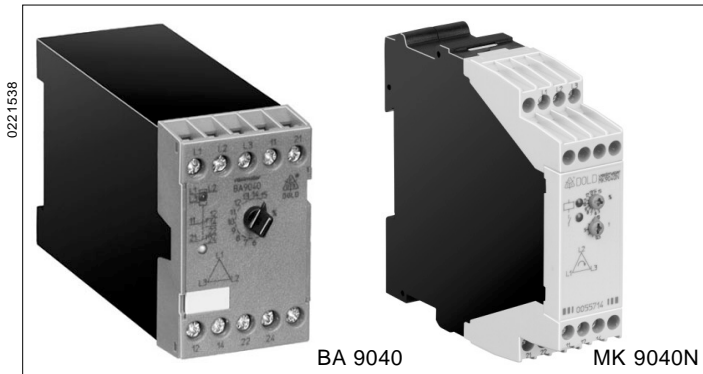


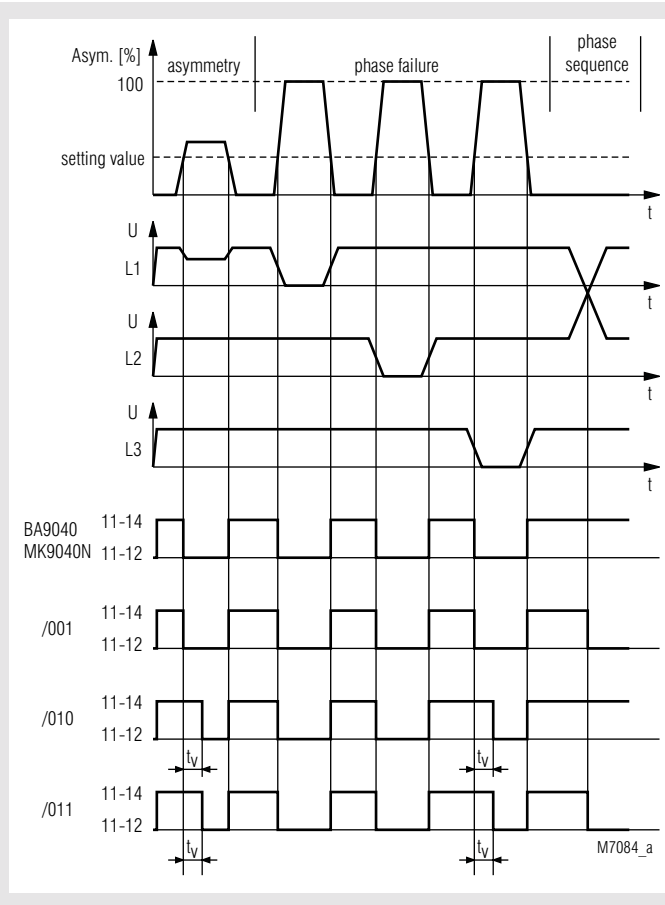
Monitoring technique

Asymmetry relay BA 9040, MK 9040N varimeter

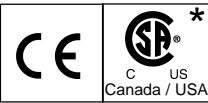


- According to IEC 255, EN 60 255, VDE 0435 part 303
- Recognition of
 - voltage asymmetry
 - phase failure
 - voltage feedback
 - optionally with phase sequence recognition
- Optionally with adjustable response delay
- Insensitive against
 - symmetric harmonics up to K-factor K 20 %
- 2 LED displays for power supply and state of contact
- BA 9040: width 45 mm
- MK 9040N: width 22,5 mm

Function diagram



Approvals and marking



* only for BA 9040 (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
Resistance of harmonics symmetric: K-factor K 20 %

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 %

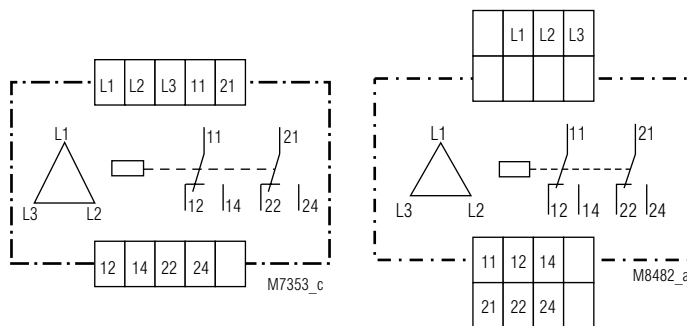
Time delay t_v

BA 9040: 0,5 ... 5 s
 MK 9040N: 0,5 ... 10 s

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)

Circuit diagram



BA 9040.12

MK 9040N.12

Technical data

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: 10⁵ 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

overvoltage category /
contamination level: 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: 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

Housing: IP 40 IEC/EN 60 529

Terminals: IP 20 IEC/EN 60 529

Degree of protection:

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

20 / 060 / 04 IEC/EN 60 068-1

Climate resistance: 2 x 2,5 mm² solid or

2 x 1,5 mm² 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

DIN rail IEC/EN 60 715

Mounting:

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

Standard type

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:

CSA/UL approval

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

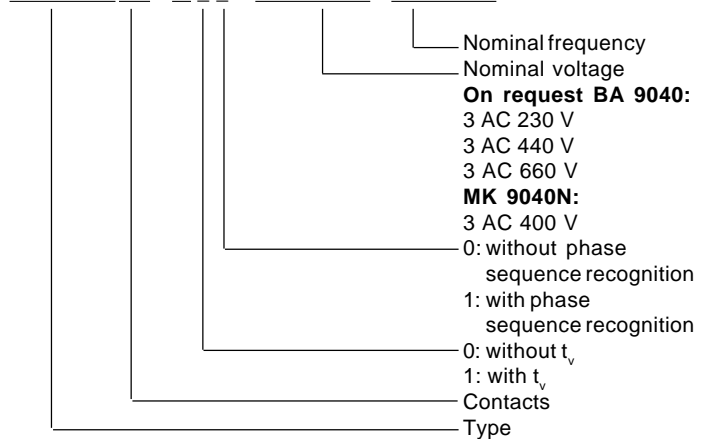
MK 9040N.12/01_:

with adjustable time delay

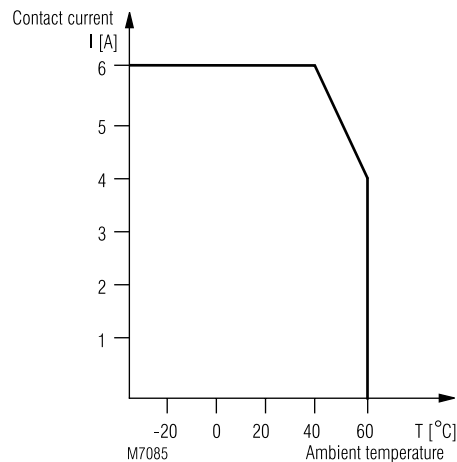
t_v: 0 ... 10 s

Ordering example for variants

MK 9040N.12 /0 _ _ 3 AC 400 V 50 / 60 Hz



Characteristics



Continuous current limit curve