	Fan with cycl. Test	Fan with cycl. Test
		Sensors		1T, 2T, 3T	1T	1T, 2T, 3T
		2 of X		off	off	off
		Alarm on [°C]		130.0 °C	90.0 °C	100.0 °C
		Alarm off [°C]		120.0 °C	80.0 °C	80.0 °C
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		30:00	30:00	30:00
		Relay function		on at alarm	on at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe 3x Pt100	Trafo safe 1x Pt100 2x PTC	Trafo safe 4x Pt100 3x windings 1x core
				Pr1.00	Pr1.01	Pr1.02
Alarms	Alarm K2	Alarm name		Pre alarm	Pre alarm	Pre alarm
		Sensors		1T, 2T, 3T	2T	1T, 2T, 3T
		2 of X		off	off	off
		Alarm on [°C]		140.0 °C	PTC	130.0 °C
		Alarm off [°C]		135.0 °C	PTC	125.0 °C
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	on at alarm	off at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	1T, 2T, 3T, 4T
		Device error		off	off	on
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
	Alarm K3	Alarm name		tripping	tripping	Tripping winding
		Sensors		1T, 2T, 3T	3T	1T, 2T, 3T
		2 of X		off	off	off
		Alarm on [°C]		155.0 °C	PTC	150.0 °C
		Alarm off [°C]		150.0 °C	PTC	145.0 °C
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
	Alarm K4	Alarm name		(Sensor-) device error	(Sensor-) device error	tripping core
		Sensors		-	-	4T
		2 of X		off	off	off
		Alarm on [°C]		0,1	0,1	170.0 °C
		Alarm off [°C]		0	0	165.0 °C
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		off at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		1T, 2T, 3T	1T, 2T, 3T	-
		Device error		in	on	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe 3x Pt100	Trafo safe 1x Pt100 2x PTC	Trafo safe 4x Pt100 3x windings 1x core
				Pr1.00	Pr1.01	Pr1.02
Cyclic test	Cycl. test K1	Cyclic test [on/off]		on	on	on
		Delay on [DD-hh]		7-00	7-00	7-00
		Time on [hh:mm]		00:10	00:10	00:10
	Cycl. test K2	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. test K3	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. Test K4	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
Network		DHCP		on	on	on
		IP-Address				
		Sub netmask				
Settings		language		German	German	German
		date				
		time				
		Display interval [s]		0,5	0,5	0,5
		brightness [%]		50	50	50
		dimming time [s]		300	300	300
		factory settings		-	-	-
		code lock		off / 504	off / 504	off / 504
Simulation		Relay				
		Sensor				
Info		Firmware Version		-05	-05	-05
		serial number				
		Operating hours				
		comment				

