

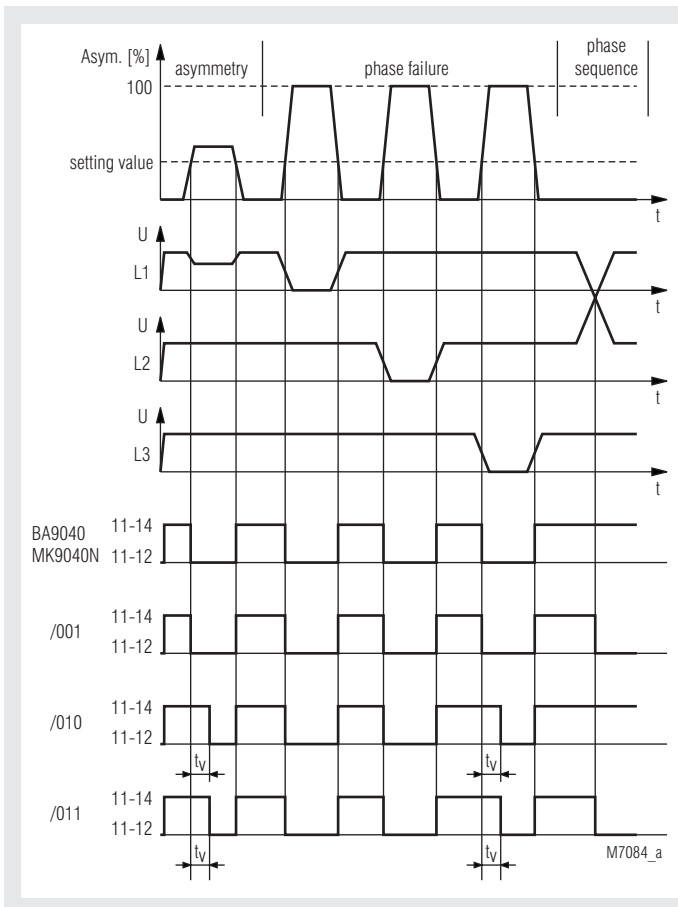
VARIMETER

Asymmetry Relay BA 9040, MK 9040N



- According to IEC 255, EN 60 255, VDE 0435 part 303
- Recognition of
 - voltage asymmetry
 - phase failure
 - voltage feedback
 - optionally with phase sequence recognition
- Optionally with adjustable response delay
- 2 LED displays for power supply and state of contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
 - with screw terminals
 - or with cage clamp terminals
- BA 9040: width 45 mm
- MK 9040N: width 22.5 mm

Function Diagram



Approvals and Marking



* see variants

Applications

Monitoring three-phase mains for voltage asymmetry, phase failure or incorrect phase sequence, e.g. in elevators, escalators, crane systems etc.

Indications

upper LED: on when supply voltage connected
lower LED: on when output relay energized

Technical Data

Input

Nominal voltage U_N : 3 AC 400 V
Voltage range: 0.8 ... 1.1 U_N
Nominal consumption:
 BA 9040: approx. 4.8 VA
 MK 9040N: 7 VA
Nominal frequency: 50 / 60 Hz
Frequency range: 45 ... 65 Hz
Temperature influence: < 0.05 % / K
Frequency influence: < 0.02 % / Hz

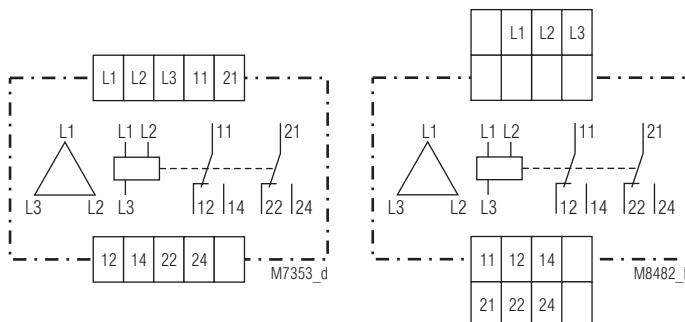
Setting Ranges

Setting range: 5 ... 15 % voltage asymmetry
Repeat accuracy: ≤ 0.5 %
Release ratio: < 4 % U_N
Voltage feedback recognition: up to 100 % - setting value, e.g. when setting value = 5 % asymmetry, 100 % - 5 % = 95 %
 Recognition of voltage feedback up to 95 %

