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Operating Manual MS220K2 / MSR220K2

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- PTC-resistor relay for 2 PTC-Circuits

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1 Application and Short description

ZIEHL PTC-resistor relays protect motors, transformers, machines and equipment against thermal overload. With ZIEHL PTC Sensors MINIKA ® applied they offer best solutions for nominal response temperatures 60°C…180°C.

ZIEHL PTC-resistor relays are designed for PTC-sensors according to DIN 44081 and DIN 44082. Therefore sensor and relays are exchangeable. PTC-resistor sensors are suitable for the installation into windings of electrical machines, bearings and transformers as well as to monitor the temperature of liquid media, airflow and gases.
Used in conjunction, they provide a effectively and reliable protection in case of

- blocking rotors, heavy starts, countercurrent operation
- undervoltage and phase failure
- increased ambient temperature and hindered cooling

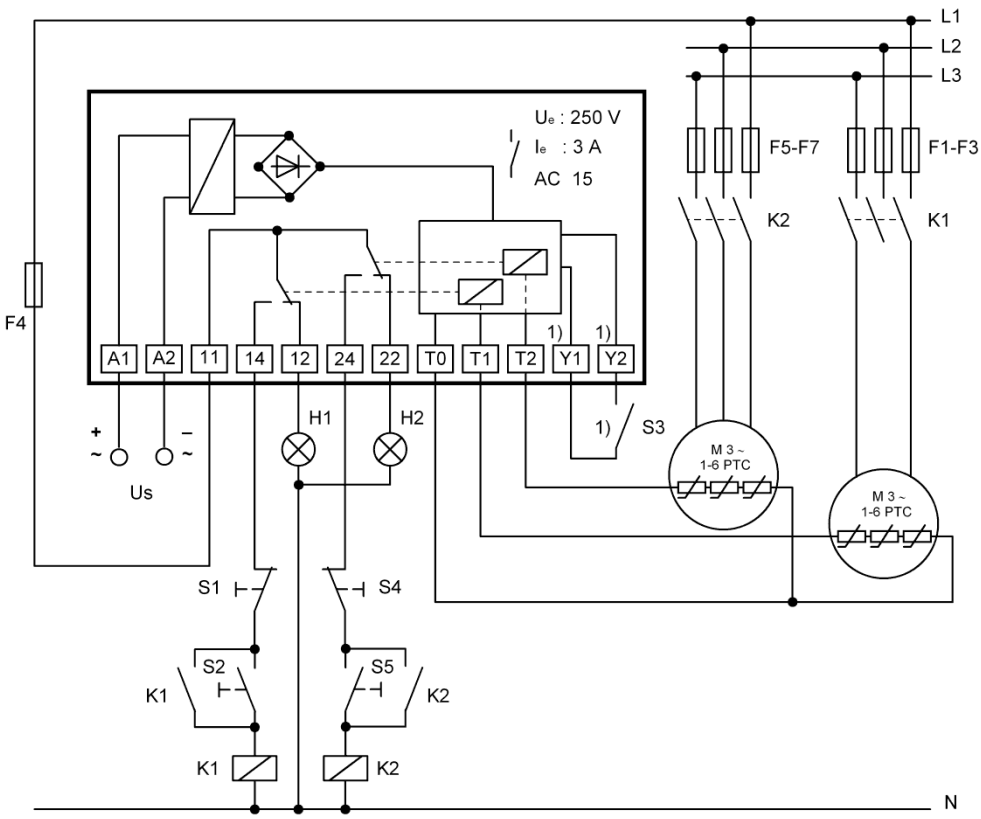
2 Approvals:

c UL us UL Recognized Component

without electronic reclosing lock	**MS220K2**
with electronic reclosing lock	**MSR220K2**

Both variants available with or without short-circuit monitoring.

