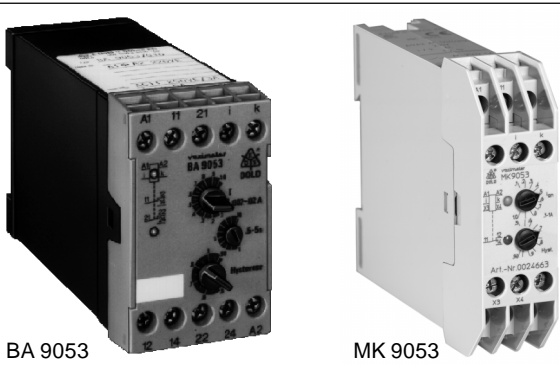


Current relay BA 9053, MK 9053 varimeter

0221540

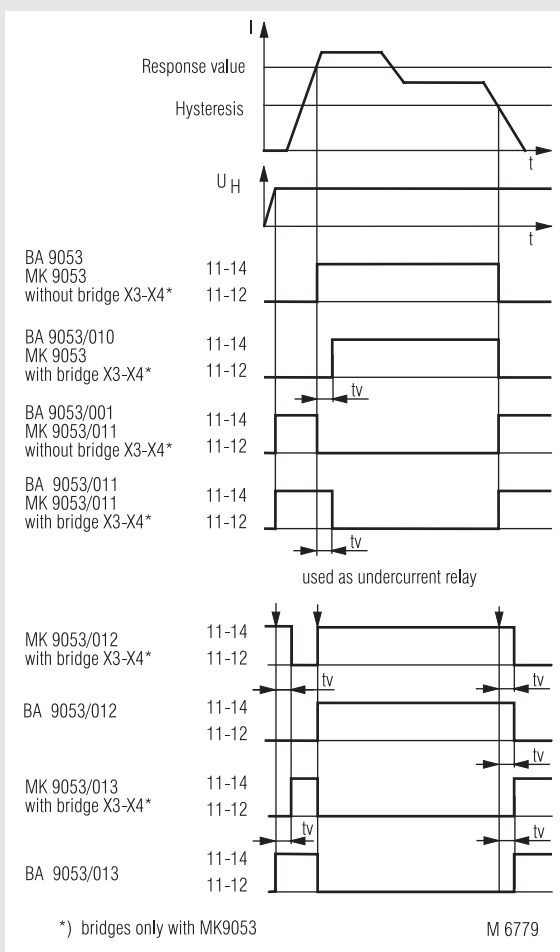


BA 9053

MK 9053

- According to IEC 255, VDE 0435 part 303
- One model for AC and DC current
- Measuring ranges from 2 mA to 25 A
- BA 9053 optionally with 3 current ranges 0,1 to 10 A
- BA 9053 optionally with safe separation to VDE 0106 part 101
- BA 9053 optionally with galvanic separated DC auxiliary supply
- MK 9053 optionally with remote potentiometer
- Open circuit operation
- Optionally closed circuit operation
- High overload possible
- Permissible frequency range of the measuring current up to 400 Hz
- Optionally with time delay
- LED indicators for operation and contact position
- Width MK 9053: 22,5 mm
- Width BA 9053: 45 mm

Function diagram



Approvals and marking



Applications

Monitoring current in AC or DC systems

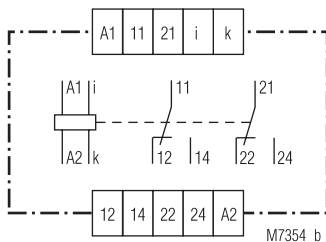
Function

The relays 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 units work as overcurrent relays but can also be used for undercurrent detection. The hysteresis is dependent on the response value. The BA 9053 is optionally available with time delay. On the MK 9053 a fixed time delay can be activated by linking terminals X3-X4.

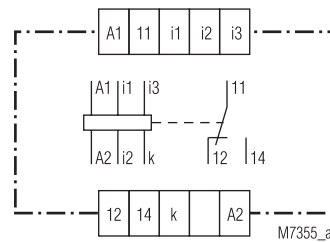
Indicators

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

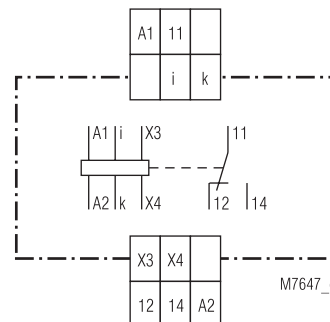
Circuit diagrams



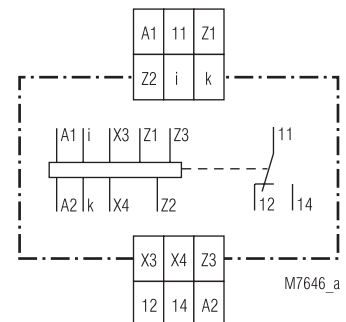
BA 9053



BA 9053/430
BA 9053/4__:
Terminals i1/k: 0,1 ... 1 A
Terminals i2/k: 0,5 ... 5 A
Terminals i3/k: 1 ... 10 A