Time delay t_v

BA 9040: 0.5 ... 5 s
 MK 9040N: 0.5 ... 10 s

Circuit Diagrams



BA 9040.12

MK 9040N.12

Technical Data

Output

Contacts	2 changeover contacts	
Response/release time:		
BA 9040:	≤ 1 s / ≤ 250 ms	
MK 9040N:	≤ 1.5 s / ≤ 250 ms	
Thermal current I_{th}:	6 A (see continuous current limit curve)	
Switching capacity to AC 15		
NO contact:	2 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		
NO contact:	1 A / DC 24 V	IEC/EN 60 947-5-1
NC contact:	1 A / DC 24 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
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances rated impuls voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
Fast transients:	2 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:	Thermoplast with V0 behaviour according to UL subject 94	
Vibration resistance:	Frequency 10 ... 55 Hz, Amplitude 0.35 mm IEC/EN 60 068-2-6	
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1	
Wire connection:	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	
Wire fixing:		
BA 9040:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1	
MK 9040N:	Box terminal with wire protection	
Mounting:	DIN rail IEC/EN 60 715	
Weight:	325 g	

Dimensions

Width x height x depth:	
BA 9040:	45 x 74 x 133 mm
MK 9040N:	22.5 x 90 x 100 mm

CSA-Data

Switching capacity:	3A 230Vac
Wire connection:	60°C / 75°C copper conductors only AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm



Technical data that is not stated in the CSA-Data, can be found in the technical data section.

CCC-Data

Thermal current I_{th}:	5 A
Switching capacity to AC 15:	2 A / AC 230 V IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V IEC/EN 60 947-5-1



Technical data that is not stated in the CCC-Data, can be found in the technical data section.

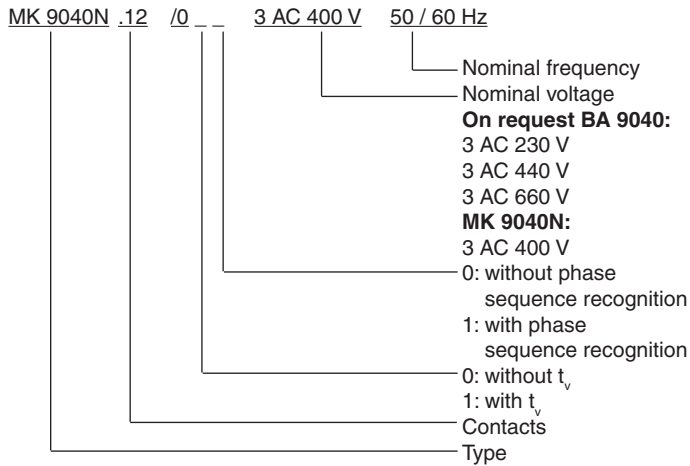
Standard Types

BA 9040.12/001	3 AC 400 V	50/60 Hz	
Article number:	0043764		stock item
• With phase sequence detection			
• Without operate delay			
• Output:	2 changeover contacts		
• Nominal voltage U _N :	3 AC 400 V		
• Width:	45 mm		
MK 9040N.12/001	3AC 400 V	50/60 Hz	
Article number:	0055712		stock item
• With phase sequence detection			
• Without operate delay			
• Output:	2 changeover contacts		
• Nominal voltage U _N :	3 AC 400 V		
• Width:	22.5 mm		

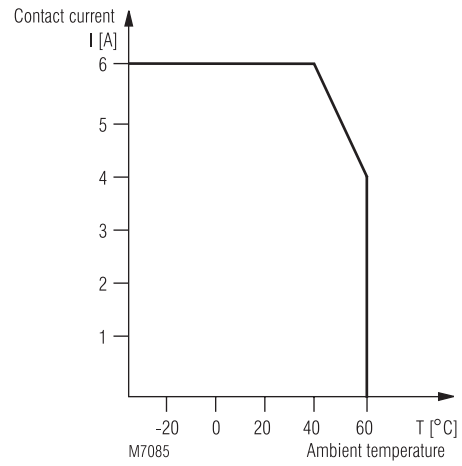
Variants

BA 9040.12/60:	with CSA approval on request
BA 9040:	with CCC approval on request
BA 9040.12/0_0:	without phase sequence detection
BA 9040.12/0_1:	with phase sequence detection
BA 9040.12/00_:	without time delay
BA 9040.12/01_:	with adjustable time delay
	t_v : 0 ... 5 s
MK 9040N.12/0_0:	without phase sequence detection
MK 9040N.12/0_1:	with phase sequence detection
MK 9040N.12/00_:	without time delay
MK 9040N.12/01_:	with adjustable time delay
	t_v : 0 ... 10 s

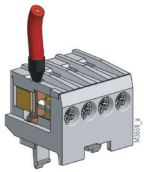
Ordering example for variants



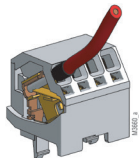
Characteristics



Options with Pluggable Terminal Blocks



Screw terminal
(PS/plugin screw)



Cage clamp
(PC/plugin cage clamp)