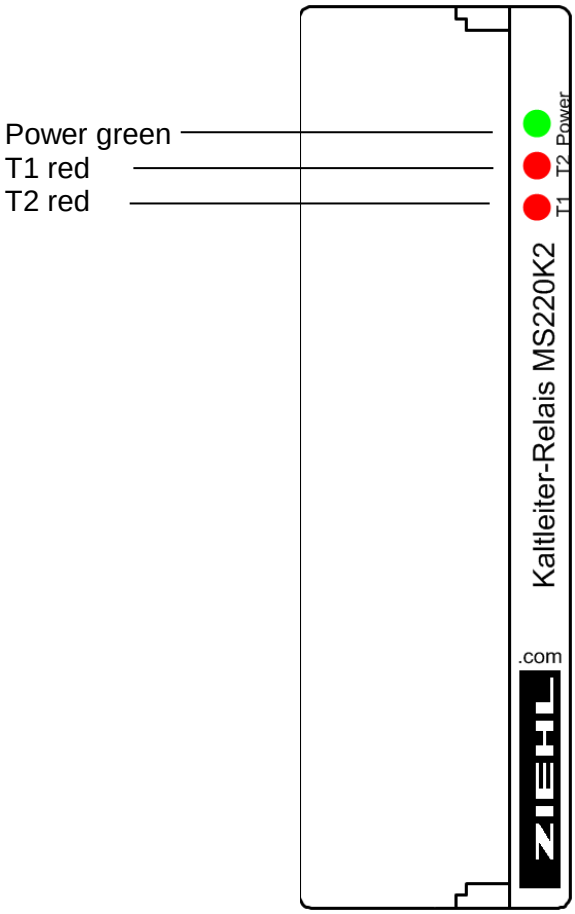
3 Wiring scheme



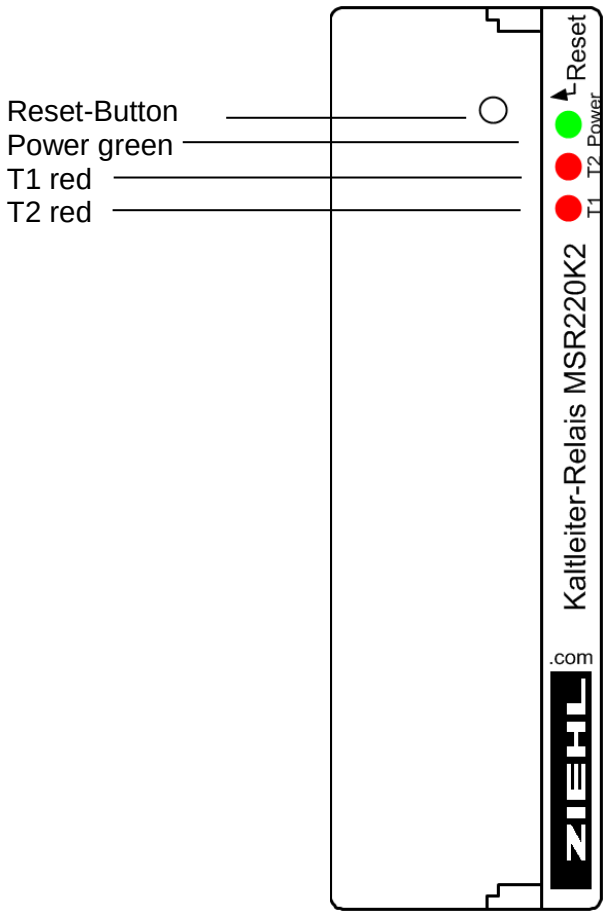
Us = supply voltage
S2, S5 = pushbutton ON
H1, H2 = trip alarm
K1, K2 = contactor
S1, S4 = pushbutton OFF
S3 = extern reset
F1 - F8 = fuse
1) only MSR

4 Display and Operating Elements

MS220K2



MSR220K2



5 Functional overview

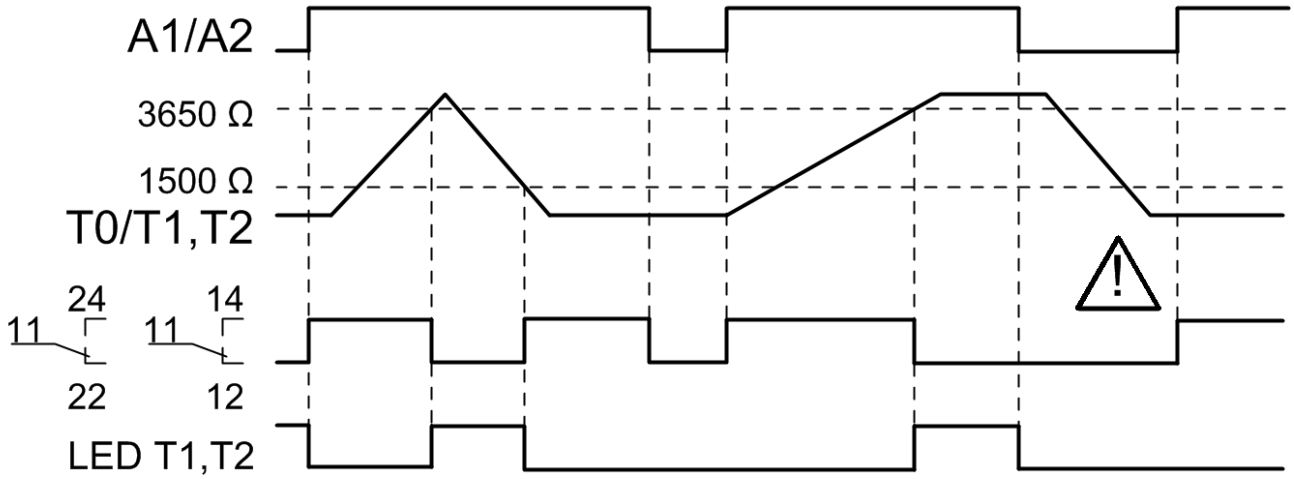
- 2 PTC-resistor sets with up to 6 PTC-sensors (250Ω) in series
- output relay 2 x 1 change-over contact (co)
- LEDs for operation and overheated sensor circuits (alarm)

