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Archive document

Operating manual MSF 220 SU

Application

The PTC-resistor trip device MSF 220 SU is especially designed for monitoring the temperature of dry transformers. Two PTC-circuits can be connected. As soon as the admissible temperature at the sensors is exceeded, the relay for ALARM 1 (early warning) respectively ALARM 2 (switching off) will pick up.
As the relays for ALARM 1/2 are connected in operaiting current principle, they do not state an alarm-report during switching on the MSF 220 SU. An additional timing-relay is not required.
Relay K3 is connected in closed circuit principle. It is used for monitoring the function of the MSF.

Function

* 2 PTC resistor circuits, 1 to 6 PTC each (max. cold resistance of circuit 1500Ω each)
* potential-free contact (no) for ALARM 1
* potential-free contact (no) for ALARM 2
* no additional timing relay required
* relay K3 for monitoring correct operation (i.e. short-circuit in sensors or presence of supply-voltage)
* LED´s signal state of relays "ON", K1 and K2
* monitoring of short-circuit in sensors
* test-button (sunk) for test of ALARM 1 and 2

Note

Thanks to the connection of relay K1 and K2 in operating current principle, there will be no switching action when switching on the power-supply. Therefore the device is especially suitable where an auxiliary voltage is not available and the secondary voltage of the monitored transformer is being used. The MSF 220 SU can furthermore be used advantageously when combining it with operating current switches.
As K1 and K2 will only pick up when temperature in one of the monitored PTC circuits exceeds, the function of the MSF 220 SU has to be controlled by monitoring the contacts of K3 or by regular routine checks (test-button).
When a MSF 220 SE ist replaced by a MSF 220 SU, bridges have to be applied between terminals 3 - 4 - 5 (31 - 23 - 13). The outputs "operation" at terminals 4 and 5 loose their function.

Functional description

K1 (ALARM 1) and K2 (ALARM 2) are released during normal operation. K3 will pick up as long as supply voltage is applied, it will release when supply voltage is not present, short-circuit in one of the sensor-circuits or malfunction of the MSF 220 SU.
As soon as the nominal response temperatur (NRT) of at least one of the PTCs for ALARM 1 is exceeded, relay K1 picks up, contacts 5-6 (13/14) close for alarm 1.
As soon as the NRT of at least one of the PTCs for ALARM 2 is exceeded, relay K2 picks up, contacts 2-4 (23/24) close for alarm 2. If the temperature drops to approx. 5 °C below the NRT of ALARM 1 or 2 , relays K1 resp. K2 release.

Technical Data

Type-Plate:	
Order number:	see type plate
Supply voltage Us:	
frequency:	on the device

Tolerance Us	
universal typ	AC / DC 20 ... 270 V
normal typ	AC 0.9 ... 1.1 Us
Tolerance frequency Us	48 ... 62 Hz
PTC-resistor connection	2 x 1...6 PTC in series
Cut-out point	2,8...3,6 kΩ, typ. 3,2 kΩ
Reclosing point	1,8...2,4 kΩ, typ. 2,1 kΩ
Collective resistance of cold sensors	≤ 1.5 kΩ
short- circuit resistance	< app. 20 Ω
Terminal voltage (sensors)	≤ 2.5 V at ≤ 250 Ω ≤ 7.5 V at ≥ 4 kΩ
PTC - resistor current	max. 5 mA
Relay output	contacts AgCdO
Switching voltage	AC max. 400 V DC 110-250 V 0.25 A
Switching current	AC max. 8 A DC 60 V 0.5A
Switching power	AC max. 1100 VA DC 30 V 1.5 A
Rated continious current I_{th}	AC 6 A DC 24 V 5 A
Rated operational current I_e	2A AC15 400 V 2A DC13 24 V
	4A AC15 250V
Prefuse for device and contacts	AC: T 4 A DC: F 2 A
Mechanical contact life	5 x 10^7 operations
Electrical contact life	2 x 10^5 operations (at max. switching capacity)
Factor of reduction at cos = 0.4	0.6 x max. switching capacity
Switching-on delay	app. 2 sec.
Testing conditions	VDE 0660 / VDE 0160
Rated insulation voltage	AC 250 V
Isolation	VDE 110 / Gr. C
Transformer	VDE 0550
Test voltage between supply voltage, relay outputs and sensor side	2.5 kV
On period	100 %
max. ambient temperature	-20 ... +55 °C
Climatic category	F (according to DIN 40 040)
Housing:	design S-12, plug-in housing
Dimensions (H x W x D)	82 x 42 x 121 mm
Line connection	12-pole, max. 2 x 1.5 mm^2 each
Protection Housing	IP 40
Protection contacts	IP 20
Panel inclination	any
Mounting	snapable on 35 mm standard rail according to DIN or assembly with screws M 4
Weight	app. 250 g

