ZIEHL industrie - elektronik GmbH + Co , Daimlerstr.13 , D-74523 Schwäbisch Hall , Tel. +49 791 504-0 , Fax 504-56

Operating manual

MS 220 C and MSR 220 C
MS 220 F(K) and MSR 220 F(K)
MS 220 K(K) and MSR 220 K(K)

1. General

Ziehl PTC-resistor trip devices and ZIEHL PTC-resistors according to DIN 44 081 and 44 082 offer the best possible protection against thermal overload. They monitor and protect

- windings in motors
- transformers
- bearings in equipment and machinery
- oil and other liquid media
- airflows and gases

	without monitoring short circuit	with monitoring short circuit
automatic reset	MS 220 C, MS 220 F, MS 220 K	MS 220 FK, MS 220 KK
electronic reclosing lock	MSR 220 C, MSR 220 F, MSR 220 K	MSR 220 FK, MSR 220 KK

Functions

- designs MS(R) 220 F(K) and MS(R) 220 K(K) are available with 1 or 2 changeover contacts
- sensors with nominal response-temperatures (NRT) 60 ... 180 °C available
- monitoring of contacts (nc) possible (not versions "...FK" ank "...KK")
- 1...6 sensors can be connected in series
- snap mounting on 35 mm standard rail according to DIN EN 50 022
  MS(R) 220 C and MS(R) 220 K(K) also with screws M4

Standards

Ziehl PTC-resistor trip devices are single tested and confirm with DIN VDE 0160, DIN VDE 0660, IEC 337-1 and CENELEC HD 420.
PTB-approval see sign on lateral type plate.

Notes

- MS for supply AC/DC 24 V have to be connected to power-supplys according to DIN VDE 0551
- the MS may only be used in surroundings with protection min. IP 54
- relays type MSR ... make a automatic reset after return of supply voltage

Functional description

A current monitors continuously the resistance of the sensors. In cold state, the resistance is <250 Ω per sensor. The relay has picked up and contacts 11/14 (21/24) are closed.
The resistance of the sensors rises rapidly at NRT. The MS(R) switch at a resistance 3...4 kΩ, the relay releases, contacts 11/12 (21/22) close.
Versions ...FK and ...KK with short circuit monitoring of the sensors also switch at a sensor resistance < app. 20 Ω.
Types MS switch on automatically when the temperature has decreased app. 5 °C or when the short-circuit has disappeared.
Types MSR with electronic reclosing lock only switch on again when the temperature has decreased app. 5 °C or when the short-circuit has disappeared and a reset is made (built-in button or external connected button connecting teminals Y1/Y2) or after return of supply voltage.

2. Technical data

Power Supply		
Supply Voltage Us	AC 110-120 V, AC 220-240 V, AC 380-415 V AC/DC 24 V (no potential separation) version see lateral type plate	
Tolerance Voltage Us	AC : ± 10% / DC 21 ... 30 V	
Frequency (AC)	48 - 62 Hz	
Power Consumption	<2 VA	
Sensor connection	PTC-sensor according to DIN 44 081 / DIN 44 082	
number	1 ... 6 PTC in series	
max. cold resistance	≤1,65 kΩ	
cut-out-point	≤4 kΩ	
reclosing point	>1,65 kΩ	
short circuit	<app. 20 Ω (only types with short-circuit monitoring)	
Sensor voltage	design "C"	design "F" and "K"
	<2,5 V / <1,5 kΩ	
	<7,5 V / 10 kΩ	<3,5 V / <4 kΩ
	<30 V at R = ∞	<9,2 V at R = ∞
Sensor current	<0,5 mA	<1,3 mA
Relay output	1 or 2 changeover-contacts	
Contacts	AgNi 90/10	
Nominal switching voltage	AC 250 V / 50 Hz	
Switching voltage	max. AC 415 V, max. DC 300 V	
Switching current	max. 6 A	
Switching power AC cos = 1	max. 2000 VA	
Rated operational current AC 15	Ie = 1 A / Ue 400 V, Ie = 3 A / Ue = 250 V	
Rated operational current DC 13	Ie = 3 A / Ue 24 V	
Mechanical Contact Life	30x10E6 operations	
Electrical Contact Life	1 x 10E5 operations at 6 A /250 V 1 x 10E6 operations at 2 A /250 V	
Recommended Fuse	3,15 A gl (slow)	
Testing conditions	VDE 0169 / VDE 0110	
Rated insulation voltage Ui according to VDE 0110	AC 400 V	
Contamination Level	3	
Rated impulse voltage	4 kV	
Overvoltage category	3	
On-period	100 %	
Interference transmission	EN 50 081	
Interference resistance	EN 50 082	
Climate resistance	F, DIN 40 040	
max. ambient temperature	-20 ... +55 °C	
Vibration resistance	10 g, 30 ... 150 Hz	
Shock resistance	20 g	

Housing:

Dimensions (H x W x D)	design "C" (MS(R) 220 C:	72 x 33 x 60 mm
	design "F" (MS(R) 220 F(K):	75 x 22,5 x 110 mm
	design "K" (MS(R) 220 K(K):	75 x 22,5 x 110 mm
Line connection	F and C: max. 2 x 1.5 mm^2 each K: max. 1 x 2.5 mm^2 each	
Protection Housing	IP 40	
Protection contacts	IP 20	
Contact safety	conforms with VBG 4, VDE 106 part 100	
Panel inclination	any	
Mounting	snapable on 35 mm standard rail according to DIN EN 50 022 design C (design K optional): M 4 screws	
Weight	C: app. 160 g F: app. 160 g K: app. 150 g	

3. Installation

Mounting

* 35 mm mounting rail according to DIN 50 002 or
  MS(R) 220 C and MS(R) 220 K(K) also with screws M4
* Connect wires as per wiring scheme

When installing the device into the switch-gear cabinet, please observe the max. admissible ambient temperature. Care for both, sufficient clearance to other devices or sources of heat or enough forced draught. Generally recommended mininum clearance: 10 mm.

4. Putting into operation

Before switching on make sure that the supply-voltage Us on the lateral type plate corresponds with the mains voltage.

* Apply mains voltage to terminals A1/A2.
* When the resistance of the sensor circuit is <1650 kΩ (FK/KK: and >20Ω), the relay picks up.
* When the resistance of the sensor circuit is >4 kΩ (FK/KK: or <20Ω), the relay releases.

5. Trouble-shooting and remedies

Relay does not pick up:

- Check whether supply voltage U_S at terminals A1/A2 is available and corresponds with the voltage indicated on the lateral type plate of the device.
- Check whether PTC's are connected correctly and if the resistance is >30Ω / <1,65kΩ.
- On devices MSR press Reset-button

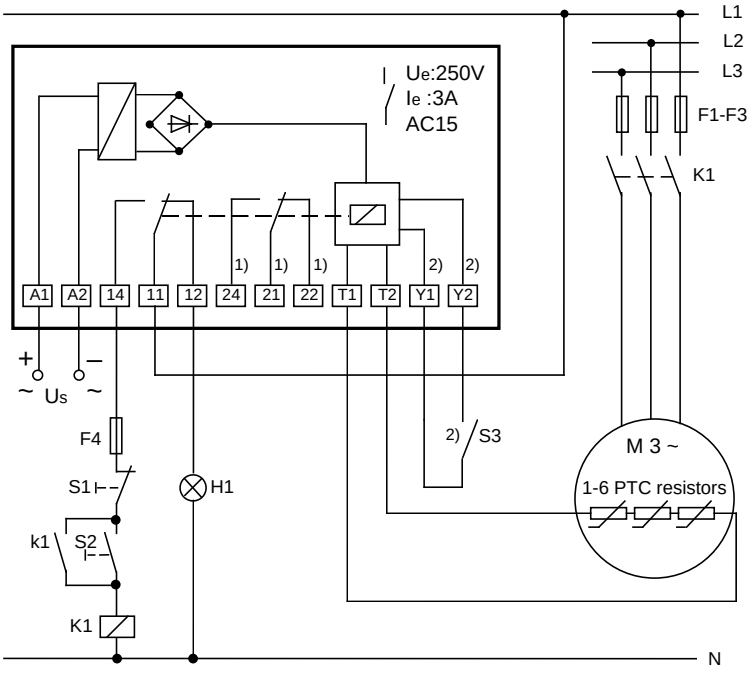
Relay does not release:

- Check whether the nominal response temperature of the sensor-circuit is correct
- With no sensor connected, the voltage at T1/T2 must be app. 20 V (design "C") and 8 V (design "F" and "K")

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

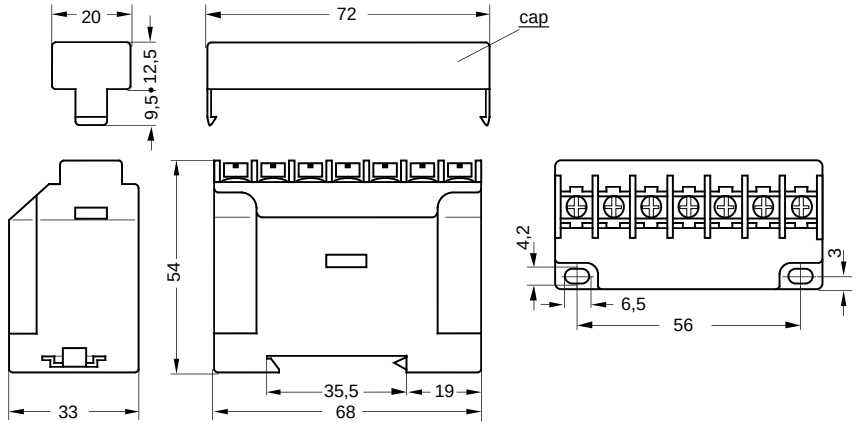
* In case of any other malfunctions, replace device. Please add a description of the occurred malfunction when sending back for repair.

