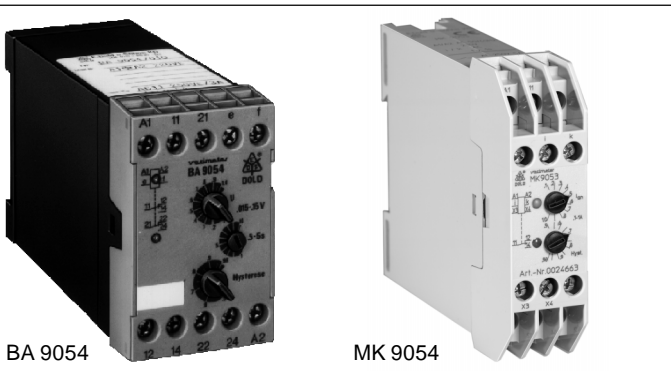


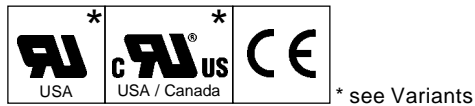
Voltage relay BA 9054, MK 9054 varimeter

0221541



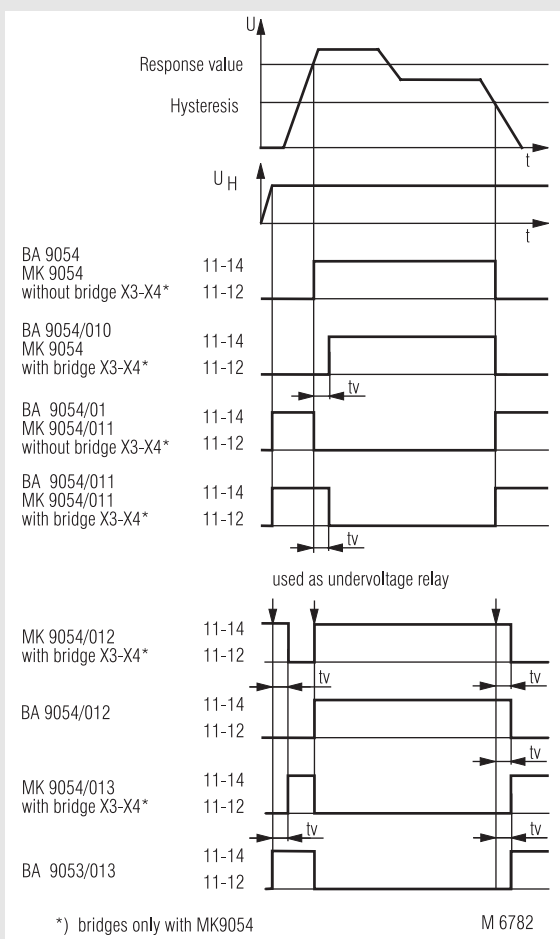
- According to IEC 255, VDE 0435 part 303
- One model for AC and DC voltages
- Measuring ranges from 15 mV to 500 V
- BA 9054 optionally with galvanic separated DC auxiliary supply
- MK 9054 optionally with remote potentiometer
- Open circuit operation
- Optionally closed circuit operation
- High overload possible
- Permissible frequency range of the measuring voltage: 50 ... 400 Hz
- Optionally with time delay
- LED indicators for operation and contact position
- Width MK 9054: 22,5 mm
- Width BA 9054: 45 mm

Approvals and marking



* see Variants

Function diagram



Applications

Monitoring voltage in AC or DC systems

Function

The relays measure the arithmetic mean value of the rectified measuring voltage. The AC units are adjusted to the r.m.s value. They have settings for response value and hysteresis. The units work as overvoltage relays but can also be used for undervoltage detection. The hysteresis is dependent on the response value. The BA 9054 is optionally available with time delay. On the MK 9054 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