Installation - Putting into operation

The plug base can be mounted either with

* 35 mm mounting rail according to DIN 50 002 or
* M4 screws

Wiring directly to plug base

* Connect wires as per wiring scheme
* Plug in electronics and fix with knurled screw

Attention!
Do not plug in device alive nor detach it from socket.

When installing the device into the switch-gear cabinet, please observe the max. admissible temperature. Care for both sufficient clearance to other devices or sources of heat or enough forced draught. Generally recommended mininum clearance: 1 cm.

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

* Apply mains voltage to terminals 11 and 12.
* When device is ready for operation, relay K3 picks up, terminals 3-1 (31/34) are connected, the LED "ON" lights up.
* Relay K1 picks up and LED "ALARM 1" lights up, as soon as the input at terminal 8-10 becomes high-resistive.
* Relay K2 picks up and LED "ALARM 1" lights up, as soon as the input at terminal 9-10 becomes high-resistive.
* Relay K1, K2 release as soon as the inputs at terminals 8, 10 become low-resistive.
* Relay K3 releases at a failure in the system (loss of supply-power, failure of MSF or at a short-circuit at one of the PTC-inputs) .
* When the TEST-button is pressed, K1 and K2 pick up, the LEDs light up .

Trouble-shooting and remedies

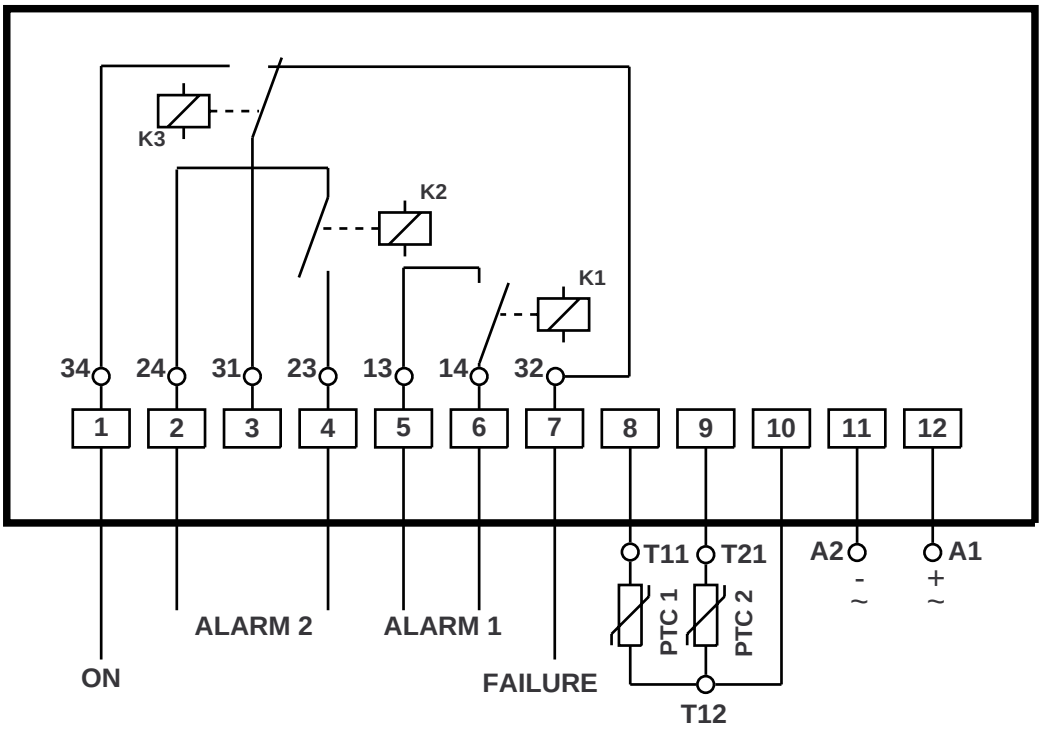
* K3 does not pick up..
  - Check whether supply voltage U_S at terminal 11, 12 is available and corresponds to the voltage indicated on the lateral type plate of the device.
  - Check whether the resistance of the PTC-circuits is > 20 Ω.

