

Current relay MK 9053 varimeter



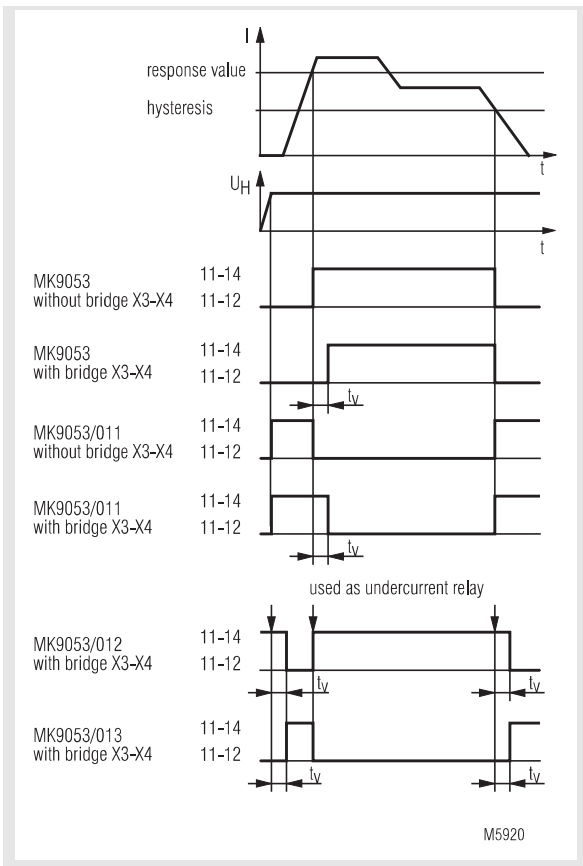
- According to IEC 255, EN 60 255, VDE 0435 part 303
- to: monitor DC and AC
- Measuring ranges from 2 mA to **25 A**
- High overload possible
- **Input frequency up to 5 kHz**
- with time delay, up to max. 100 sec
- LED indicators for operation and contact position
- optionally with remote potentiometer
- Width: 22,5 mm

Approvals and marking

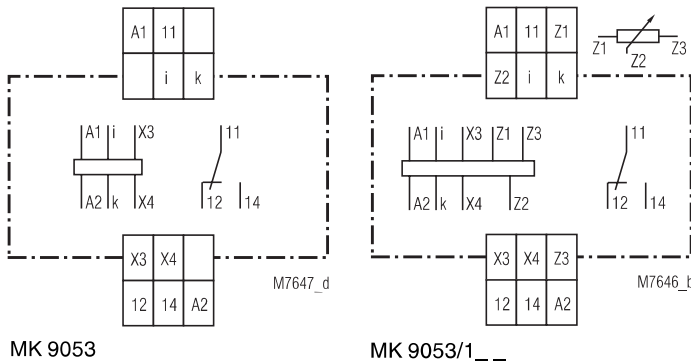


* see Variants

Function diagram



Circuit diagrams



Applications

Monitoring current in AC or DC systems

Function

The MK 9053 measure the arithmetic mean value of the rectified measuring current. The AC units are adjusted to the r.m.s value. They have settings for response value and hysteresis. The unit work as overcurrent relays but can also be used for undercurrent detection. The hysteresis is dependent on the response value. A fixed time delay can be activated by linking terminals X3-X4.

Indicators

green upper LED: on, when auxiliary supply connected
yellow lower LED: on, when output relay activated

Technical data

Input

MK 9053 with 1 Measuring range				
Measuring* range AC or DC	internal resistance	max. permissible continuous current		max. permiss. current 3 s
		devices mounted without distance	with 5 mm distance	
2 - 20 mA	1,5 Ω	0,5 A	0,7 A	1 A
20 - 200 mA	0,15 Ω	1,5 A	2 A	4 A
30 - 300 mA	0,1 Ω	2 A	2,5 A	8 A
50 - 500 mA	0,1 Ω	2 A	2,5 A	8 A
0,1 - 1 A	30 mΩ	3,5 A	5 A	10 A
0,5 - 5 A	6 mΩ	8 A	11 A	20 A
1 - 10 A	3 mΩ	12 A	15 A	20 A

*DC or AC current 50 ... 5000 Hz
(to be ordered)

Extending of measuring range:

For DC-current higher then the highest measuring range the voltage relay BA 9054 or MK 9054 measuring range 15 ... 150 mV can be used together with secondary winding of 150 mV. The nominal load of the CT should be $\geq 2,5$ VA.

Measuring principle: Adjustment:

arithmetic mean value
The AC - devices can also monitor DC current. The scale offset in this case is: $(\bar{I} = 0,90 I_{eff})$

Temperature influence:

$< 0,05 \% / K$

Technical data

Setting ranges

Setting:

Response value:	infinite variable $0,1 I_N \dots 1 I_N$ relative scale
Hysteresis:	infinite variable $0,5 \dots 0,98$ of setting value
Accuracy:	$\leq \pm 0,5 \%$
Time delay t_v	approx. 1 s or 5 s, fixed The units are delivered with a bridge between terminals X3 - X4. If this bridge is removed the time delay is inactive.