Wiring Scheme

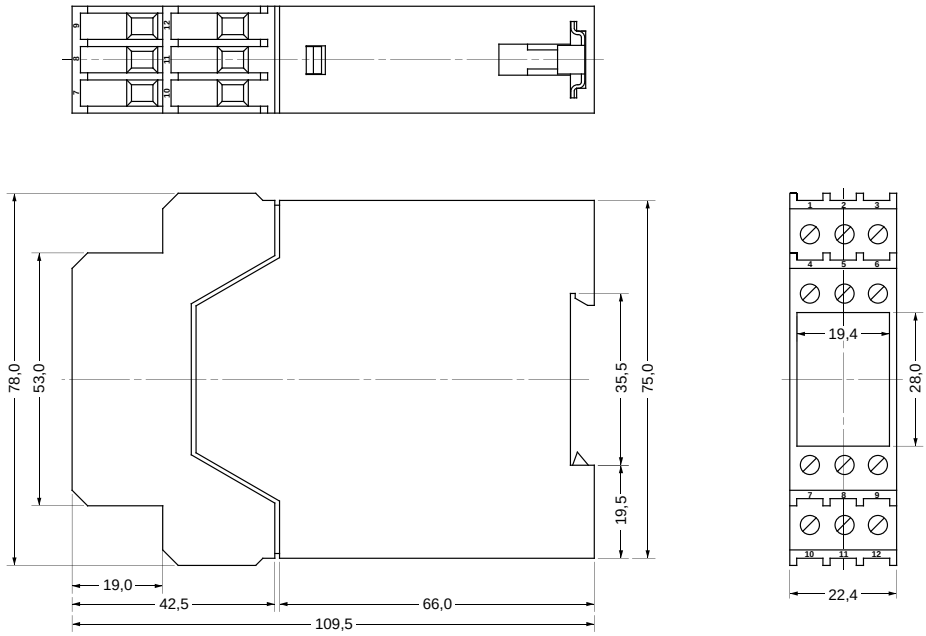


Us = supply voltage
S1 = pushbutton OFF
S2 = pushbutton ON
S3 = extern reset
H1 = trip alarm
F1-F4= fuse
K1 = contactor
1) only versions with 2x CO
2) only MSR

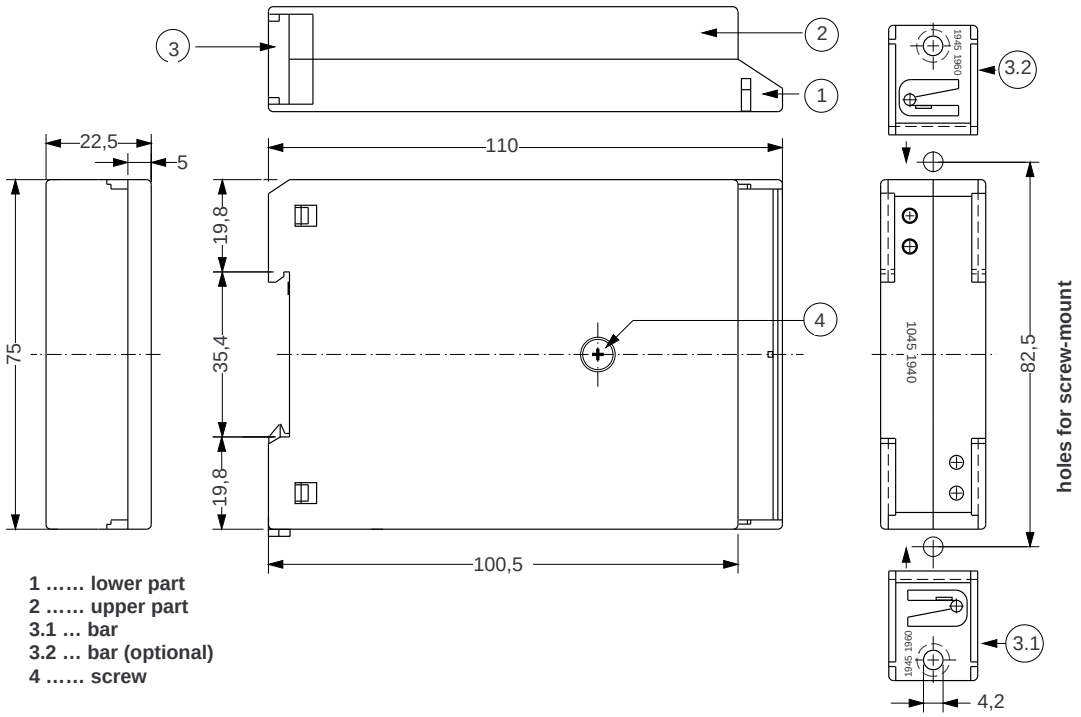
Design C



Design F



Design K



1 …… lower part
2 …… upper part
3.1 … bar
3.2 … bar (optional)
4 …… screw

date / name 03.09.1998 WL / Fz
sheet 4 of 4
15.09.98

Subject to technical modifications.

Z. Nr.: 1075 0710
Type: MS(R) 220
EA - Nr.: 1003