

Monitoring technique

Voltage relay BA 9054, MK 9054 varimeter

Now available with new features



0221541



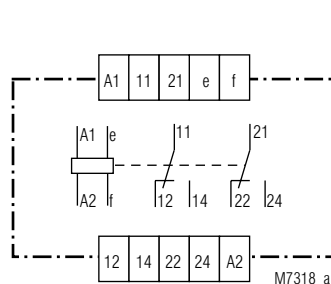
BA 9054



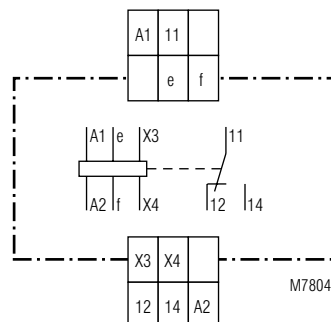
MK 9054

- According to IEC 255, EN 60 255, VDE 0435 part 303
- to monitor DC and AC voltage
- Measuring ranges from 15 mV to 500 V
- BA 9054 optionally with galvanic separated DC auxiliary supply
- MK 9054 optionally with remote potentiometer
- High overload possible
- **Input frequency up to 5 kHz**
- with time delay
- **BA 9054as option with start-up delay**
- **BA 9054 as option with manual reset**
- LED indicators for operation and contact position
- Width MK 9054: 22,5 mm
- Width BA 9054: 45 mm

Circuit diagrams



BA 9054



MK 9054

Approvals and marking



* see Variants

Applications

Monitoring voltage in AC or DC systems

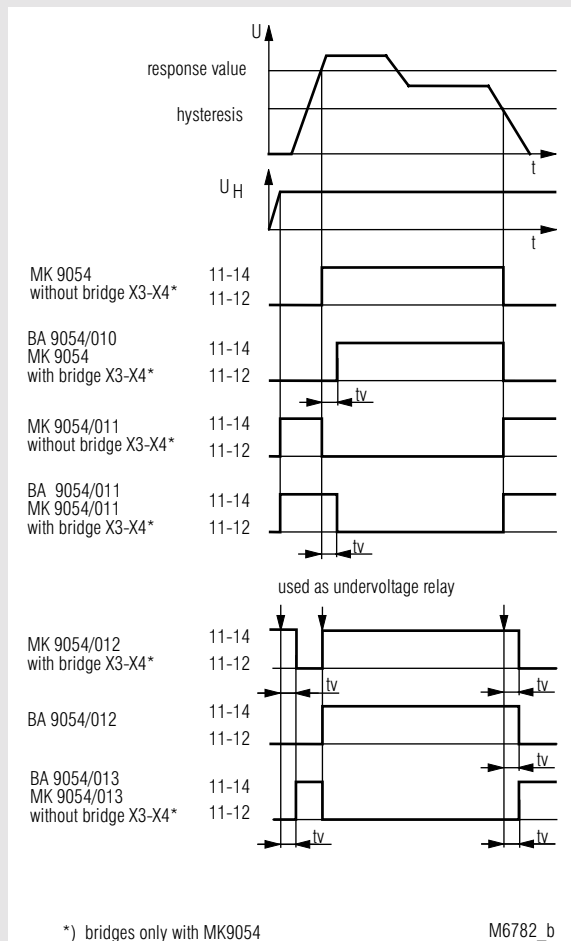
Function

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.

