

## VARIMETER Trip circuit monitor UG 5124



### Your Advantages

- Wide auxiliary voltage range DC 20 ... 265 V
- Limiting of the power consumption at measuring circuit by a voltage independent constant current source
- On delay- / release delay each adjustable

### Features

- According to IEC/EN 60 255-1
- Monitors continuously breaker trip circuits
- 2 changeover contacts
- Galvanic separated electronic
- De-energized on trip
- With pluggable terminal blocks for easy exchange of devices
- Terminal blocks coded
- Width 22,5 mm

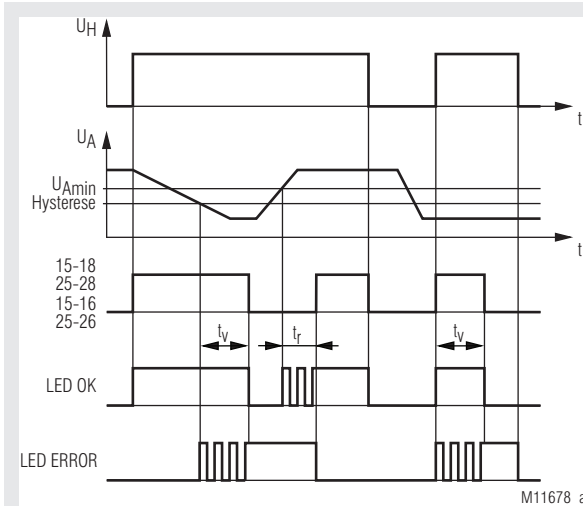
### Product Description

The trip circuit monitor UG 5124 is used to monitor control and trip circuits in electrical controls. It detects interruptions of the trip circuit coil, interruptions of wires, increase resistance, welded contacts, missing control and auxiliary voltage. The setting of the both time delays is simply done on 2 rotary switches on the front of the device. As the power supply and the measuring circuit are galvanically separated, 2 different voltage sources can be connected.

### Approvals and Markings



### Function Diagram



### Applications

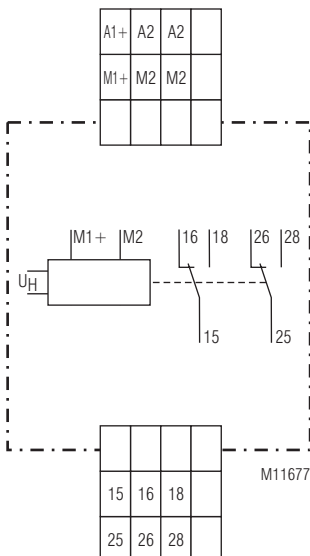
Monitoring of control and trip circuits at electrical systems:

- Circuit breakers
- Load circuits contactors
- Signal circuits

### Function

The trip circuit monitor contains a constant current source, optical isolation, a monitoring circuit, timing circuits, three LEDs and 2 changeover contacts for diagnostics. The constant current source feeds a low low current of 1.5 resp. 5 mA depending on the relay model used into the trip circuit monitor. The measuring inputs are connected across NO contact (trip contact) that has to be monitored and the measuring current flows between the 2 poles of the control voltage of the circuit to be monitored. The relay energises, when the current cannot flow due to a failure. The timing circuit avoids a failure indication during the short activation of the circuit breaker via the trip contact. It is also important, that the voltage does not drop under the minimum value  $U_{Amin}$ .

### Circuit Diagram



### Connection Terminals

Terminal designation	Signal designation
A1+, A2	Auxiliary voltage DC
M1+, M2	Connections for Measuring circuit
15, 16, 18	Contacts Relay 1
25, 26, 28	Contacts Relay 2

## Function Note

The required voltage in the trip circuit for a correct function can be calculated as follows.

