

# TRIP CIRCUIT SUPERVISION RELAY TSG 912

The Type TSG 912 relay supervises the trip circuit of circuit breaker and it activates delayed alarm and visual indication in the event of trip circuit failure or mechanism malfunction. The relays are available for all kinds of circuit breakers and for any combination of standard trip and alarm voltages.

Two limiting resistors are supplied separately with the relay type TSG 912 .. X .. If the relay is accidentally short circuited, they provide current limitation which will not result in trip coil operation. These resistors are to be mounted in the trip circuit, outside the relay so that stringent safety requirements are maintained.

Limiting resistors are mounted inside the relay type TSG 912 .. N .. in applications where less stringent safety requirements may be observed. For 220 V, only relays with external resistors will be delivered. The relay TSG 912 is delivered with LED to indicate the alarm status.

## DETECTED FAILURES

After a 400 ms delay, the relay activates an alarm in the event of the following failures:

- Trip voltage failure
- Trip coil interruption
- Trip circuit wiring interruption
- Circuit breaker malfunction

## DESIGN

The relay AB and C are of rugged and proven construction mounted in a phenolic housing with screw terminals. The case is available for mounting on rail according to DIN 46277/3.

The monitoring relay AB has two separate windings (dielectric strength: 2,5 kV) capable of attracting relay AB individually or in series. The alarm relay C has one NO and two NC contacts for alarm functions and a release time of greater than 400 ms.

## FUNCTION

The relay TSG 912 .. X .. must be connected according to wiring diagram 1. The relay TSG 912 .. N .. must be connected according to wiring diagram 2.

Under healthy conditions and with the circuit breaker closed, the monitoring relay AB is attracted via winding 3-2 (winding 4-1 is disconnected by the NC auxiliary contact of the circuit breaker). Alarm relay C is attracted by the contact of relay AB.

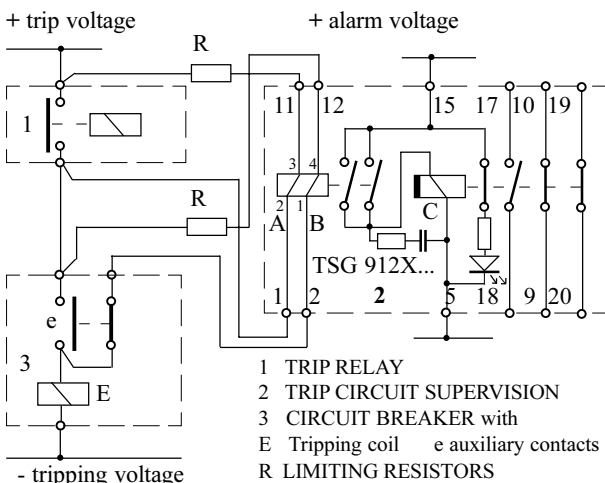


Winding 3-2 of the monitoring relay detects any failure in the trip circuit and the relay releases. Relay C also releases after 400 ms, resulting in activation of the alarm.

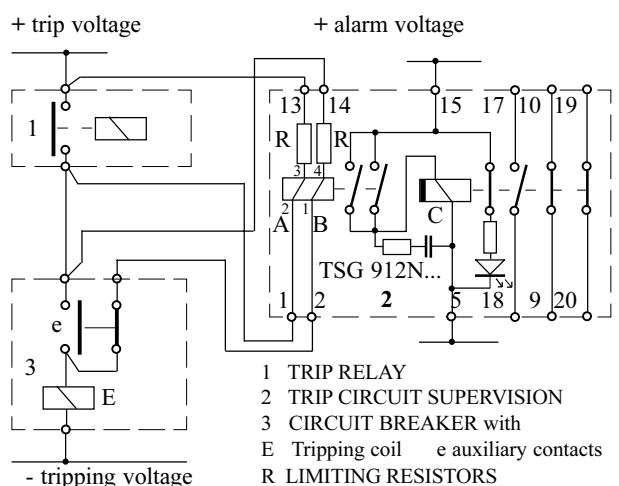
Under healthy conditions and with the circuit breaker open, the monitoring relay is attracted by both windings 3-2 and 4-1 in series by means of the NC auxiliary contact of the circuit breaker. The relay AB detects any trip circuit failures in the same manner as described above with the circuit breaker closed.