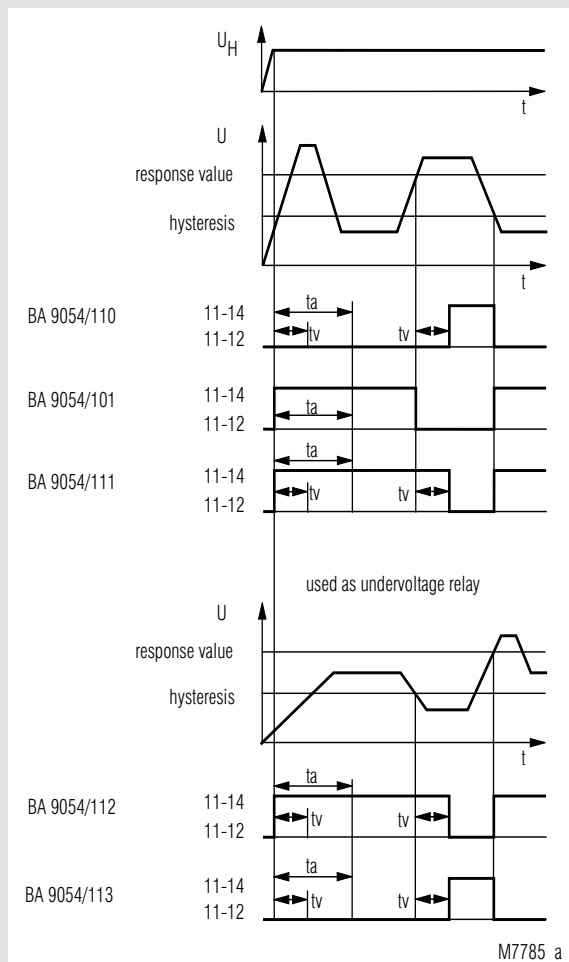
Indicators

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

Function diagram without start-up delay



Function diagram with start-up delay



On model BA 9054/6__ with manual reset the contacts remain in the fault state after detecting a fault or after to has elapsed. The contacts are reset by disconnecting the supply voltage.

Technical data

Input

BA 9054 with 1 Measuring range for AC and DC			
Measuring range ¹⁾		internal resistance	max. permissible continuous voltage
AC	DC		
15 - 150 mV	13,5 - 135 mV	40 kΩ	100 V
50 - 500 mV	45 - 450 mV	270 kΩ	250 V
0,5 - 5 V	0,45 - 4,5 V	500 kΩ	300 V
1 - 10 V	0,9 - 9,0 V	1 kΩ	300 V
5 - 50 V	4,5 - 45 V	2 MΩ	500 V ²⁾
25 - 250 V	22,5 - 225 V	2 MΩ	500 V ²⁾
50 - 500 V	45 - 450 V	2 MΩ	500 V ²⁾
70 - 700 V ³⁾	63 - 630 V	3 kΩ	700 V ⁴⁾

¹⁾ DC or AC voltage 50 ... 5000 Hz
(Other frequency ranges of 10 ... 5000 Hz, e. g. 16 ²/₃ Hz, on request)

²⁾ at Overvoltage category II: 600 V

³⁾ only with BA 9054/ _20; / _21; / _22; / _23; / _24
(model: 1 changeover contact, auxiliary voltage U_H: AC 24, 110, 127, 230, 400 V)

⁴⁾ at overvoltage category II: 1000 V

MK 9054 with 1 Measuring range		
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	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 ... 60 Hz (to be ordered)

²⁾ at Overvoltage category II: 600 V

Please note:

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

Technical data	
Measuring principle:	arithmetic mean value
Adjustment:	The AC-devices can also monitor DC-voltage. The scale offset in this case is: ($\bar{U} = 0,90 U_{eff}$)
Temperature influence:	< 0,05 % / K
Setting ranges	
Setting:	
Response value:	infinite variable 0,1 U_N ... 1 U_N relative scale
Hysteresis:	infinite variable 0,5 ... 0,98 of setting value
Accuracy:	$\leq \pm 5 \%$
Time delay t_v	
BA 9054:	infinite variable at logarithmic scale from 0 - 20 s, 0 - 30 s, 0 - 60 s, 0 - 100 s only with BA 9054/_10, BA 9054/_11, BA 9054/_12, BA 9054/_13
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
Start-up delay	
BA 9054/1__:	1 ... 20 s; 1 ... 60 s; 1 ... 100 s, adjustable on logarithmic scale. t_a is started by connecting the auxiliary supply. During start-up time the contact is in "good" state.
Auxiliary circuit	
Auxiliary voltage U_H:	
BA 9054:	AC 24, 110, 127, 230, 400 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:	2 changeover contacts
MK 9054:	1 changeover contact
Thermal current I_{th}	
BA 9054:	2 x 5 A or 1 x 8 A
MK 9054:	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	
to AC 15 at 3 A, AC 230 V:	EN 60 947-5-1
BA 9054:	5 x 10 ⁵ switching cycles
MK 9054:	10 ⁵ switching cycles
Short-circuit strength	
max. fuse rating:	6 AgL EN 60 947-5-1
Mechanical life	
BA 9054:	50 x 10 ⁶ switching cycles
MK 9054:	30 x 10 ⁶ switching cycles

Technical data	
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 IEC 60 664-1
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
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
Climate resistance:	frequency 10 ... 55 Hz EN 60 068-2-6
Terminal designation:	20 / 060 / 04 EN 60 068-1
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
Mounting:	DIN rail EN 50 022
Weight:	
BA 9054:	AC-device: 270 g AC/DC-device: 200 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