$$U_C > U_{Amin} + (R_C \cdot I_C)$$

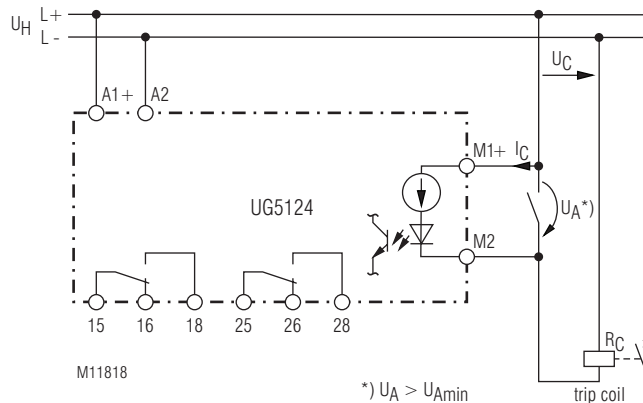
Variant	Measuring current $I_C$	Voltage $U_{Amin}$
1	1,5 mA	40 V
2	5 mA	20 V

$U_C$  = Control voltage

$U_A$  = Measuring voltage M1+/M2

$R_C$  = Resistance of tripping coil

$I_C$  = Measuring current



The voltage  $U_{Amin}$  has a hysteresis of 2%. I.e. the relay switches at a voltage of  $U_{Amin}$  - Hysteresis in error state (contacts 15, 16 and 25, 26 closed). If the voltage  $U_{Amin}$  is acceded, the relay switches to good stated (contacts 15, 18 and 25, 28 closed).

## Indicators

green LED „ON“:	permanent on:	Auxiliary supply connected
yellow LED „OK“:	permanent on:	No failure.
	flashing:	Release delay time is running
red LED „Error“:	permanent on:	Failure.
	flashing:	On delay time is running

## Technical Data

### Time circuit

#### Time setting

On delay  $t_r$ :

0 ... 9 s (1 s steps)

Release delay  $t_f$ :

0 ... 4 s (1 s steps)

Repeat accuracy:

± 2 % of the set value

### Measuring circuit M1+ / M2

#### Measuring current $I_C$

up to 1.5 mA: 1,5 mA, typ.

up to 5 mA: 5 mA, typ.

#### Measuring voltage range

Measuring current  $I_C$  up to 1.5 mA: DC 40 ... 265 V

Measuring current  $I_C$  up to 5 mA: DC 20 ... 60 V

#### Voltage $U_{Amin}$

Measuring current  $I_C$  up to 1.5 mA: DC 40 V

Measuring current  $I_C$  up to 5 mA: DC 20 V

Accuracy: ± 5 %

Hysteresis: 2 %

Repeat accuracy: < 3%

### Auxiliary voltage input A1+ / A2

Auxiliary voltage  $U_H$ : DC 20 ... 265 V

Nominal consumption: 2 W

### Output

Contacts:

2 changeover contacts

Thermal current  $I_{th}$ :

see quadratic total current limit curve (max. 4 A per contact)

### Switching capacity

to AC 15:

NO contact: 3 A / AC 230 V IEC/EN 60 947-5-1

NC contact: 1 A / AC 230 V IEC/EN 60 947-5-1

to DC 13: 1 A / DC 24 V IEC/EN 60 947-5-1

### Electrical life

to AC 15 at 1 A, AC 230 V: 1,5 x 10<sup>5</sup> switch. cycl. IEC/EN 60 947-5-1

### Permissible switching frequency:

1800 / h

### Short circuit strength

max. fuse rating: 4 A gG / gL IEC/EN 60 947-5-1

Mechanical life: ≥ 30 x 10<sup>6</sup> switching cycles

### General Data

Operating mode:

Continuous operation

### Temperature range

Operation: - 10 ... + 60 °C (device free-standing)

