

Operating Manual MS220K

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- PTC-Resistor-Relay



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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 an effectively and reliable protection in case of

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

Approvals:

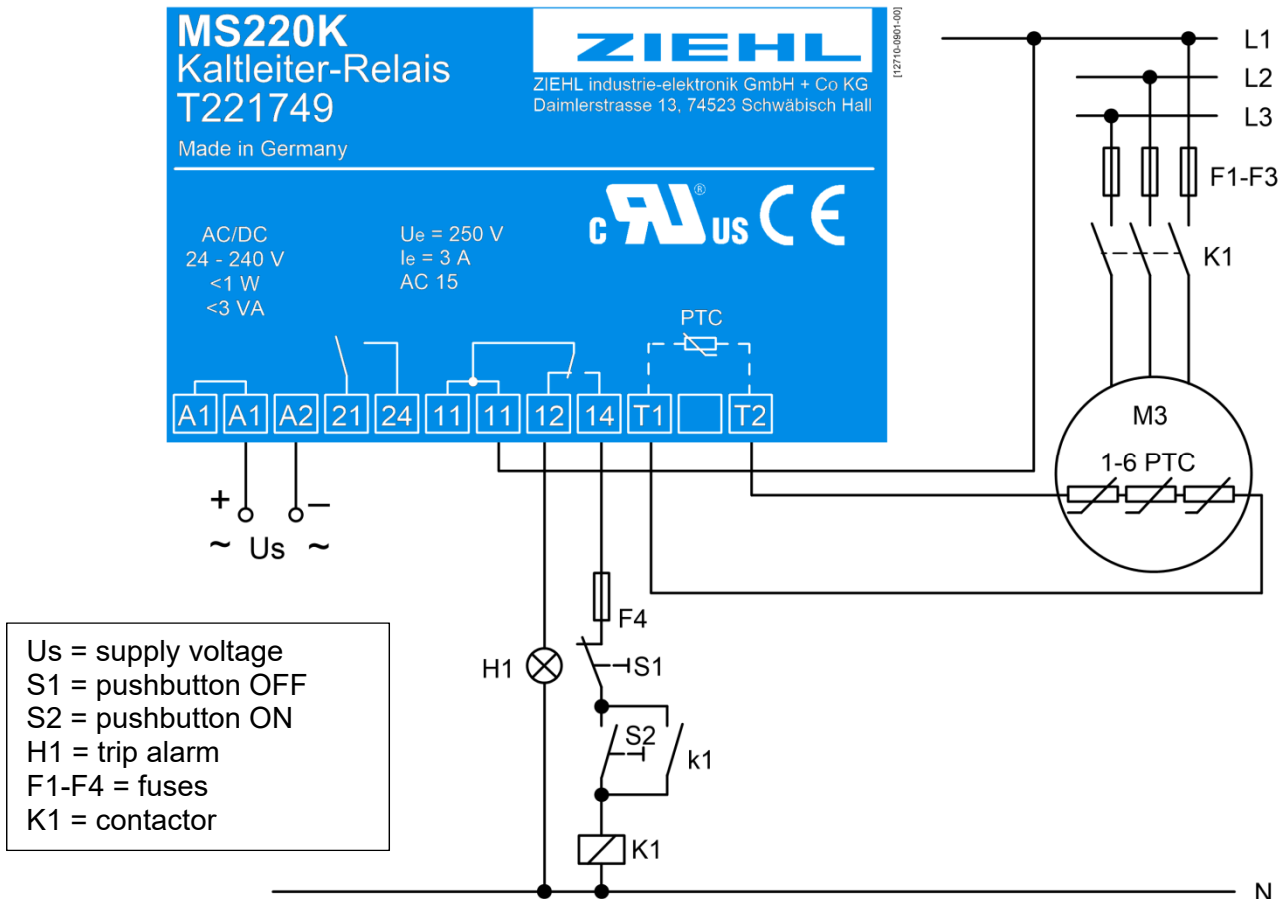


UL Recognized Component

2 Overview of functions

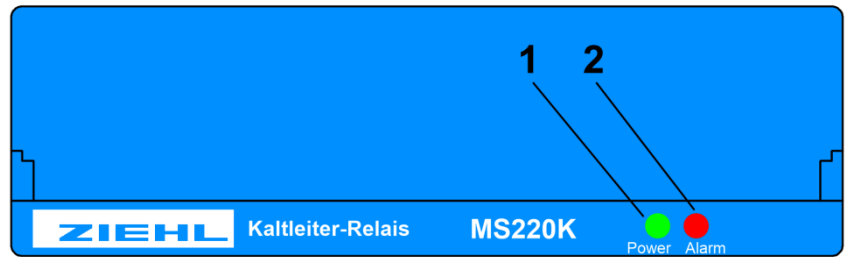
- 1 PTC-resistor set with up to 6 PTC-sensors (250Ω) in series
- output relay with 1 change-over contact (co) and 1 NO contact
- operating status display with LED
- additional terminals for looping the power supply (A1, 11)
- K-Housing, vertical terminal order
- width 22.7 mm
- snap mounting on 35 mm standard DIN rail or screw mounting

3 Connection plan



4 Display and controls

- 1 LED Power on
- 2 LED Alarm



5 Detailed description

The operational readiness of the device is indicated by the green LED Power.

