VARIMETER
Phase Sequence Relay
MK 9056N

Translation of the original instructions

0275083

MK 9056N.12/61

Your Advantage
- Correct sense of rotation of motors
- Simple wiring

Features
- According to IEC/EN 60255-1
- Detection of wrong phase sequence
- LED indication of rotation
- With up to 2 changeover contacts
- 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

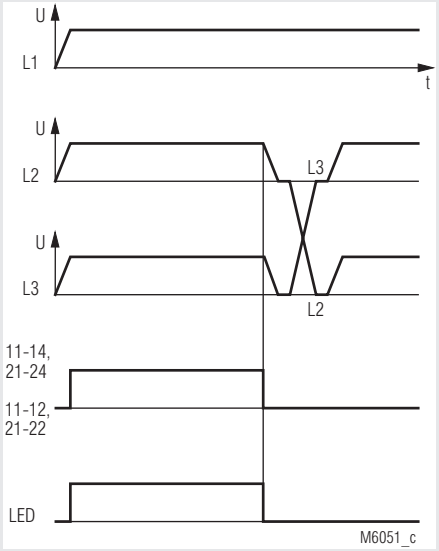
The MK 9056N detect wrong phase sequence in 3-phase systems. To monitor phase failure it is more suitable to use an Asymmetry relay e.g. MK 9040N.

Approvals and Markings

CE | 1) | UKCA | c UL US LISTED Canada / USA 2)

1) see CCC-Data
2) see variants

Function Diagram



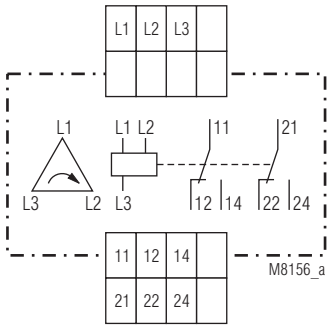
Indicators

Green LED: On, when corresponding output relay is active

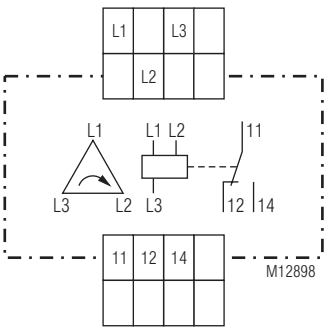
Connection Terminals

Terminal designation	Signal description
L1, L2, L3	Connection of the monitoring 3-phase system
11, 12, 14; 21, 22, 24	"incorrect phase sequence-signaling relais (changeover contacts)"

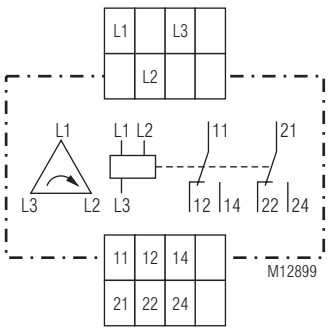
Circuit Diagram



MK 9056N.12



MK 9056N.11/61



MK 9056N.12/61

Technical Data

Input

Nom. voltage U_N (L1/L2/L3):	3 AC 42 ... 60 V, 100 ... 127 V 3 AC 220 ... 240, 380 ... 500 V	
Voltage range:	0.85 ... 1.1 U_N	
Nominal frequency of U_N:	50 / 60 Hz	
Nominal consumption:	Approx. 2 W	

Output

Contacts:		
.11:	1 changeover contact	
.12:	2 changeover contacts	
Operate / release delay:	< 100 / 50 ms	
Thermal current I_{th}:	Max. 5 A (see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1
To DC 13		
NO contact:	1 A / DC 24 V	IEC/EN 60947-5-1
NC contact:	1 A / DC 24 V	IEC/EN 60947-5-1
Electrical life		
at 5 A, AC 230 V cos φ = 1:	10^5 switch. cycles	IEC/EN 60947-5-1
Short circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60947-5-1
Mechanical life:	> 20 x 10^6 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:	IEC 60664-1	
L1, L2, L3 to 11, 12, 14; 21, 22, 24:	6 kV / 2	
11, 12, 14 to 21, 22, 24:	4 kV / 2	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61000-4-2
HF irradiation 80 MHz ... 6 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:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm, frequency 10 ... 55 Hz,	IEC/EN 60068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60068-1
Terminal designation:		EN 50005