main menu	under menu	Parameter menu	my data	Trafo safe 4x Pt100 3x windings 1x core	Trafo safe Fan control, pre alarm, tripping winding tripping core	Trafo safe Pre alarm, tripping winding, tripping core Function monitoring
				Pr1.03	Pr1.04	Pr1.05
Sensors	Sensor 1T	Sensor name		winding 1	winding 123	winding 123
		Type		Pt100	PTC	PTC
		Line resistance [Ω]		3-wire	-	-
	Sensor 2T	Sensor name		winding 2	winding 123	winding 123
		Type		Pt100	PTC	PTC
		Line resistance [Ω]		3-wire	-	-
	Sensor 3T	Sensor name		winding 3	winding 123	core
		Type		Pt100	PTC	PTC
		Line resistance [Ω]		3-wire	-	-
	Sensor 4T	Sensor name		core	core	---
		Type		Pt100	PTC	off
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 5T	Sensor name		---	---	---
		Type		off	off	off
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 6T	Sensor name		---	---	---
		Type		off	off	off
		Line resistance [Ω]		3-wire	3-wire	3-wire
Alarms	Alarm K1	Alarm name		core	Fan with cycl. test	Pre alarm
		Sensors		4T	1T, 2T	1T
		2 of X		off	off	off
		Alarm on [°C]		170.0 °C	PTC	PTC
		Alarm off [°C]		165.0 °C	PTC	PTC
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	on at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe 4x Pt100 3x windings 1x core	Trafo safe Fan control, pre alarm, tripping winding tripping core	Trafo safe Pre alarm, tripping winding, tripping core Function monitoring
				Pr1.03	Pr1.04	Pr1.05
Alarms	Alarm K2	Alarm name		Pre alarm	Pre alarm + error	Tripping winding
		Sensors		1T, 2T, 3T	2T	2T
		2 of X		off	off	off
		Alarm on [°C]		130.0 °C	PTC	PTC
		Alarm off [°C]		125.0 °C	PTC	PTC
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	1T, 2T, 3T, 4T	-
		Device error		off	on	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
	Alarm K3	Alarm name		Tripping winding	Tripping winding	tripping core
		Sensors		1T, 2T, 3T	3T	3T
		2 of X		off	off	off
		Alarm on [°C]		150.0 °C	PTC	PTC
		Alarm off [°C]		145.0 °C	PTC	PTC
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	on at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe 4x Pt100 3x windings 1x core	Trafo safe Fan control, pre alarm, tripping winding tripping core	Trafo safe Pre alarm, tripping winding, tripping core Function monitoring
				Pr1.03	Pr1.04	Pr1.05
Alarms	Alarm K4	Alarm name		(Sensor-) Device error	Tripping core	(Sensor-) Device error
		Sensors		-	4T	-
		2 of X		off	off	off
		Alarm on [°C]		0,1	PTC	0,1
		Alarm off [°C]		0,0	PTC	0,0
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		off at alarm	on at alarm	off at alarm
		Alarm locked		off	off	off
		Sensor error		1T, 2T, 3T, 4T	-	1T, 2T, 3T
		Device error		on	off	on
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
Cyclic test	Cycl. test K1	Cyclic test [on/off]		off	on	off
		Delay on [DD-hh]		-	7-00	-
		Time on [hh:mm]		-	00:10	-
	Cycl. test K2	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. test K3	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. Test K4	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
Network		DHCP		on	on	on
		IP-Address				
		Sub netmask				
Settings		language		German	German	German
		date				
		time				
		Display interval [s]		0,5	0,5	0,5
		brightness [%]		50	50	50
		dimming time [s]		300	300	300
		factory settings		-	-	-
		code lock		off / 504	off / 504	off / 504
Simulation		Relay				
		Sensor				

main menu	under menu	Parameter menu	my data	Trafo safe 4x Pt100 3x windings 1x core	Trafo safe Fan control, pre alarm, tripping winding tripping core	Trafo safe Pre alarm, tripping winding, tripping core Function monitoring
				Pr1.03	Pr1.04	Pr1.05
Info		Firmware Version		-05	-05	-05
		serial number				
		Operating hours				
		comment				

main menu	under menu	Parameter menu	my data	Trafo safe Fan control, pre alarm	Motor safe 3x Pt100	Other 6x Pt100 Individual assignment
				tripping winding, Function monitoring		
				Pr1.06	Pr2.00 *)	Pr3.00
Sensors	Sensor 1T	Sensor name		winding 123	winding 1	Sensor 1T
		Type		PTC	Pt100	Pt100
		Line resistance [Ω]		-	3-wire	3-wire
	Sensor 2T	Sensor name		winding 123	winding 2	Sensor 2T
		Type		PTC	Pt100	Pt100
		Line resistance [Ω]		-	3-wire	3-wire
	Sensor 3T	Sensor name		winding 123	winding 3	Sensor 3T
		Type		PTC	Pt100	Pt100
		Line resistance [Ω]		-	3-wire	3-wire
	Sensor 4T	Sensor name		---	---	Sensor 4T
		Type		off	off	Pt100
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 5T	Sensor name		---	---	Sensor 5T
		Type		off	off	Pt100
		Line resistance [Ω]		3-wire	3-wire	3-wire
	Sensor 6T	Sensor name		---	---	Sensor 6T
		Type		off	off	Pt100
		Line resistance [Ω]		3-wire	3-wire	3-wire
Alarms	Alarm K1	Alarm name		Fan with cycl. test	Pre alarm	Sensor 1T
		Sensors		1T, 2T	1T, 2T, 3T	1T
		2 of X		off	off	off
		Alarm on [°C]		PTC	120.0 °C	10.0
		Alarm off [°C]		PTC	115.0 °C	5.0
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe Fan control, pre alarm	Motor safe 3x Pt100	Other 6x Pt100 Individual assignment
				tripping winding, Function monitoring		
				Pr1.06	Pr2.00 *)	Pr3.00
Alarms	Alarm K2	Alarm name		Pre alarm	tripping	Sensor 2T
		Sensors		2T	1T, 2T, 3T	2T
		2 of X		off	off	off
		Alarm on [°C]		PTC	130.0 °C	20.0
		Alarm off [°C]		PTC	125.0 °C	15.0
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	-	-
		Device error		off	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
	Alarm K3	Alarm name		Tripping winding	(Sensor-) Device error	Sensor 3T
		Sensors		3T	-	3T
		2 of X		off	off	off
		Alarm on [°C]		PTC	250.0 °C	30.0
		Alarm off [°C]		PTC	245.0 °C	25.0
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		on at alarm	off at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		-	1T, 2T, 3T	-
		Device error		off	on	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-

