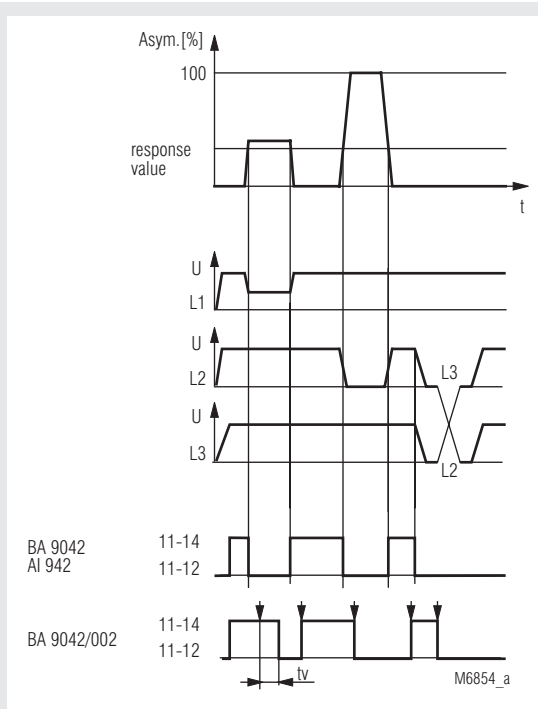


## VARIMETER Asymmetry Relay BA 9042, AI 942



- According to IEC 255, EN 60 255, VDE 0435 part 303
- For nominal voltage from 3 AC 230 V to 500 V
- Detection of
  - voltage asymmetry
  - wrong phase sequence
  - phase failure
- Detection of feedback voltage
- BA 9042 optionally with adjustable time delay
- Closed circuit operation
- BA 9042 LED indicators for operation and state of contacts
- Width 45 mm

### Function Diagram



### Approvals and Marking



### Application

Monitoring three-phase mains for voltage asymmetry, phase failure or incorrect phase sequence.

### Function

The device responds to unsymmetric voltage changes, which can occur because of unbalanced load or phase failure (blown fuse). An asymmetry relay detects only the voltage difference between 2 phases and does not react on symmetric undervoltage.

### Indicators

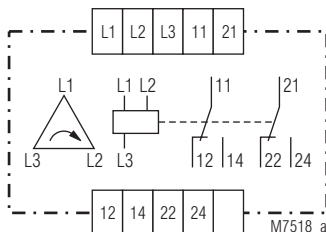
BA 9042  
red LED: on, when supply voltage connected  
green LED: on, when output relay energized

### Notes

On ambient temperature > 20 °C overvoltage together with max. thermal current is not allowed. In industrial voltage systems with high harmonic content (content > 2 %) measuring faults can occur. Harmonics in industrial systems are caused by thyristor controls, emergency power supplies, reactive current compensators, etc.

Normally the harmonic content of a voltage system is unknown. We recommend therefore to test a sample in the actual circuit which we can provide with the right to return. If problems occur during the test we are able to offer other solutions.

### Circuit Diagram



BA 9042 / AI 942

### Technical Data

#### Input

**Nominal voltage  $U_N$ :** 3 AC 230, 240, 400, 415, 440, 500 V  
**Voltage range:** 0.8 ... 1.1  $U_N$   
**Nominal consumption:** ≤ 3.8 VA  
**Nominal frequency:** 50 or 60 Hz  
**Frequency range:** ± 5 %

#### Setting ranges

**Setting range:** 5 ... 15 % voltage asymmetry, settable

#### Hysteresis

BA 9042 : > 0.98

#### 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 %

## Technical Data

### Output

### Contacts

BA 9042:	2 changeover contacts
AI 942.001:	1 changeover contact
AI 942.002:	2 changeover contacts

### Release delay:

(at phase failure or asymmetry)

≤ 150 ms

If the voltage system becomes again symmetric before 150 ms the contacts may switch

### Operate delay:

(delay of the contacts when switching on)

≤ 500 ms

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

6 A

### 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 IEC/EN 60 947-5-1

AI 942.001: ≥ 5 x 10<sup>5</sup> switching cycles

to AC 15 at 1 A, AC 230 V IEC/EN 60 947-5-1

BA 9042.12, AI 942.002: ≥ 2.5 x 10<sup>5</sup> switching cycles

### Short-circuit strength

max. fuse rating: 4 AgL IEC/EN 60 947-5-1

Mechanical life: > 30 x 10<sup>6</sup> switching cycles

## 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

wire for powers supply: 1 kV IEC/EN 61 000-4-5

between wire and ground: 2 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:** Thermoplastic with V0 behaviour according to UL subject 94

**Vibration resistance:** Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz

**Climate resistance:** 20 / 060 / 04 IEC/EN 60 068-1

**Terminal designation:** EN 50 005

**Wire connection:** 2 x 2.5 mm<sup>2</sup> solid or 2 x 1.5 mm<sup>2</sup> stranded wire with sleeve DIN 46 228-1/-2/-3/-4

**Wire fixing:** Flat terminals with self-lifting

clamping piece IEC/EN 60 999-1

Mounting: DIN rail IEC/EN 60 715

### Weight

BA 9042: 310 g

AI 942: 300 g

## Dimensions

### Width x height x depth

BA 9042: 45 x 73 x 132 mm

AI 942: 45 x 77 x 127 mm

## Standard Type

BA 9042 3 AC 400 V 50 Hz

Article no.: 0040770 stock item

• Output: 2 changeover contacts

• Nominal voltage  $U_N$ : 3 AC 400 V

• Width: 45 mm

## Variant

BA 9042/002: with time delay  $t_v = 0.5 \dots 10$  s on asymmetry detection

## Ordering example for variant

BA 9042 /002 3 AC 400 V 50 Hz

Nominal frequency  
Nominal voltage  
Variant, if required  
Type

AI 942 .001 3 AC 400 V 50 Hz

Nominal frequency  
Nominal voltage  
Contacts  
Type

## Accessories

AI 942:

K 70-34: Cover