Auxiliary circuit

Auxiliary voltage U_H :	AC 24, 42, 110, 127, 230 V
Voltage range:	$0,8 \dots 1,1 U_H$
Nominal consumption:	approx. 2 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	$\pm 5 \%$

Output

Contacts:	1 changeover contact
Thermal current I_{th} :	5 A
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
Electrical life	
to AC 15 at 3 A, AC 230 V:	10^5 switching cycles IEC/EN 60 947-5-1
Short-circuit strength	
max. fuse rating:	6 AgL IEC/EN 60 947-5-1
Mechanical life:	30×10^6 switching cycles

General data

Operating mode:	Continuous operation
Temperature range:	$-20 \dots +50^\circ\text{C}$
Clearance and creepage distances	
overvoltage category / contamination level	
Input / Output	4 kV / 2 IEC 60 664-1
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	10 V/m IEC/EN 61 000-4-3
Fast transients:	4 kV IEC/EN 61 000-4-4
Surge voltages	
between	
wires for power supply:	2 kV IEC/EN 61 000-4-5
between wire and ground:	4 kV IEC/EN 61 000-4-5
Interference suppression:	Limit value class B EN 55 011
Degree of protection	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0,35 mm frequency $10 \dots 55$ Hz IEC/EN 60 068-2-6
Climate resistance:	20 / 050 / 04 IEC/EN 60 068-1
Terminal designation:	EN 50 005
Wire connection:	$2 \times 1,5 \text{ mm}^2$ solid or $2 \times 1 \text{ mm}^2$ stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Wire fixing:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Mounting:	DIN rail IEC/EN 60 715
Weight:	160 g

Dimensions

Width x height x depth:	22,5 x 82 x 102 mm
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Standard types

MK 9053 AC 0,5 ... 5 A AC 230 V 1 s	
Article number:	0026784 stock item
• for Overcurrent monitoring	
• Measuring range:	AC 0,5 ... 5 A
• Auxiliary voltage U_H :	AC 230 V
• Time delay by I_{an} :	1 s
• Width:	22,5 mm
MK 9053/012 AC 0,5 ... 5 A AC 230V 1 s	
Article number:	0027151 stock item
• for Undercurrent monitoring	
• Measuring range:	AC 0,5 ... 5 A
• Auxiliary voltage U_H :	AC 230 V
• time delay by I_{ab} :	1 s
• Width:	22,5 mm

Variants

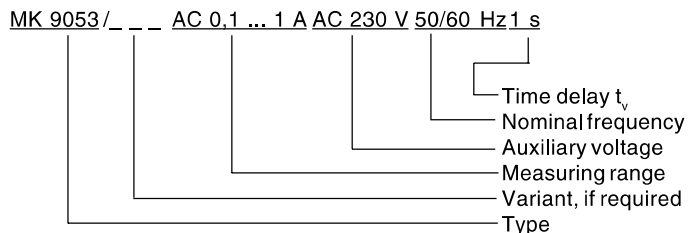
MK 9053/61:	with UL-approval (Canada/USA)
MK 9053/_11:	deenergised on overcurrent
MK 9053/_13:*	energised on undercurrent
MK 9053/0__:	standard version without remote potentiometer
MK 9053/1__:	connection of remote potentiometer for 470 k Ω

The connection of the remote potentiometer should be wired separately from other wires with AC voltage. If this is not possible a screened cable is recommended. The screen must be connected to terminal i.

A twisted pair cable also increases interference immunity. The wire should not be longer than 10 m.

* The unit MK 9053/_13 is normally used for undercurrent. The delay starts when the current drops under the hysteresis value.

Ordering example for Variants



Accessories

for MK 9053	
ET 4752-143:	Marking plate
AD 3:	Remote potentiometer 470 K Ω (article number 0050174)

Setting

Example:

Current relay MK 9053 AC 0,5 ... 5 A

AC according to type plate:

i.e. the unit is calibrated for AC

0,5 ... 5 A = measuring range

Response value AC 3 A

Hysteresis AC 1,5 A

Settings:

upper potentiometer: 0,6 (0,6 x 5 = 3 A)

lower potentiometer: 0,5 (0,5 x 3 = 1,5 A)

The AC _devices can also monitor DC current. The scale offset in this case is: $I = 0,90 \times I_{\text{eff}}$

AC 0,5 ... 5 A is equivalent to DC 0,45 ... 4,5 A

Response value DC 3 A

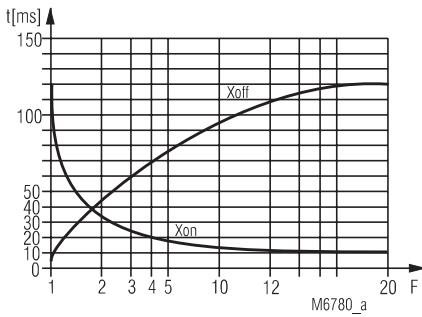
Hysteresis DC 1,5 A

Settings:

upper potentiometer: 0,66 (0,66 x 4,5 = 3 A)

lower potentiometer: 0,5 (0,5 x 3 = 1,5 A)

Characteristics



Switching delay

The characteristic shows the switching delay depending on the values of $X_{\text{on}} - X_{\text{off}}$ when switching the current on or off. A slow current change reduces the delay.

$$F = \frac{I_{\text{applied}}}{I_{\text{setting}}}$$