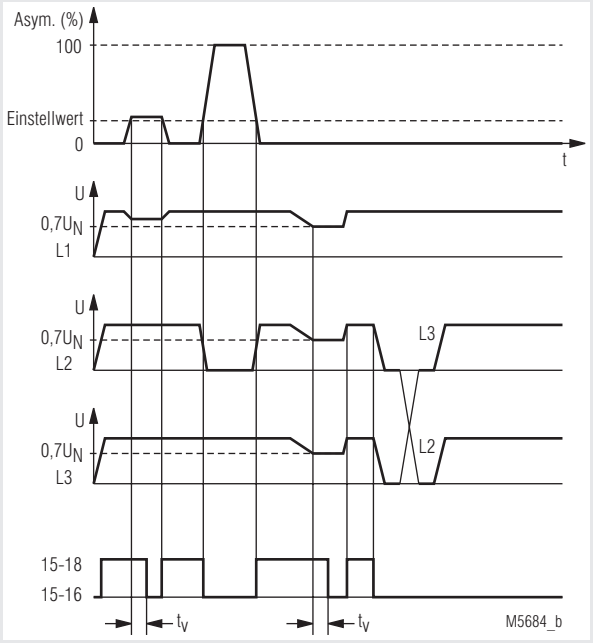
VARIMETER
Asymmetry Relay
AK 9840

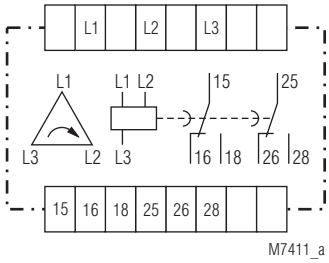
0260659

- According to IEC/EN 60255-1
- For nominal voltages from 3 AC 110 up to 690 V
- Detection of
  - Voltage asymmetry
  - Incorrect phase sequence
  - Phase failure
  - Undervoltage
- Voltage feedback recognition
- Also suitable for harmonic industrial mains
- Closed circuit operation
- Contact position indication
- With adjustable delay
- 2 C/O contacts
- Width: 75 mm

Function Diagram



Circuit Diagram



AK 9840.82

Approvals and Markings

CE

Application

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

Function

The AK 9840 asymmetry relay monitors the voltage symmetry of the phase voltages, the undervoltage and the correct phase sequence L1-L2-L3. Voltage asymmetry and undervoltage are determined by measuring the arithmetic average between the three phases.
If there is no fault in the system being monitored the output relay is energized (closed circuit principle), contact 15-18, 25-28 is closed, and this is indicated by a green LED. The instrument responds to asymmetrical voltage changes caused by unequal mains loading or failure of an outer conductor due to the melting of a fuse. An asymmetry relay always only detects the difference between two voltages, and hence does not react to symmetric voltage falls in the mains supply unless the voltage drops belowthe undervoltage recognition vaiue set at 0.7 U_N. If the set asymmetry is exceeded positively or negatively or if there is undervoltage, the output relay is deenergized alter the set response delay. If the phase sequence is incorrect, the output relay responds without delay. The LED indicator is extinguished. Thanks to the special circuitry which evaluates the phase angle, an a fault condition, the relay will not be affected by any voltage feedback. Depending an the mains conditions, the feedback is identified as asymmetry - delayed - or as incorrect phase sequence - non-delayed.
Mains supplies with a mid-point conductor can also be monitored with the Instrument. It is not necessary to connect the neutral. The nominal voltage for this application must be converted to delta voltage when placing an order. Industrial mains with thyristors, with automatic reactive current compensating plant and with emergency power generators have a high harmonic content. With the AK 9840 the measuring principle employed ensures that no errors occur in the response values. Also suitable for automatic changeoverto battery-powered operation of emergency lightings when the supply voltage drops by 30 % (to VDE 0108).

Connection Terminals

Klemmenbezeichnung	Signalbeschreibung
L1, L2, L3	Connection of the monitoring 3-phase system
15, 16, 18	1. changeover contact
25, 26, 28	2. changeover contact

Indication

LED: on, when output relay active

All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.

Technical Data

Input

Nominal voltage U_N:	3 AC 400 V additional voltages for ranges 3 AC 110 ... 690 V are also available on request
Voltage range:	0.7 ... 1.1 U_N / 0.7 ... 1.2 U_N to 1.5 s
Nominal consumption:	≤ 7.1 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 % / 10 % to 1.5 s
Max. harmonics level:	distortion factor K ≤ 12 %

Setting Ranges

Setting range:	5 ... 20 % U_N voltage asymmetry settable
Hysteresis:	0.98 fixed
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 %
Undervoltage setting:	0.7 U_N
Delay:	0.5 ... 5 s infinite variable

Output

Contacts		
AK 9840.82:	2 changeover contacts	
Thermal current I_{th}:	6 A	
Switching capacity		
to AC 15		
NO contact:	2 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1
to DC 13:	1 A / DC 24 V	IEC/EN 60947-5-1
Electrical life		
bei 6 A, AC 230 V cos φ = 1:	1,5 x 10^5 Schaltspiele	
Short-circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20... + 60 °C	
Storage:	- 25... + 60 °C	
Altitude:	< 2000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Measuring input to contacts:	6 kV / 2	IEC 60664-1
Relay contact to relay contact:	4 kV / 2	IEC 60664-1
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		
wire for powers supply:	1 kV	IEC/EN 61000-4-5
between wire and ground:	2 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 acccording 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	
Wire connection:	DIN 46 228-1/-2/-3/-4	

Technical Data

Screw terminals:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve	
Insulation of wires or sleeve length:	8 mm	
Wire fixing:	Plus-minus terminal screws M3.5 with self-lifting clamping piece	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60715
Weight:	300 g	

Dimensions

Width x height x depth: 75 x 77 x 119 mm

Standard Type

AK 9840.82 3 AC 400 V 50 / 60 Hz

Article number:	0040621
• Output:	2 changeover contacts
• Nominal voltage U_N:	3 AC 400 V
• Width:	75 mm

Characteristic

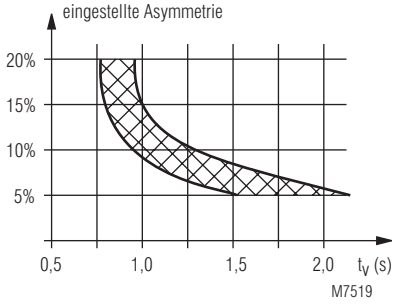


Diagramm Start up delay

The diagram shows the start delay in relation of the adjustet asymmetry when the unit is switched to the symmetric mains.