A current monitors continuously the resistance of the sensors. In cold state, the resistance is $<250 \Omega$ per sensor (sensor circuit $< 1,5 \text{ k}\Omega$). The relay has picked up and contacts 11-14 (21-24) are closed (red LED Alarm = off). The resistance of the sensor rises rapidly at nominal response temperature NRT. The relay releases at a resistance of $3 \dots 4 \text{ k}\Omega$ and contacts 11-12 close (21-24 open) (red LED Alarm = on). The device switch on automatically when the temperature has decreased approx. $5 \text{ }^\circ\text{C}$.

6 Important notes



WARNING!

Dangerous electrical voltage

Disconnect power before working on equipment.

Read and understand these instructions before installing, operating or maintaining the equipment.

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-up and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instruction manual, the information written on the equipment and the relevant security instructions for the setting up and the use of electrical units.



Attention!

Universal power supply.

The unit is equipped with an universal power supply, that is suitable for DC- and AC-voltages.



Attention!

Before switching on make sure that the operational voltage U_s of the type- plate and the mains voltage are the same! Before switching on ensure, that the supply voltage U_s written on the lateral type plate corresponds to the mains voltage!

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.

7 Installation

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 (option)

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.

8 Putting into operation

Check the correct function of the device

- power on: the green LED "Power" is on
- relays switch on when the resistance at input T1-T2 is low ($< 1500 \Omega$)
 - ⇒ terminals on 11-14 and 21-24 close, the red LED "Alarm" is off
- relays switch off when the resistance at input T1-T2 is high ($\geq 4000 \Omega$)
 - ⇒ terminals 11-12 close and 21-24 open, the red LED "Alarm" is on

9 Troubleshooting and remedies

Relays don't switch on:

- check the power supply U_s on terminals A1-A2, the green LED "Power" must be on
- check the PTC at terminals T1-T2, the resistance must be $< 1650 \Omega$. The red LED "Alarm" must be off

Relays don't switch off:

- check the connected PTC, has it the correct nominal response temperature NRT? At open terminals the relays must switch off. Voltage at terminals approx. 5 V.

LED "Power" blinks and LED "Alarm" lights:

- internal device error, switch device off and on. If the error remains the device is defective

Attention! Check PTC's only with measuring voltages of $< 2.5 \text{ V}$.

In case of any other malfunctions, replace device. Please add a description of the occurred malfunction when sending back for repair.