Storage: - 40 ... + 80 °C

Altitude: < 2.000 m IEC 60 664-1

### Clearance and creepage distances

Rated insulation voltage: 300 V

Overvoltage category: III

rated impuls voltage / pollution degree: IEC 60 664-1

Auxiliary voltage / Measuring input: 6 kV / 2

Auxiliary voltage / Contacts: 6 kV / 2

Measuring input / Contacts: 6 kV / 2

Contacts 11, 12, 14 / 21, 22, 24: 6 kV / 2

### EMC

Electrostatic discharge (ESD): 8 kV (air) IEC/EN 61000-4-2

HF irradiation

80 MHz ... 6 GHz: 10 V / m IEC/EN 61000-4-3

Damped oscillatory wave immunity test

Differential mode voltage: 1 kV IEC/EN 61000-4-18

Common mode voltage: 2,5 kV IEC/EN 61000-4-18

Fast transients: 2 kV IEC/EN 61000-4-4

Surge voltages

between

wires for power supply: 2 kV IEC/EN 61000-4-5

between wire and ground: 4 kV IEC/EN 61000-4-5

HF-wire guided: 10V IEC/EN 61000-4-6

Interference suppression: Limit value classe B

Degree of protection

Housing: IP 40 IEC/EN 60 529

Terminals: IP 20 IEC/EN 60 529

Technical Data	
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94
<b>Vibration resistance:</b>	Amplitude 0,35 mm, Frequency 10 ... 55 Hz, IEC/EN 60 068-2-6
<b>Climate resistance:</b>	10 / 060 / 04 IEC/EN 60 068-1
<b>Wire connection:</b>	DIN 46 228-1/-2/-3/-4
<b>Plugin with screw terminals (PS)</b>	
max. cross section:	1 x 0.25 ... 2.5 mm <sup>2</sup> solid or stranded ferruled (isolated) or 2 x 0.25 ... 1.0 mm <sup>2</sup> solid or stranded ferruled (isolated)
Insulation of wires or sleeve length:	7 mm
<b>Wire fixing:</b>	captive slotted screw or cage clamp terminals
<b>Fixing torque:</b>	0.5 Nm
<b>Mounting:</b>	DIN rail IEC/EN 60715
<b>Weight:</b>	approx. 152 g
Dimensions	
<b>Width x height x depth:</b>	22.5 x 107 x 120 mm

Troubleshooting	
Failure	Potential cause
Requirement $U_A > U_{Amin}$ not fulfilled	Broken wire, blown fuse, tripping coil interrupted, increased contact resistance
Fault in auxiliary supply	Voltage supply not connected
The NO contact in the monitored trip circuit is longer closed as required during operation	NO contact sticks or is welded

### Safety Notes



**Dangerous voltage.**  
**Electric shock will result in death or serious injury**

**Disconnect all power supplies before servicing equipment**

- Faults must only be removed when the relay is disconnected
- The user has to make sure that the device and corresponding components are installed and wired according to the local rules and law (TUEV, VDE, Health and safety).
- Settings must only be changed by trained staff taking into account the safety regulations. Installation work must only be done when power is disconnected.
- The touch protection of the connected elements and the isolation of the connection wires have to be chosen to be suitable for the highest voltage connected to the device.

### Set Up Procedure

The connection has to be made according to the connection examples.

### Standard Types

UG 5124.82PS DC 40 ... 265 V 1,5 mA  $U_H = DC 20 \dots 265 V$

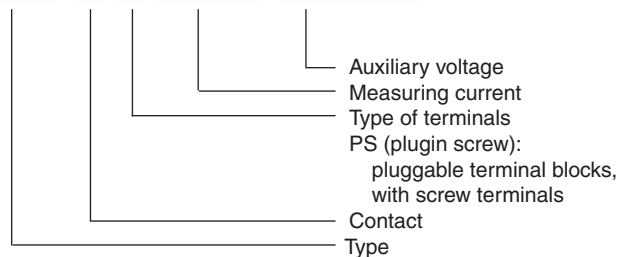
- Artikelnummer: 0067526
- Output: 2 changeover contacts
  - Auxiliary voltage  $U_H$ : DC 20 ... 265 V
  - Measuring current: 1,5 mA
  - Measuring voltage range: DC 40 ... 265 V
  - Width: 22.5 mm

UG 5124.82PS DC 20 ... 60 V 5 mA  $U_H = DC 20 \dots 265 V$

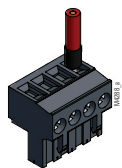
- Artikelnummer: 0067527
- Output: 2 changeover contacts
  - Auxiliary voltage  $U_H$ : DC 20 ... 265 V
  - Measuring current: 5 mA
  - Measuring voltage range: DC 20 ... 60 V
  - Width: 22.5 mm