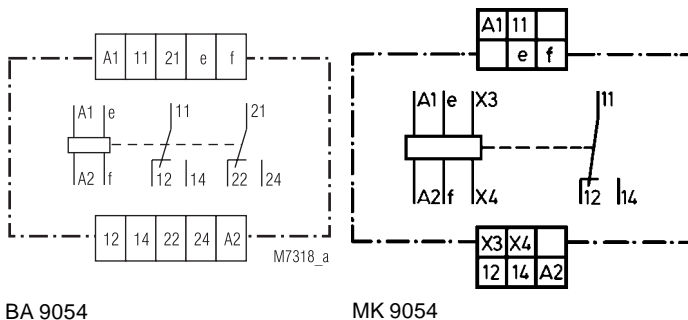
Technical data

Input

BA 9054		
Measuring range ¹⁾	internal resistance	max. permissible continuous voltage
15 - 150 mV	40 kΩ	6 V
50 - 500 mV	270 kΩ	20 V
0,5 - 5 V	330 kΩ	200 V
5 - 50 V	2 MΩ	500 V ²⁾
25 - 250 V	2 MΩ	500 V ²⁾
50 - 500 V	2 MΩ	500 V ²⁾

¹⁾ DC or AC voltage 50 ... 400 Hz
²⁾ at Overvoltage category II: 600 V

Circuit diagrams



MK 9054		
Measuring range ¹⁾	internal resistance	max. permissible continuous voltage
15 - 150 mV	40 kΩ	100 V
50 - 500 mV	270 kΩ	250 V
0,5 - 5 V	500 kΩ	300 V
1 - 10 V	1 MΩ	300 V
5 - 50 V	2 MΩ	600 V ²⁾
25 - 250 V	2 MΩ	600 V ²⁾
50 - 500 V	2 MΩ	600 V ²⁾

¹⁾ DC or AC voltage 50 ... 60 Hz
²⁾ at Overvoltage category II: 600 V

Technical data

Please note:

To avoid measuring mistakes, on units with mV input the input must always be terminated. In addition screened wires should be used.

Measuring principle:	arithmetic mean value
Adjustment:	DC units are adjusted to the DC-voltage mean value, AC units to the r.m.s value. It is possible to use AC units to measure DC and the other way round. The scaling is shifted by the factor: ($U_{r.m.s} = 1,1 \bar{U} : \bar{U} = 0,9 U_{r.m.s}$)
Temperature influence:	< 0,05 % / K

Setting ranges

Setting:	
Response value:	infinite variable $0,1 U_N \dots 1 U_N$ relative scale
Hysteresis:	infinite variable 0,5 ... 0,98 of setting value
Accuracy:	$\leq \pm 5 \%$
Time delay t_d:	
BA 9054:	infinite variable from 0,5 ... 5 s only with BA 9054/010, BA 9054/011, BA 9054/012, BA 9054/013 other values on request
MK 9054:	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:	
BA 9054:	AC 24, 42, 110, 127, 230 V AC/DC 24 ... 60 V, AC/DC 110 ... 230 V
MK 9054:	AC 24, 42, 110, 127, 230 V
Voltage range:	0,8 ... 1,1 U_H
Nominal consumption:	
BA 9054:	approx. 2,5 VA
MK 9054:	approx. 2,0 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	$\pm 5 \%$

Output

Contacts	
BA 9054.12:	2 changeover contacts
MK 9054:	1 changeover contact
Thermal current I_{th}:	5 A
Switching capacity	
to AC 15:	
NO contact (MK9054):	3 A / AC 230 V EN 60 947-5-1
NC contact (MK 9054):	1 A / AC 230 V EN 60 947-5-1
Electrical life	EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	10^5 switching cycles
Short-circuit strength	
max. fuse rating:	6 AgL EN 60 947-5-1
Mechanical life:	30×10^6 switching cycles

General data

Operating mode:	Continuous operation
Temperature range:	
BA 9054:	- 40 ... + 60°C
MK 9054:	- 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:	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