10 Technical data

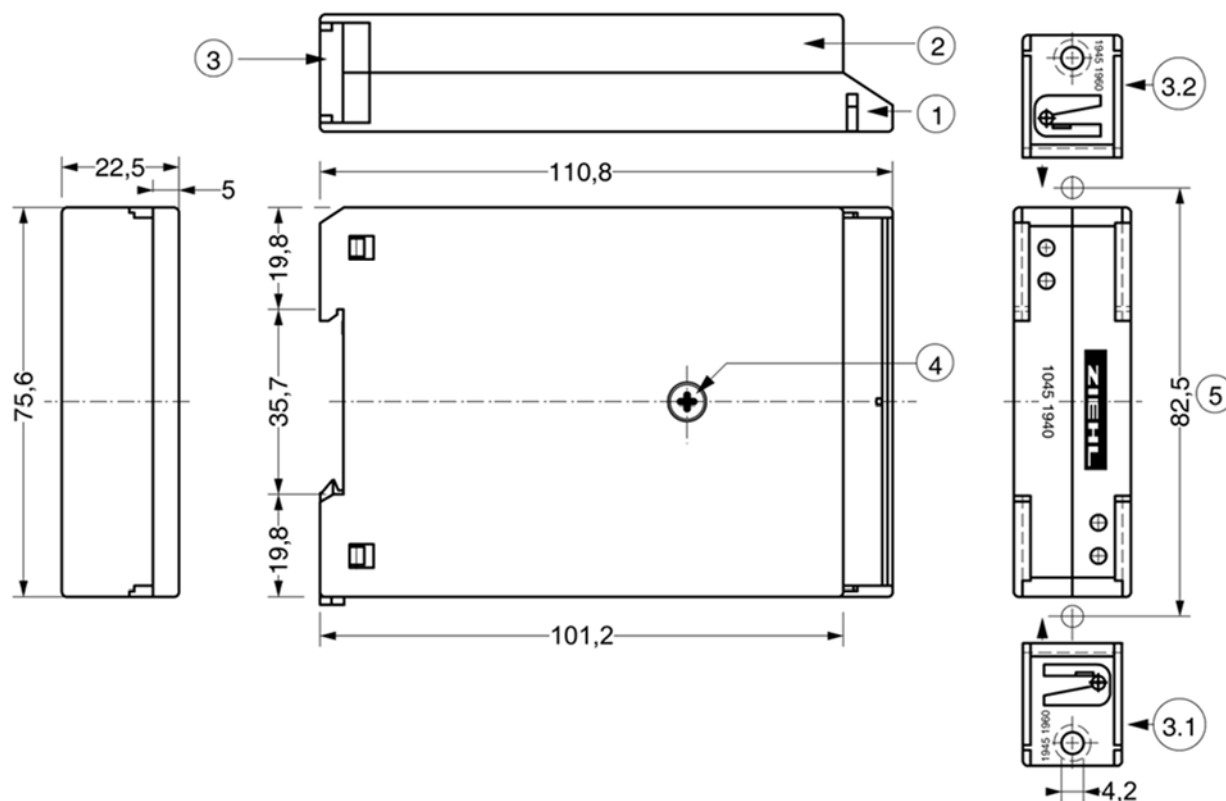
Power supply (A1, A2)	
Rated supply voltage Us	DC 20,4 ... 297 V / AC 20 ... 264 V
Frequency	AC 40...500 Hz, from AC 80 V: 10...500 Hz
Power consumption	< 1 W < 3 VA
Relay output	
	EN 60947-5-1
Contacts	1 change-over contact , 1 NO contact
Switching voltage	max. AC 300 V; DC 300 V
Minimum voltage / current	12 V / 10 mA
Switching current Ith	max. 5 A
Current per terminal	max. 5 A
Switching power (ohm resistive load)	max. 1250 VA max. 120 W at DC 24 V
rated operating current Ie	AC-15 Ie = 3 A Ue = 250 V
rated operational voltage Ue	DC-13 Ie = 2 A Ue = 24 V DC-13 Ie = 0,2 A Ue = 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 C 300
PTC thermistor input	
	acc. DIN 44081 / DIN 44082
Number	2 x 1...6 PTC thermistor in series
Rated response temperature TFS	60 °C ... 180 °C
Response tolerance	±6 °C
Temperature monitor cut-out-point	3,3 kΩ...3,65 kΩ...3,85 kΩ
Temperature monitor reclosing point	1,5 kΩ...1,6 kΩ ...1,65 kΩ
Collective resistance cold thermistor	≤ 1,5 kΩ
Terminal voltage (PTC thermistor)	≤ 2,2 V at R ≤ 3,65 kΩ ≤ 5 V at R = ∞
Terminal current (PTC thermistor)	≤ 1 mA
Power consumption	≤ 1,5 mW
Test conditions	
	EN 60947-8
Rated impulse voltage	4000 V
Overvoltage category	III
Pollution degree	2
Rated insulation voltage Ui	300 V
Transformer	EN 61558-2-6 (VDE 0551)
On-period	100 %
EMC immunity (industry)	EN 61000-6-2
EMC emission	EN 61000-6-3
Installation conditions	
Fitting position	any
Rated ambient temperature range	-20 °C ... +55 °C
Storage temperature	-20 °C ... +70 °C
Temperature for wiring (admissible)	-5 °C ...+70 °C
Altitude	up to 2000 m
Climatic conditions	5-85% rel. F., no condensation
Vibration resistance EN 60068-2-6	2...13,2 Hz ±1 mm 13,2...100 Hz 0,7g

Housing	Design K
Plastic Material	Polyamid PA 66, UL 94 V-2
Dimensions (H x W x D) mm	without terminals: 75,6 x 22,5 x 110,8 mm with terminals: 75,6 x 22,5 x 115,7 mm
Line connection 1 wire	1 x 0,5 ... 2,5 mm ² (AWG 22-14)
Stranded wire with wire-end sleeves	1x 0,14 ... 1,5 mm ²
Insulation Strip length	8 mm
Tightening torque	0,5 Nm, UL: 7 lb-in
Protection housing/terminals EN 60529	IP 20
Fitting position	any
Fastening, fixing	standard rail 35 mm EN 60715
Optional: Screw mounting	M4, only with additional bolt (not part of delivery)
Weight	approx. 110 g

Subject to technical modifications

11 Dimensions - Design K

Dimensions in mm



- 1 Bottom
- 2 Top
- 3 Bolt
- 4 Screw
- 5 Holes for screw mounting