### Ordering Example

UG 5124 .82 PS DC 1,5 mA DC 20 ... 265 V

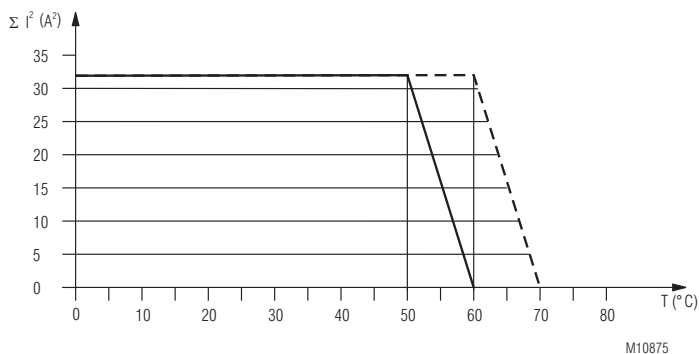


### Option with Pluggable Terminal Block



Screw terminal  
(PS/plugin screw)

### Characterisiques

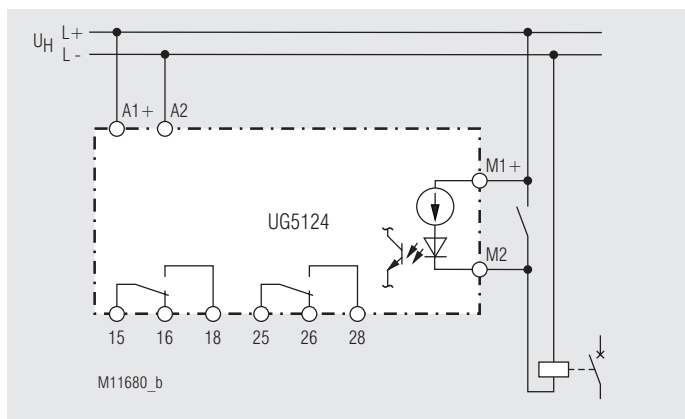


--- device mounted away from  
heat generation components.

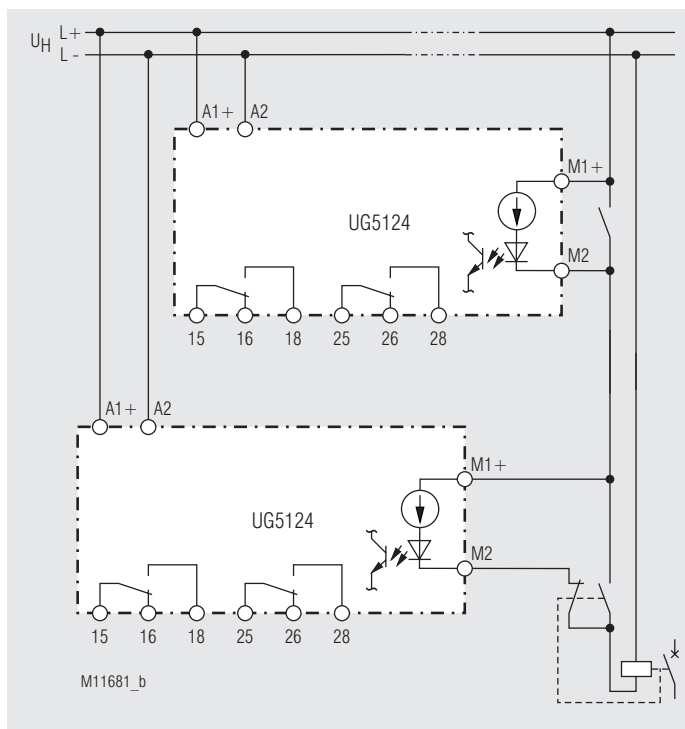
— device mounted without distance heated by  
devices with same load.

Quadratic total current limit curve

### Connection Examples



Auxiliary voltage / measuring voltage separate connection or common connection to one voltage source.



Trip circuit monitoring with NC and NO contact (auxiliary contacts) of the circuit breaker