Technical data

Degree of protection:	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 9054:	40 / 060 / 04 EN 60 068-1
MK 9054:	20 / 060 / 04 EN 60 068-1
Terminal designation:	EN 50 005
Wire connection	
BA 9054:	2 x 2,5 mm ² solid or 2 x 1,5 mm ² stranded wire with sleeve DIN 46 228-1/-2/-3/-4
MK 9054:	2 x 1,5 mm ² solid or 2 x 1 mm ² stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Wire fixing:	Flat terminals with self-lifting clamping piece EN 60 999
	DIN rail EN 50 022
Mounting:	
Weight:	
BA 9054:	270 g
MK 9054:	160 g

Dimensions

Width x height x depth	
BA 9054:	45 x 73 x 132 mm
MK 9054:	22,5 x 82 x 102 mm

Standard types

BA 9054 AC 25 ... 250 V AC 230 V	
Article number:	0029191
• Measuring range:	AC 25 ... 250 V
• Auxiliary voltage U_H :	AC 230 V
• Without time delay	
• Open circuit operation	
• Width:	45 mm
MK 9054 AC 25 ... 250 V AC 230 V 1 s	
Article number:	0026686 stock item
• Measuring range:	AC 25 ... 250 V
• Auxiliary voltage U_H :	AC 230 V
• Time delay:	1 s
• Open circuit operation	
• Width:	22,5 mm

Variants

BA 9054.12/61:	with UL-approval
BA 9054/001:	closed circuit operation
BA 9054/010:	open circuit operation with time delay at U_{an}
BA 9054/011:	closed circuit operation with time delay at U_{an}
BA 9054/012*:	closed circuit operation with time delay at U_{ab}
BA 9054/013*:	open circuit operation with time delay at U_{off}

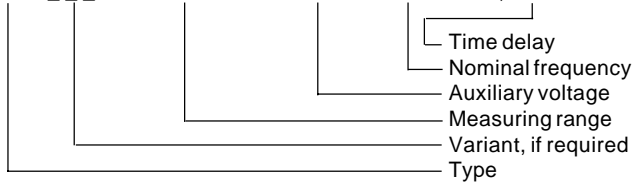
The units BA/MK 9054/012 and BA/MK 9054/013 can be used as undervoltage relays. The delay starts when the inputs signal drops below the setting value.

MK 9054/61:	with UL-approval (Canada/USA)
MK 9054/011:	closed circuit operation
MK 9054/012*:	closed circuit operation
MK 9054/013*:	open circuit operation
MK 9054/1__:	connection of remote potentiometer with 470 k Ω

Variants

Ordering example for Variants

BA 9054/... AC 25 ... 250 V AC 24 V 50/60Hz 0,5 ... 5 s



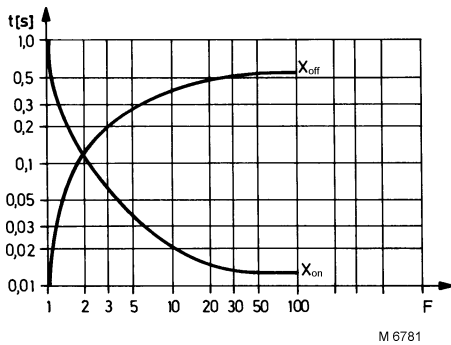
Accessories

for MK 9054

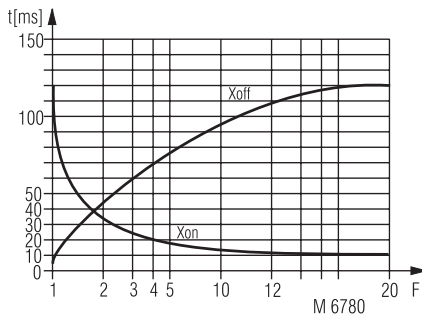
ET 4752-143:

Marking plate

Characteristics



BA 9054



MK 9054

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.

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

Setting

Example:

Voltage relay BA 9054 / MK 9054 AC 25 ... 250 V

AC according to type plate:

i.e. the unit is adjusted to AC voltage

25 ... 250 V = measuring range

setting on upper potentiometer: 0,6

setting on lower potentiometer: 0,5

response value = $0,6 \times 250 \text{ V} = 150 \text{ V}$

release value = $0,5 \times 150 \text{ V} = 75 \text{ V}$