Technical Data

Wire connection		DIN 46228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
Max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
Max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
Min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60715
Weight:	Approx. 140 g	

Dimensions

Width x height x depth:	
MK 9056N:	22.5 x 90 x 97 mm
MK 9056N PC:	22.5 x 111 x 97 mm
MK 9056N PS:	22.5 x 104 x 97 mm

CCC-Data

Auxiliary voltage U_N:	3 AC 42-60 V, 3 AC 100-127V, 3 AC 220-240 V	
Variants:	All versions except MK 9056N. _ _ / 61	
Switching capacity		
to AC 15		
NO contact:	1.5 A / AC 230 V	IEC/EN 60947-5-1

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

UL-Data

Switching capacity:	
.11:	250Vac, 2A Pilot duty 0.5hp 250Vac 5A, 250 Vac General Purpose
.12:	B300, R300 Pilot duty 0.5hp 240Vac 5A, 250 Vac General Purpose
Wire connection:	60 °C / 75 °C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

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

Standard Types

MK 9056N.12/61 3 AC 380 ... 500 V 50 / 60 Hz
Article number: 0069733
- Output: 2 changeover contacts
- Nominal voltage U_N: 3 AC 380 ... 500 V
- Width: 22.5 mm

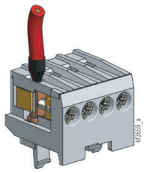
Variant

Ordering Example for Variant

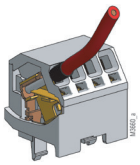
MK 9056N. 12 _ _ /61 3 AC 380 ... 500 V 50 / 60 Hz

- Nominal frequency
- Nominal voltage
- With UL approval
- Type of terminals
  without indication:
  Terminal blocks fixed with screw terminals
  PC (plug in cageclamp):
  Pluggable terminal blocks with cage clamp terminals
  PS (plug in screw):
  Pluggable terminal blocks with screw terminals
- Contacts
  .11 = 1 changeover contact
  .12 = 2 changeover contacts
- Type

Options with Pluggable Terminal Blocks



Screw terminal
(PS/plugin screw)

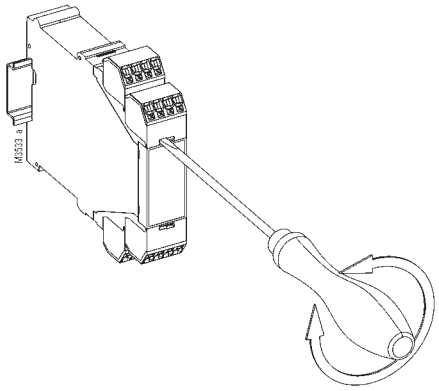


Cage clamp
(PC/plugin cage clamp)

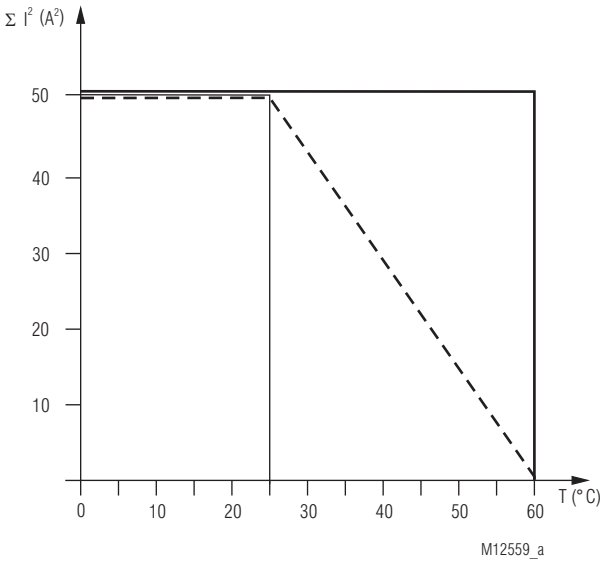
Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



Characteristics



Device mounted on distance with air circulation.
Max. current at 60°C over
2 contact paths = 5A ≙ $2x5^2A^2 = 50A^2$

Device mounted without distance heated by devices with same load.
Max. current at 60°C over
2 contact paths = 0,5A ≙ $2x0,5^2A^2 = 0,5A^2$

$$\Sigma I^2 = I_1^2 + I_2^2$$

I_1, I_2 - Current in contact paths

Quadratic total current limit curve