main menu	under menu	Parameter menu	my data	Trafo safe Fan control, pre alarm tripping winding, Function monitoring	Motor safe 3x Pt100	Other 6x Pt100 Individual assignment
				Pr1.06	Pr2.00 *)	Pr3.00
Alarms	Alarm K4	Alarm name		(Sensor-) Device error	-	Sensor 4T
		Sensors		-	-	4T
		2 of X		off	off	off
		Alarm on [°C]		0,1	0,1	40.0
		Alarm off [°C]		0,0	0,0	35.0
		Delay alarm on [mm:ss]		00:00	00:00	00:00
		Delay alarm off [mm:ss]		00:00	00:00	00:00
		Relay function		off at alarm	on at alarm	on at alarm
		Alarm locked		off	off	off
		Sensor error		1T, 2T, 3T	-	-
		Device error		on	off	off
		ROCOT		off	off	off
		ROCOT temperature [°C/s]		-	-	-
		ROCOT change [mm:ss]		-	-	-
Cyclic test	Cycl. test K1	Cyclic test [on/off]		on	off	off
		Delay on [DD-hh]		7-00	-	-
		Time on [hh:mm]		00:10	-	-
	Cycl. test K2	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. test K3	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
	Cycl. Test K4	Cyclic test [on/off]		off	off	off
		Delay on [DD-hh]		-	-	-
		Time on [hh:mm]		-	-	-
Network		DHCP		on	on	on
		IP-Address				
		Sub netmask				
Settings		language		German	German	German
		date				
		time				
		Display interval [s]		0,5	0,5	0,5
		brightness [%]		50	50	50
		dimming time [s]		300	300	300
		factory settings		-	-	-
		code lock		off / 504	off / 504	off / 504

main menu	under menu	Parameter menu	my data	Trafo safe Fan control, pre alarm tripping winding, Function monitoring	Motor safe 3x Pt100	Other 6x Pt100 Individual assignment
				Pr1.06	Pr2.00 *)	Pr3.00
Simulation		Relay				
		Sensor				
Info		Firmware Version		-05	-05	-05
		serial number				
		Operating hours				
		comment				

main menu	under menu	Parameter menu	my data	Other 6x PTC Individual assignment	Other 6x Pt100 Groupe- assignment	
				Pr3.01	Pr3.02	
Sensors	Sensor 1T	Sensor name		PTC 1T	Sensor 1T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
	Sensor 2T	Sensor name		PTC 2T	Sensor 2T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
	Sensor 3T	Sensor name		PTC 3T	Sensor 3T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
	Sensor 4T	Sensor name		PTC 4T	Sensor 4T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
	Sensor 5T	Sensor name		PTC 5T	Sensor 5T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
	Sensor 6T	Sensor name		PTC 6T	Sensor 6T	
		Type		PTC	Pt100	
		Line resistance [Ω]		0,0	3-wire	
Alarms	Alarm K1	Alarm name		PTC 1T	Sensor 1T ... 3T	
		Sensors		1T	1T, 2T, 3T	
		2 of X		off	off	
		Alarm on [°C]		PTC	130.0	
		Alarm off [°C]		PTC	127.0	
		Delay alarm on [mm:ss]		00:00	00:00	
		Delay alarm off [mm:ss]		00:00	00:00	
		Relay function		on at alarm	on at alarm	
		Alarm locked		off	off	
		Sensor error		-	-	
		Device error		-	-	
		ROCOT		off	off	
		ROCOT temperature [°C/s]		-	-	
		ROCOT change [mm:ss]		-	-	

