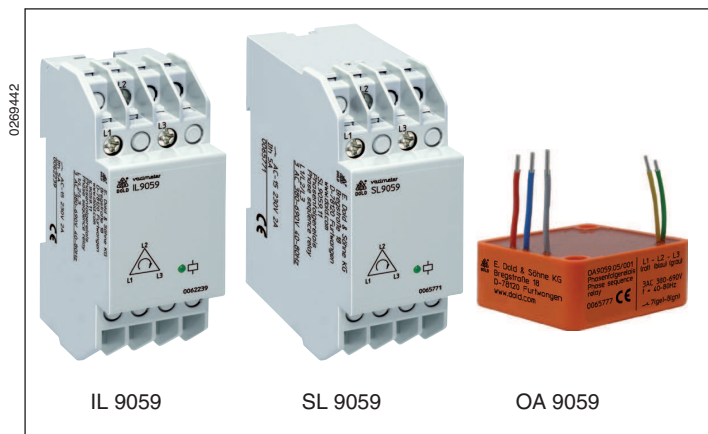


## VARIMETER

Phase Sequence Module  
IL 9059, SL 9059, OA 9059



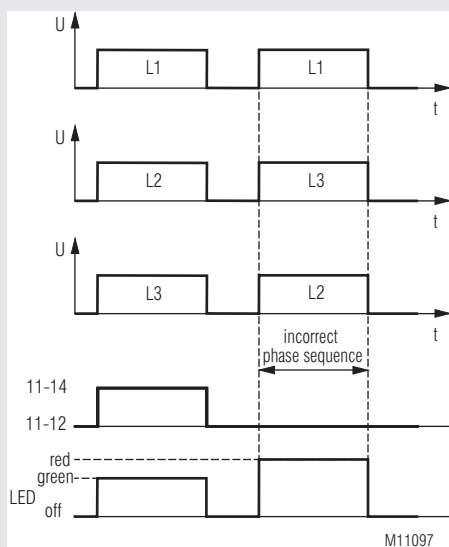
### Your Advantages

- Protects mobile equipment against damage or destruction coming from wrong phase sequence
- OA 9059: reduced wiring by mounting directly in the motor connection box

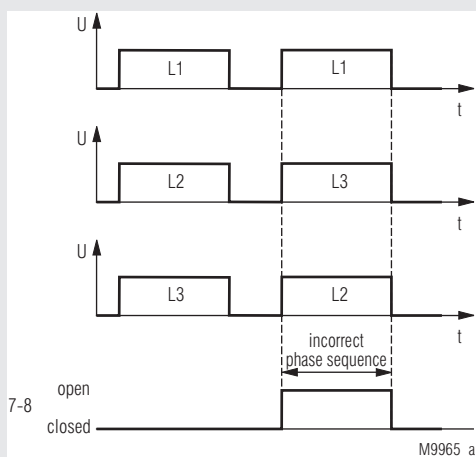
### Features

- According to IEC/EN 60255-1
- Detection of incorrect phase sequence
- No separately auxiliary voltage necessary
- Nominal voltage range 3 AC 380 ... 690 V
- Suitable for operation with inverters (f = 40 ... 80 Hz)
- Relay output:
  - IL/SL 9059: 1 changeover contact
  - OA 9059: 1 NC contact
- Extended temperature range
- Devices available in 3 enclosure versions:
  - IL 9059: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  - SL 9059: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
  - OA 9059: sealed modul with stranded wire connection suitable for mounting in terminal box
- Width
  - IL/SL 9059: 35 mm
  - OA 9059: 62 mm

### Function Diagrams



IL 9059, SL 9059



OA 9059/001

### Approvals and Markings



\*) only IL 9059

### Applications

In many application with pumps, conveyors and fans efficient monitoring systems should help to detect failures and misfunctions in time, to avoid damage and long times of non-operation.

Besides speed and frequency the monitoring of phase sequence is very important.

The phase sequence relay with it's wide voltage range of 3AC380-690V detects a wrong phase sequence and signals via a galvanically separated relay contact the wrong rotation of a motor.

