

VARIMETER Asymmetry Relay MK 9040N

Translation
of the original instructions



Your Advantages

- Correct direction of rotation of drives
- Simple wiring

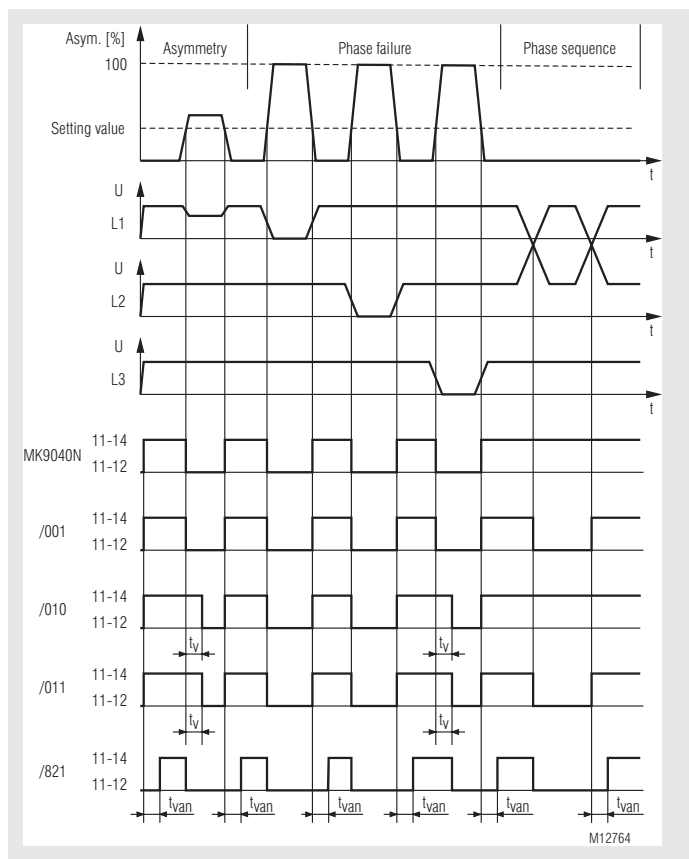
Features

- According to IEC/EN 60255-1
- 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 46228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
 - With screw terminals
 - Or with cage clamp terminals
- Width 22.5 mm

Product Description

The MK 9040N asymmetry relay of the VARIMETER series monitors asymmetry, reverse voltages, phase failure as well as incorrect phase sequence in three-phase networks. Early detection of impending failures and preventive maintenance prevent costly damage and as a user you benefit from the operational reliability and high availability of your system.

Function Diagram



Approvals and Markings



* see variants

Applications

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

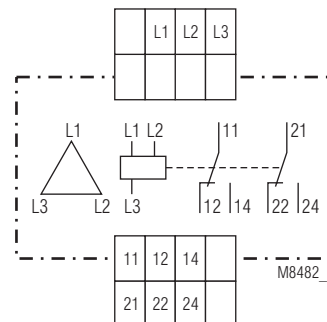
Indicators

Upper LED: On, when supply voltage connected
Lower LED: On, when output relay energized

Connection Terminals

Terminal designation	Signal description
L1, L2, L3	Connection of the monitoring 3-phase system
11, 12, 14	1. changeover contact
21, 22, 24	2. changeover contact

Circuit Diagrams



Technical Data

Input

Nominal voltage U_N:	3 AC 400 V
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	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 (constant parameters):	≤ 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:	0.5 ... 10 s, 1 ... 10 s (/821)

Output

Contacts:	2 changeover contacts
Response/release time:	≤ 1.5 s / ≤ 250 ms
Thermal current I_{th}:	6 A (see continuous current limit curve)
Switching capacity to AC 15	
NO contact:	1.5 A / AC 230 V IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60947-5-1
Electrical life: at 3 A, AC 230 V $\cos \varphi = 1$:	10 ⁵ switching cycles IEC/EN 60947-5-1
Permissible switching frequency:	6000 switching cycles / h
Short circuit strength max. fuse rating:	4 A gG / gL IEC/EN 60947-5-1
Mechanical life:	10 x 10 ⁵ switching cycles

General Data

Operating mode:	Continuous operation
Temperature range	
Operation:	- 20 ... + 60 °C
Storage:	- 20 ... + 60 °C
Altitude:	≤ 2000 m
Clearance and creepage distances	
Rated impulse voltage / pollution degree:	4 kV / 2 IEC 60664-1
Overvoltage category:	III
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61000-4-2
HF irradiation	
80 MHz ... 2.7 GHz:	10 V / m IEC/EN 61000-4-3
Fast transients:	2 kV IEC/EN 61000-4-4
Surge voltages between wires for power supply:	2 kV IEC/EN 61000-4-5
Between wire and ground:	4 kV IEC/EN 61000-4-5
HF wire guided:	10 V IEC/EN 61000-4-6
Interference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529
Housing:	Thermoplast with V0 behaviour according to UL subject 94
Vibration resistance:	Frequency 10 ... 55 Hz, Amplitude 0.35 mm IEC/EN 60068-2-6
Climate resistance:	20 / 060 / 04 IEC/EN 60068-1

Technical Data

Wire connection:	2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded wire with sleeve DIN 46228-1/-2/-3/-4
Stripping length:	10 mm
Wire fixing:	Box terminal with wire protection
Fixing torque:	0.8 Nm
Mounting:	DIN rail IEC/EN 60715
Weight:	145 g

Dimensions

Width x height x depth:	22.5 x 90 x 100 mm
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Standard Types

MK 9040N.12/001	3 AC 400 V	50/60 Hz
Article number:	0055712	
• With phase sequence detection		
• Without operate delay		
• Output:	2 changeover contacts	
• Nominal voltage U_N :	3 AC 400 V	
• Width:	22.5 mm	

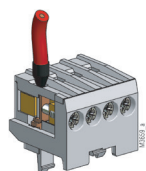
Variants

Ordering example for variants

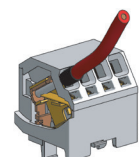
MK 9040N .12 /0 / 3 AC 400 V 50 / 60 Hz	
	Nominal frequency
	Nominal voltage
	0: Without phase sequence recognition
	1: With phase sequence recognition
	0: Without t_v
	1: With t_v
	Type of terminals without indication: Terminal blocks fixed, with screw terminals PC (plugin cageclamp): Olluggable terminal blocks with cage clamp terminals PS (plugin screw): Pluggable terminal blocks with screw terminals
	Contacts
	Type

MK 9040N.12/821:	Like MK 9040N/011, t_{van} : 1 ... 10 s The time delay t_{van} takes effect when the unit status changes from bad to good. Article number: 0062266
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Options with Pluggable Terminal Blocks

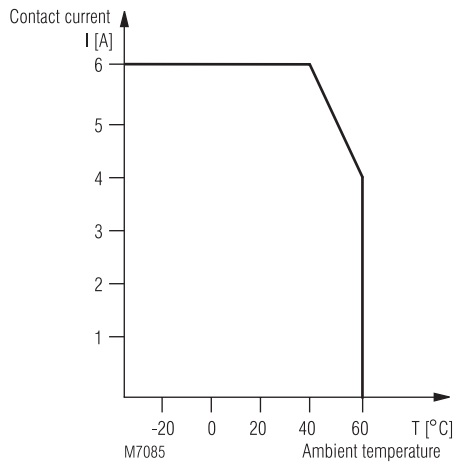


Screw terminal
(PS/plugin screw)



Cage clamp
(PC/plugin cage clamp)

Characteristic



Continuous current limit curve