MK 9053



MK 9053/100

Technical data

Input

BA 9053			
Measuring* range	internal resistance	max. permissible continuous current	max. permiss. current for 3 s on 100 s off
2 - 20 mA	1,5 Ω	0,7 A	1 A
20 - 200 mA	0,15 Ω	2,0 A	5 A
30 - 300 mA	0,1 Ω	2,5 A	8 A
50 - 500 mA	0,1 Ω	2,5 A	8 A
0,1 - 1 A	40 mΩ	5 A	15 A
0,5 - 5 A	13 mΩ	10 A	30 A
1 - 10 A	8 mΩ	15 A	40 A
1,5 - 15 A	4 mΩ	25 A	40 A
2 - 20 A	4 mΩ	25 A	40 A
2,5 - 25 A	4 mΩ	25 A	40 A

* DC or AC current 50 ... 400 Hz

BA 9053/4 __: Terminal i1/k: 0,1 ... 1A
Terminal i2/k: 0,5 ... 5A
Terminal i3/k: 1 ... 10A

MK 9053				
Measuring* range	internal resistance	max. permissible continuous current		max. permissible 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 ... 60 Hz

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 1 A or 5 A is used together with BA 9053 or MK 9053. The nominal load of the CT should be $\geq 2,5$ VA.

Measuring principle:

Adjustment:

arithmetic mean value
DC units are adjusted to the DC-current mean value, AC units to the r.m.s value. It ist possible to use AC units to measure DC and the other way round. The scaling is the shifted by the factor:

$$(I_{r.m.s} = 1,1 \bar{I}; \bar{I} = 0,9 I_{r.m.s})$$

Temperature influence:

< 0,05 % / K

Setting ranges

Setting:

Response value:

infinite variable 0,1 I_N ... 1 I_N
relative scale

Hysteresis:

infinite variable 0,5 ... 0,98 of setting value
 $\leq \pm 5$ %

Accuracy:

Time delay t_v

BA 9053: infinite variable from 0,5 - 5 sec only with BA 9053/010, BA 9053/011, BA 9053/012, BA 9053/013

MK 9053:

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.

Technical data

Auxiliary circuit

Auxiliary voltage U_H :

BA 9053: AC 24, 42, 110, 127, 230 V
AC/DC 24 ... 60 V, AC/DC 110 ... 230 V
MK 9053: AC 24, 42, 110, 127, 230 V
0,8 ... 1,1 U_H

Voltage range:

Nominal consumption:

BA 9053: ca. 2,5 VA

MK 9053: ca. 2 VA

Nominal frequency: 50 / 60 Hz

Frequency range: ± 5 %

Output

Contacts

BA 9053: 2 changeover contacts

MK 9053: 1 changeover contact

Thermal current I_{th} :

Switching capacity

to AC 15:

NO contact (MK9053): 3 A / AC 230 V EN 60 947-5-1

NC contact (MK 9053): 1 A / AC 230 V EN 60 947-5-1

Electrical life

to AC 15 at 3 A, AC 230 V: 10^5 switching cycles EN 60 947-5-1

Short-circuit strength

max. fuse rating: 6 AgL EN 60 947-5-1

Mechanical life: 30 x 10^6 switching cycles

General data

Operating mode: Continuous operation

Temperature range:

BA 9053

≤ 10 A: -20 ... +60°C

≥ 15 A: -20 ... +50°C

MK 9053: -20 ... +60°C

Clearance and creepage distances

overvoltage category /
contamination level: 4 kV / 2 DIN VDE 0110-1 (04.97)

EMC

Electrostatic discharge: 8 kV (air) EN 61 000-4-2

HF irradiation: 10 V/m EN 61 000-4-3

Fast transients

BA 9053: 2 kV EN 61 000-4-4

MK 9053: 4 kV EN 61 000-4-4

Surge voltages

between

wires for power supply: 2 kV EN 61 000-4-5

between wire and ground: 4 kV EN 61 000-4-5

Interference suppression: Limit value class B EN 55 011

Housing: IP 40 EN 60 529

Terminals: IP 20 EN 60 529

Housing: Thermoplastic with V0 behaviour

according to UL subject 94

Vibration resistance: Amplitude 0,35 mm

frequency 10 ... 55 Hz EN 60 068-2-6

Climate resistance

BA 9053

≤ 10 A: 20 / 060 / 04 EN 60 068-1

≥ 15 A: 20 / 050 / 04 EN 60 068-1

MK 9053: 20 / 060 / 04 EN 60 068-1

Terminal designation:

EN 50 005

Wire connection

BA 9053: 2 x 2,5 mm² solid or
2 x 1,5 mm² stranded wire with sleeve

DIN 46 228-1/-2/-3/-4

MK 9053: 2 x 1,5 mm² solid or

2 x 1 mm² stranded wire with sleeve

DIN 46 228-1/-2/-3/-4

Wire fixing: Flat terminals with self-lifting

clamping piece EN 60 999

Mounting: DIN rail EN 50 022

Weight:

BA 9053: 270 g

MK 9053: 160 g

Technical data

Dimensions

Width x height x depth

BA 9053:	45 x 73 x 132 mm
MK 9053:	22,5 x 82 x 102 mm

Standard types

BA 9053 AC 0,5 ... 5 A AC 230 V

Article number:	0026784	stock item
• Measuring range:	AC 0,5 ... 5 A	
• Auxiliary voltage U_H :	AC 230 V	
• Without time delay		
• Open circuit operation		
• Width:	45 mm	

MK 9053 AC 0,5 ... 5 A AC 230 V 1 s

Article number:	0026784	stock item
• Measuring range:	AC 0,5 ... 5 A	
• Auxiliary voltage U_H :	AC 230 V	
• Time delay:	1 s	
• Open circuit operation		
• Width:	22,5 mm	

Variants

BA 9053.12/61:	with UL-approval
BA 9053/001:	closed circuit operation
BA 9053/010:	open circuit operation with time delay at I_{an}
BA 9053/011:	closed circuit operation with time delay at I_{an}
BA 9053/012*:	closed circuit operation with time delay at I_{ab}
BA 9053/013*:	open circuit operation with time delay at I_{ab}
BA 9053/2__:	safe separation according to VDE 0106 part 101. aux. supply / measuring circuit: 4 kV / II aux. supply / contacts: 6 kV / II measuring circuit / contacts: 6 kV / II
BA 9053/3__:	10 μ m goldplated contacts
BA 9053/4__:	3 measuring ranges 0,1 ... 1 A; 0,5 ... 5 A; 1 ... 10 A
BA 9053/430:	3 measuring ranges, adjustable operate delay of approx. 20 ms to 30 sec open circuit operation with time delay at I_{on} , safe separation according to VDE 0106 part 101.

* The units BA/MK 9053/012 and BA/MK 9053/013 can be used as undercurrent relays. The delay starts when the inputs signal drops below the hysteresis value.

MK 9053/61:	with UL-approval (Canada/USA)
MK 9053/011:	closed circuit operation
MK 9053/012*:	closed circuit operation
MK 9053/013*:	open circuit operation
MK 9053/1__:	connection of remote potentiometer with 470 k Ω (Article number 50 174)

Ordering example for Variants

BA 9053/___	AC 1 ... 10 V	AC 24 V	50/60Hz	0,5 ... 5 s	
					Time delay
					Nominal frequency
					Auxiliary supply
					Measuring range
					Variant, if required
					Type

MK 9053/___	DC 0,1 ... 1 A	AC 230 V	50/60Hz	1 s	
					Time delay
					Nominal frequency
					Auxiliary supply
					Measuring range
					Variant, if required
					Type

Accessories

for MK 9053
ET 4752-143: Marking plate

Setting

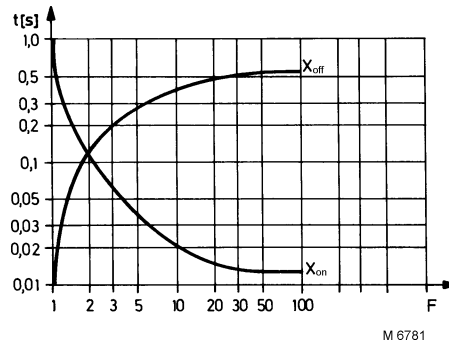
Example:
Current relay BA 9053 / MK 9053 AC 0,1 ... 1 A

AC according to type plate:
i.e. the unit is adjusted to AC voltage
0,1 ... 1 A = measuring range

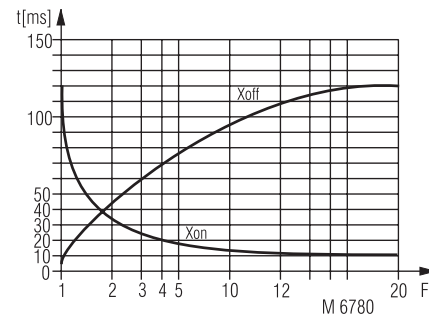
setting on upper potentiometer: 0,6
setting on lower potentiometer: 0,5

response value = 0,6 x 1 A = 0,6 A
release value = 0,5 x 0,6 A = 0,3 A

Characteristics



BA 9053



MK 9053

Switching delay

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

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