6 Detailed description

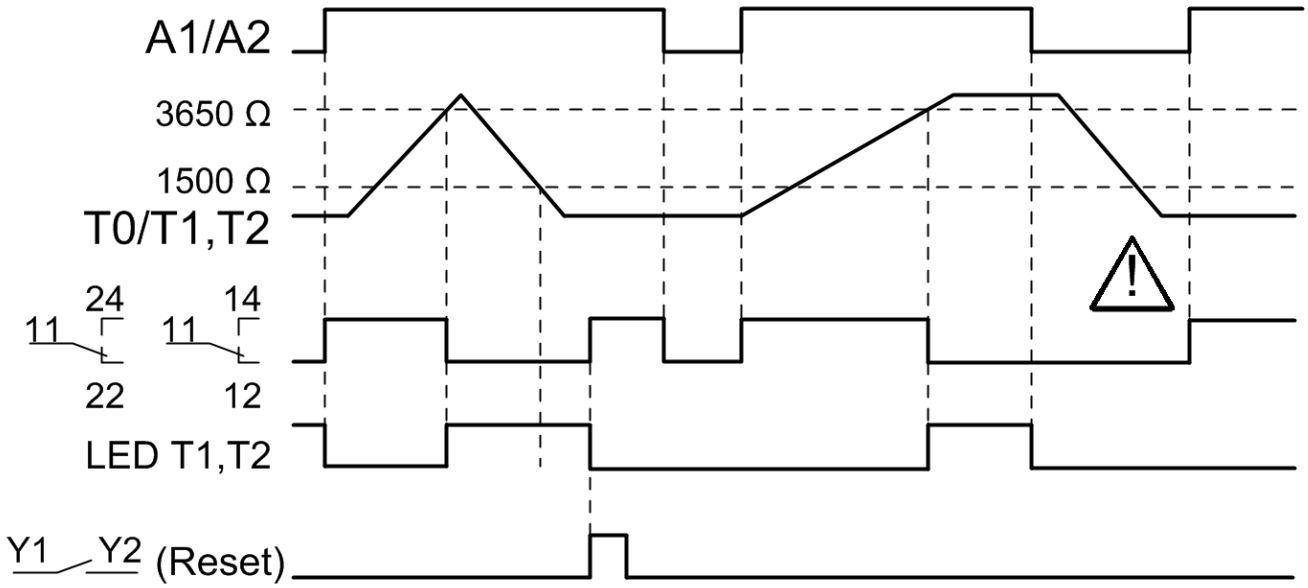
The MS(R)220K2 monitors 2 PTC-resistor sets at the same time. In cold state, the resistance is <250 Ω per sensor (sensor circuit < 1,5 kΩ). The relay has picked up and contacts 11/14 (11/24) are closed. The resistance of the sensor rises rapidly at nominal response temperature NRT. The relay releases at a resistance of 3…4 kΩ and contacts 11/12 (11/22) close. Measurement line and sensor are being monitored for interruption. MS types switch on automatically when the temperature has decreased approx. 5 °C. MSR types with electronic reclosing lock switch on again when the temperature has decreased approx. 5 °C and a Reset is made (push built-in button or external Reset with terminals Y1/Y2 closed) or by return of supply voltage.

7 Action Chart

7.1 MS220K2



7.2 MSR220K2



8 Important Notes/ Putting into operation

Attention!
Trip relays with supply voltage DC/AC 24 V are intended to use at power supplies according EN 61558. Wiring connection must be protected.