* LED´s for ALARM 1 and/or 2 light up continuously.
  Check whether PTC's at terminals 8, 10 and 9, 10 are connected correctly. Both PTC's must be connected and low-resistive.

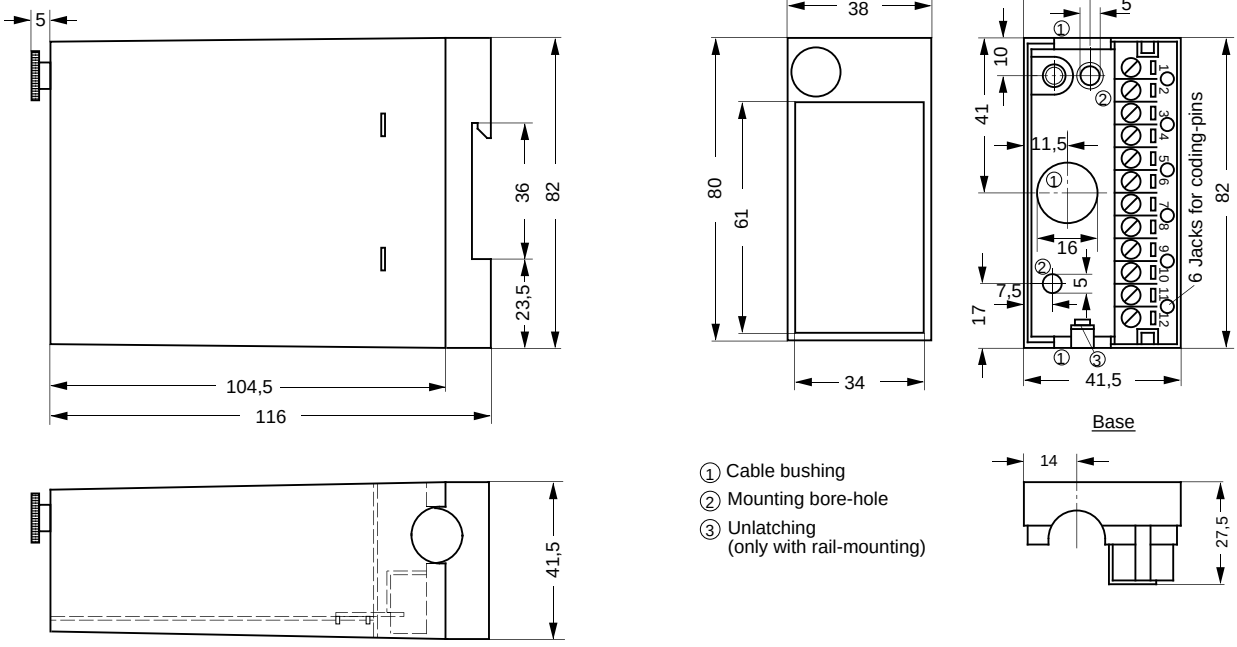
Attention! Check PTC's only with measuring voltages of < 2.5 V.

* In case of any other malfunctions, replace device and send it in together with a description of the occurred malfunction.

Wiring Scheme



Design S 12



Z. Nr.: 1062 0710.2
Type: MSF 220 SU
EA - Nr.: 912