VARIMETER
Phase Sequence Relay
BA 9041, AI 941 N

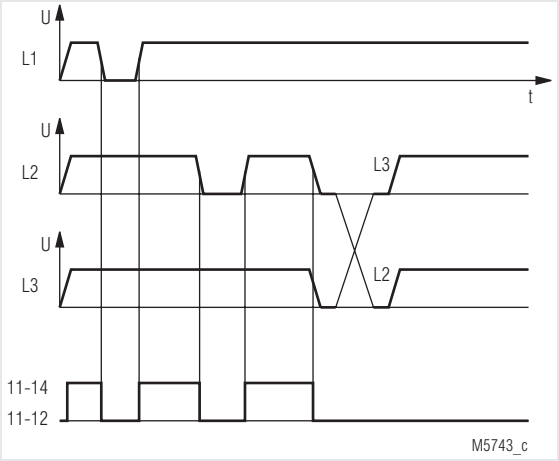
0225150


BA 9041

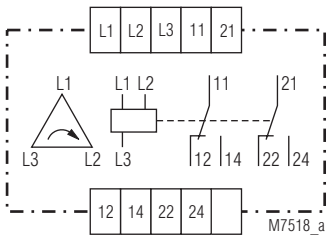

AI 941 N

- According to IEC/EN 60 255-1
- Detection of wrong phase sequence
- 1 or 2 changeover contacts
- Width 45 mm

Function Diagram



Circuit Diagram



BA 9041, AI 941 N.002

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

Approvals and Markings

CE

Applications

Monitoring three-phase mains for incorret phase sequence

Function

The phase sequence relays BA 9041 and AI 941N monitor the right order of the phases in a 3-phase system. When all 3 phases are connected to the device and the phase sequence is correct the output contacts are activated, 11-14 and 21-24 close and a green LED comes on.

When the voltage in one phase drops below 60 % of the nominal voltage the relay is de-energized. If a load feeds back a voltage that is higher then 60 % U_N the fault is not detected. To avoid this problem an asymmetry relay BA 9040 should be used.

In systems with commutation peaks (thyristor controlled drives) the device can falsely detect a phase failure.

In this case it is helpful to know as much as possible about the actual conditions in the system.

Technical Data

Input

Nominal voltage U_N:	3 AC 190, 220, 230, 240, 380, 400, 415, 440, 500 V
Voltage range:	0.8 ... 1.1 U_N
Nominal frequency of U_N:	50 Hz (60 Hz on request)
Frequency range:	± 5 %
Nominal consumption:	< 3.5 VA

Output

Contacts		
AI 941 N.001:	1 changeover contact	
AI 941 N.002, BA 9041:	2 changeover contacts	
Operate-/release delay:	< 100 / < 50 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	2 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		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	2.5 x 10^5 switching cycles	
Short-circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Strorage:	- 20... + 60 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
Overvoltage category:	III up to 3 AC 480 V	
Overvoltage category:	II for 3 AC 500 V	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 2,7 GHz:	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:	1 kV	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
HF-wire guided:	10 V	IEC/EN 61 000-4-6
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, frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Stripping length:	10 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
BA 9041:	310 g	
AI 941 N:	300 g	

Dimensions

Width x height x depth	
BA 9041:	45 x 73,2 x 119,8 mm
AI 941 N:	45 x 77 x 115 mm

Standard Type

BA 9041 AC 400 V 50 Hz

Article number:	0041732
• Output:	2 changeover contacts
• Nominal voltage U_N:	AC 400 V
• Width:	45 mm

Variant

AI 941 N. _ _ _ /03:	Nominal frequency 50 ... 60 Hz, phase failure cannot be detected with this unit

Ordering example for variants