Attention!
Trip relays type MSR 220 K 2 with electronic reclosing lock switch on automatically by return of the supply voltage.
To prevent automatically start-up the applicant must install additional components or monitor the power supply lines.

Attention!
To safeguard the safety function of the device connect the outputs directly in the control circuit of the equipment according terminal plan The relay contacts must be fused externally to prevent welding of the contacts.

Attention!
Before switching on make sure that the operational voltage Us of the type- plate and the mains voltage are the same.

- The devices must be installed within rooms of international protection class IP 54 or better.
- Notice safety remarks! The applicant must observe safety rules and standards.

9 Assembly

The applicant must observe safety rules and standards.
The trip relays must be installed within rooms of international protection class IP 54 or better.

The device can be mounted:

- on 35 mm standard rail EN 60715
- with screws of type M4 for wall fastening

When installing the device into the switchgear cabinet, please observe the max. admissible temperature. Care for both, sufficient clearance to other devices or sources of heat or enough forced draught. If cooling is made more difficult, e.g. close devices with increased surface temperature or by handicap of airflow cooling, the permissible ambient temperature has to be reduced.

10 Trouble – shooting and remedies

Relay does not pick up. Please check

- The supply voltage Us at terminals A1/A2. The green LED must light on.
- The PTC's at terminals T0-T1 and T0-T2 are connected correctly. Red LED's must not light on.
- The resistance of a PTC circuit must be at 50 Ω < R < 1650 Ω. The terminal voltage is to be measured < 2,5 V.

Attention! Check PTC's only with measuring voltages of < 2.5 V.

- The nominal response temperature of the PTC sensor must be correct. The PTC Trip Relay releases at resistance values of 3,3 kΩ < R < 4 kΩ and picks up < 1,65 kΩ.

Relay does not release. Check

- Check, if the connected PTC has the correct operating temperature. With no PTC sensor connected the PTC Trip Relay must release. The terminal voltage must be approx. 8 V.
- In case of any other malfunctions, replace device. Please add a description of the occurred malfunction when sending back for repair.

11 Technical data

Power supply	
Rated supply voltage Us	AC 115 V, AC 230 V (see lateral type plate) AC / DC 24 V (no potential separation)
Tolerance voltage Us	AC 0,9 Us … 1,1 Us DC 21 ... 30 V
Frequency (AC)	50 / 60 Hz
Tolerance frequency	40 - 62 Hz
Power consumption	<2 VA
PTC-resistor connection	2 sensor circuits
Number	2 sets with 1 ... 6 PTC´s in series according to DIN 44081/44082
Cut-out-point	≤ 4000 Ω
response tolerance of system	±6 °C
Collective resistance cold sensors	≤ 1650 Ω
Terminal voltage (sensors)	≤ 2,5 V at R ≤ 1650 Ω ≤ 7,5 V at R ≥ 4000 Ω
Terminal current (sensors)	≤ 1,25 mA
Relay output	EN 60947-5
Contacts	2 x 1 changeover contact (co)
Switching voltage	max. AC 415 V
Switching current	max. 6 A
Switching power AC cos = 1	max. 2000 VA max. 120 W at DC 24 V
Rated operational current Ie	3 A AC15 250 V ; 2 A DC13 24 V
Recommended fuse	3,15 A gl (slow)
Mechanical contact life	3 x 10^7 operations
Electrical contact life	1 x 10^5 operations at 240 V / 6 A 1 x 10^6 operations at 240 V / 2 A
Factor of reduction at cos=0,3	0,5
Testing conditions	EN 60947
Rated impulse voltage	4000 V
Overvoltage category	III
Contamination level	2
Rated insulation voltage Ui	250 V
Transformer	EN 61558-2-6 (VDE 0551)
On-period	100 %
Rated ambient temperature range	-20 ... +55 °C
Interference resistance	EN 50 082-2
Interference transmission	EN 50 081-1
Vibration resistance	10 g, 30 ... 150 Hz
Shock resistance	10 g 11 ms
Housing:	design "K"
Dimensions (H x W x D)	75 x 22,5 x 110 mm
Line connection	1 x 0,5…2.5 mm^2 each
Fine-wired with wire-end sleeve	1 x 0,14 mm^2 bis 1,5 mm^2 each
Protection housing	IP 40
Protection terminals	IP 20
Panel inclination	any
Attachment	on 35 mm standard rail according to EN 60715
Optional: screws	M4, only with extra bar (not enclosed)
Weight	approx. 150 g

Subject to technical modifications

12 Design K

dimensions in mm