main menu	under menu	Parameter menu	my data	Other 6x PTC Individual assignment	other 6x Pt100 Groupe- assignment	
				Pr3.01	Pr3.02	
Alarms	Alarm K2	Alarm name		PTC 2T	Sensor 1T ... 3T	
		Sensors		2T	1T, 2T, 3T	
		2 of X		off	off	
		Alarm on [°C]		PTC	150.0	
		Alarm off [°C]		PTC	147.0	
		Delay alarm on [mm:ss]		00:00	00:00	
		Delay alarm off [mm:ss]		00:00	00:00	
		Relay function		on at alarm	on at alarm	
		Alarm locked		off	off	
		Sensor error		-	-	
		Device error		-	-	
		ROCOT		off	off	
		ROCOT temperature [°C/s]		-	-	
		ROCOT change [mm:ss]		-	-	
	Alarm K3	Alarm name		PTC 3T	Sensor 4T ... 5T	
		Sensors		3T	4T, 5T	
		2 of X		off	off	
		Alarm on [°C]		PTC	80.0	
		Alarm off [°C]		PTC	77.0	
		Delay alarm on [mm:ss]		00:00	00:00	
		Delay alarm off [mm:ss]		00:00	00:00	
		Relay function		on at alarm	on at alarm	
		Alarm locked		off	off	
		Sensor error		-	-	
		Device error		-	-	
		ROCOT		off	off	
		ROCOT temperature [°C/s]		-	-	
		ROCOT change [mm:ss]		-	-	
	Alarm K4	Alarm name		PTC 4T	Sensor 4T ... 5T	
		Sensors		4T	4T, 5T	
		2 of X		off	off	
		Alarm on [°C]		PTC	90.0	
		Alarm off [°C]		PTC	87.0	
		Delay alarm on [mm:ss]		00:00	00:00	
		Delay alarm off [mm:ss]		00:00	00:00	
		Relay function		on at alarm	on at alarm	
		Alarm locked		off	off	
		Sensor error		-	-	
		Device error		-	-	
		ROCOT		off	off	
		ROCOT temperature [°C/s]		-	-	
		ROCOT change [mm:ss]		-	-	

main menu	under menu	Parameter menu	my data	Other 6x PTC Individual assignment	other 6x Pt100 Groupe- assignment	
				Pr3.01	Pr3.02	
Cyclic test	Cycl. test K1	Cyclic test [on/off]		off	off	
		Delay on [DD-hh]		07-00	07-00	
		Time on [hh:mm]		00:12	00:00	
	Cycl. test K2	Cyclic test [on/off]		off	off	
		Delay on [DD-hh]		00-01	07-00	
		Time on [hh:mm]		00:33	00:00	
	Cycl. test K3	Cyclic test [on/off]		off	off	
		Delay on [DD-hh]		00-01	07-00	
		Time on [hh:mm]		00:33	00:00	
	Cycl. Test K4	Cyclic test [on/off]		off	off	
		Delay on [DD-hh]		00-04	07-00	
		Time on [hh:mm]		00:44	00:00	
Network		DHCP		on	on	on
		IP-Address				
		Sub netmask				
Settings		language		German	German	
		date				
		time				
		Display interval [s]		0,5	0,5	
		brightness [%]		50	50	
		dimming time [s]		300	300	
		factory settings		-	-	
		code lock		off / 504	off / 504	
Simulation		Relay				
		Sensor				
Info		Firmware Version		-05	-05	
		serial number				
		Operating hours				
		comment				