By integrating the relay output into the enabling circuit of a plant, the unit disables the start of the plant in the case of wrong phase sequence. especially portable equipment can be protected in this way.

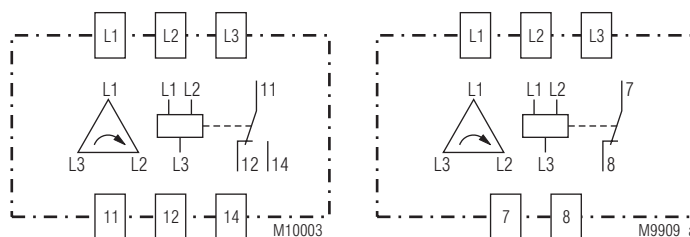
### Indicators

2-colour LED at IL/SL 9059

green: correct phase sequence contacts 11-14 closed

red: incorrect phase sequence contacts 11-12 closed

### Circuit Diagrams



IL 9059, SL 9059

OA 9059

Connection Terminals	
Terminal designation	Signal designation
L1, L2, L3	Input circuit OA 9059: L1 (red), L2 (blue), L3 (grey)
7, 8 (OA 9059)	NO contact: 7 (yellow), 8 (green)
11,12,14 (IL/SL 9059)	Changeover contact

### Technical Data

#### Input circuit

<b>Nominal voltage <math>U_N</math>:</b>	3 AC 380 ... 690 V
<b>Voltage range:</b>	0.85 ... 1.1 $U_N$ (3 AC 320 ... 760 V)
<b>Nominal frequency:</b>	ca. 3 VA
<b>Frequency range:</b>	40 ... 80 Hz (main frequency); suitable for operation with inverters with independant pulse frequency

#### Output

<b>Contact</b>	
IL/SL 9059:	1 changeover contacts
OA 9059:	1 NC contact
<b>Contact material:</b>	AgNi 0.15 gold plated
<b>Switching voltage:</b>	AC 250 V
<b>Response time:</b>	After connection of all 3 phase with incorrect phase sequence until NC contact at OA 9059/001 opens: approx. 100 ms

#### Thermal current $I_{th}$ :

IL/SL 9059:	5 A
OA 9059:	2 A

#### Switching capacity IL/SL 9059

to AC 15:	2 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	2 A / DC 24 V	IEC/EN 60 947-5-1

#### Switching capacity OA 9059

to AC 15:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	IEC/EN 60 947-5-1

#### Electrical life:

1.5 x 10<sup>5</sup> switching cycles

#### Short circuit strength

##### max. fuse rating:

IL/SL 9059:	4 A gL	IEC/EN 60 947-5-1
OA 9059:	2 A gL	IEC/EN 60 947-5-1

#### Mechanical life:

≥ 30 x 10<sup>8</sup> switching cycles

### General Data

**Operating mode:** Continuous operation

#### Temperature range

Operation

IL/SL 9059: - 30 ... + 70°C

OA 9059: - 30 ... + 75°C

Storage

IL/SL 9059: - 40 ... + 70°C

OA 9059: - 45 ... + 75°C

Relative air humidity: 93 % at 40 °C

**Altitude:** < 2,000 m

#### Clearance and creepage

##### distances

rated rated impulse voltage voltage /

pollution degree;

Output to Input: 6 kV / 3 IEC 60 664-1

#### EMC

Statische Entladung (ESD): 8 kV (Luftentladung) IEC/EN 61 000-4-2

HF irradiation

80 MHz ... 1 GHz: 10 V / m IEC/EN 61 000-4-3

IL/SL 9059:

1 GHz ... 2 GHz: 3 V / m IEC/EN 61 000-4-3

2 GHz ... 2.7 GHz: 3 V / m IEC/EN 61 000-4-3

OA 9059:

1 GHz ... 2 GHz: 10 V / m IEC/EN 61 000-4-3

2 GHz ... 2.7 GHz: 10 V / m IEC/EN 61 000-4-3

Fast transients: 2 kV IEC/EN 61 000-4-4

HF-wire guided

IL/SL 9059: 30 V / m IEC/EN 61 000-4-6

OA 9059: 10 V / m IEC/EN 61 000-4-6

Surge voltages: 2 kV IEC/EN 61 000-4-5

Interference suppression: Limit value class B EN 55 011

### Technical Data

#### Degree of protection:

IL/SL 9059: Housing: IP 40 EN 60 529

Terminals: IP 20 EN 60 529

OA 9059: Module is completed sealed-in

#### Housing:

IL/SL 9059: Thermoplastic with V0 behaviour

according to UL subject 94

Potting compound UL approval

OA 9059:

#### Vibration resistance:

Amplitude 0.35 mm, frequency 10 ... 55 Hz, IEC/EN 60 068-2-6

#### Climate resistance:

IL/SL 9059: 30 / 070 / 04 IEC/EN 60 068-1

OA 9059: 30 / 075 / 04 IEC/EN 60 068-1

#### Wire connection:

IL/SL 9059: 2 x 2.5 mm<sup>2</sup> solid DIN 46 228

2 x 1.5 mm<sup>2</sup> stranded ferruled

DIN 46 228-1 /-2 /-3

OA 9059:

L1; L2; L3: 0.5 mm<sup>2</sup>, double insulation

7; 8: 0.25 mm<sup>2</sup>, double insulation

wire length: 25 cm

**Wire fixing IL/SL 9059:** Flat terminals with self-lifting clamping piece EN 60 999

#### Fixing torque:

IL/SL 9059: 0.8 Nm

#### Mounting

IL/SL 9059: DIN rail IEC/EN 60 715

OA 9059

Mounting screws: M4 x 25 mm

Fixing torque: 1.2 Nm

#### Weight:

IL 9059: approx. 215 g

SL 9059: approx. 245 g

OA 9059: approx. 180 g

### Dimensions

#### Width x height x depth:

IL 9059: 35 x 90 x 59 mm

SL 9059: 35 x 90 x 98 mm

OA 9059: 62 x 62 x 25 mm

## Standard Type

IL 9059.11 3 AC 380 ... 690 V 40 ... 80 Hz

for mounting in consumer units or industrial distribution systems

Article number: 0062239

- Output: 1 changeover contact
- Nominal voltage  $U_N$ : 3 AC 380 ... 690 V
- Frequency range: 40 ... 80 Hz
- De-energized on trip
- Width: 35 mm

SL 9059.11 3 AC 380 ... 690 V 40 ... 80 Hz

for cabinets with mounting plate

Article number: 0065771

- Output: 1 changeover contact
- Nominal voltage  $U_N$ : 3 AC 380 ... 690 V
- Frequency range: 40 ... 80 Hz
- De-energized on trip
- Width: 35 mm

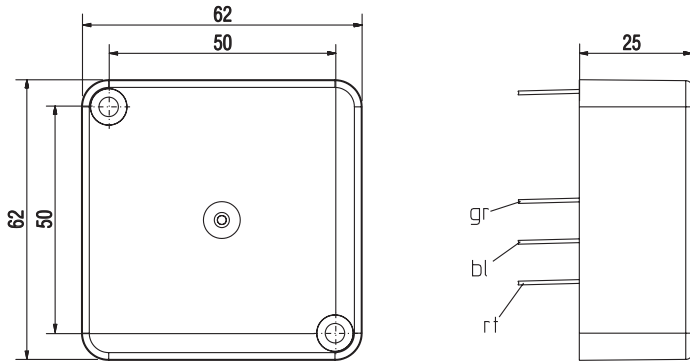
OA 9059.05/001 3 AC 380 ... 690 V 40 ... 80 Hz

for mounting in terminal box

Article number: 0065777

- Output: 1 NC contact
- Nominal voltage  $U_N$ : 3 AC 380 ... 690 V
- Frequency range: 40 ... 80 Hz
- Energized on trip
- Width: 62 mm

## Dimension OA 9059



M10799