The relays AB and C are delayed on drop-off for a total of greater than 400 ms to prevent a false alarm resulting from brief voltage dips. In addition, the alarm cannot be activated during a normal tripping operation, when windings 3-2 of relay AB is momentarily short circuited by the trip relay contact. However, the alarm is activated if the trip relay fails to reset due to a failure of the circuit breaker tripping mechanism.

**WIRING DIAGRAM 1** (external resistors)



**WIRING DIAGRAM 2** (internal resistors)



## VOLTAGE RANGE

The relays TSG 912 are available for all combinations of the following trip and alarm voltages:

60V= 110V= 125V= 220V=  
max. permissible line resistor 400 Ohm

## LIMITING RESISTOR

Two separate limiting resistors are supplied with the relay TSG 912..X.. and have the following values:

Tripping voltage	limiting resistor
60 V=	1600 $\square$
110 V=	3000 $\square$
125 V=	3600 $\square$
220 V=	8900 $\square$

## TECHNICAL SPECIFICATIONS

### Trip circuit

Tripping voltage  $\square 20\%$  60 - 110 - 125 - 220 V=

Operating power at	60V	1,3 Watt
	110 V	2,3 Watt
	125 V	2,7 Watt
	220 V	4,3 Watt

Limiting resistor <40 mA  
max. permissible line resistor <400 Ohm

### Alarm circuit

Alarm voltage  $\square 20\%$  60 - 110 - 125 - 220 V=

Power input at	60 V	0,7 Watt
	110 V	0,8 Watt
	125 V	0,9 Watt
	220 V	2,0 Watt

Alarm delay > 400 ms

### Visual indicator

Display LED red

### Alarm relay C

strength SEV / IEC 1025.1976  
contacts 2 x NC + 1 x NO  
contact material Ag gold plated  
contact load AC1 / DC2 - 3A 380 V~

### General specifications

Ambient temperature range  $-20^{\circ} \div +80^{\circ}\text{C}$   
Dielectric strength 2500 V RMS 50 Hz 1 Min.  
weight with internal resistor 500 gr  
weight without resistor 480 gr  
weight of an external resistor 100 gr

### Housing

Insulation VDE 0110-GRC / 250 V  
protection class IP 40 Ter-  
minals 2 x 1,5 mm<sup>2</sup> with wire seal  
dust proof

### External limiting resistor

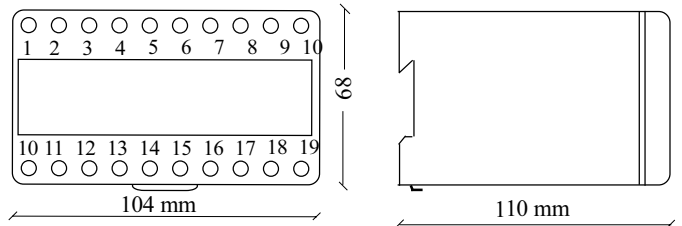
Resistor values See tabel  $\pm 10\%$   
Terminals 4 mm<sup>2</sup> with wire seal  
Dielectric strength 2500 V RMS 50 Hz 1 Min.

## TYPE DESIGNATION - ORDER SPECIFICATION

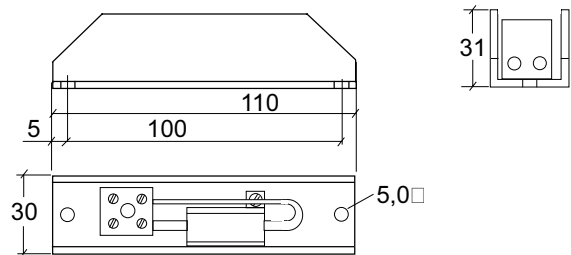
	TSG 912	X/N	06	L	12
<b>Series</b>	_____				
<b>Limiting resistor</b> (220V Type only with ext. res.)	external X internal N				
<b>Tripping voltage x10</b>	60 V= 06 110 V= 11 125 V= 12 220 V= 22				
<b>Visual indication with LED</b>	L				
<b>Alarm voltage x10</b>	60 V= 06 110 V= 11 125 V= 12 220 V= 22				

## Housing dimensions

Housing TSG 912 15.000.2805



## DIMENSION OF EXTERNAL LIMITING RESISTOR Execution 'Standard'



## DIMENSION OF EXTERNAL LIMITING RESISTOR Very special execution for mounting on DIN rail

