

VARIMETER Undervoltage Relay BA 9043

Translation
of the original instructions



0221539

Your Advantages

- Preventive maintenance
- For better productivity
- Quicker fault locating

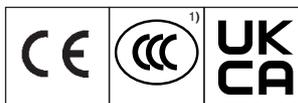
Features

- According to EC/EN 60255-1
- 3-phase
- For nominal voltage of 3 AC 100 / 57 to 690 / 400 V
- Measures arithmetic mean value
- Adjustable operate and release value
- For 3p3w or 3p4w systems
- De-energized on trip operation
- LED indicator for operation and state of contact
- Insensitive to harmonics
- Frequency up to 400 Hz
- Optionally with adjustable time delay
- Width 45 mm

Product Description

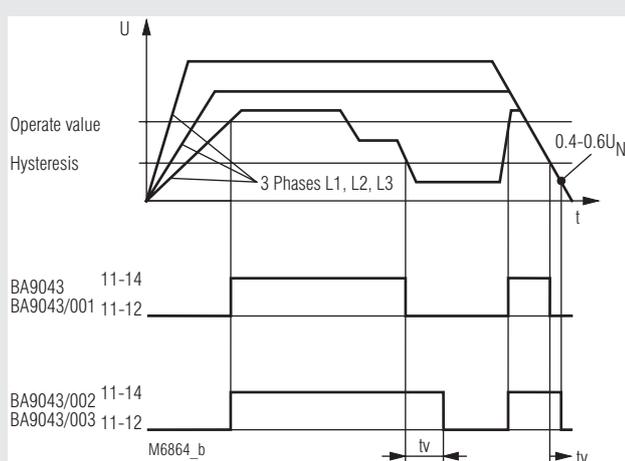
The undervoltage relay BA 9043 of the VARIMETER series monitor 3-phase AC networks. The measurement is very simple and without extensive wiring as there is no auxiliary power supply necessary. The adjustment of the setting values is user friendly and done on 2 rotary switches on the front of the device.

Approvals and Markings



¹⁾ See variants

Function Diagram



Application

- Undervoltage detection in 3 phase systems
- For industrial and railway applications

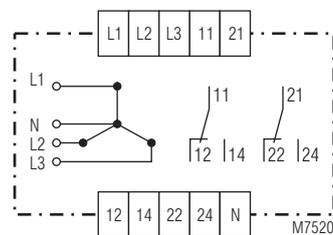
Indicators

- Red LED: On, when voltage connected
- Green LED: On, when output contact activated

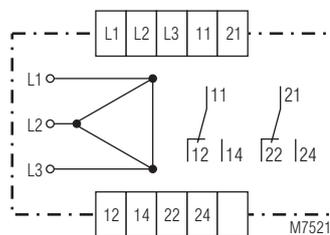
Notes

For determination of the arithmetic mean value of the voltage the 3 phases are measured against N. The variants without N (/001 and /003) measure L1 and L2 against L3. At devices with delay the delay is only active at $U \geq 0,6 U_N$. At $< 0,4 U_N$ the relay switches off without delay.

Circuit Diagrams



BA 9043, BA 9043/002



BA 9043/001, BA 9043/003

Connection Terminals

Klemmenbezeichnung	Signalbeschreibung
L1, L2, L3, N	Connection of the monitoring 3-phase system
11, 12, 14	1. changeover contact
21, 22, 24	2. changeover contact

Technical Data

Input

Nominal voltage U_N BA 9043, BA 9043/002:	3/N AC 100/57 V; 220/127 V; 400/230 V 415/240 V; 440/254 V; 500/290 V; 3/N AC 690/400 V
BA 9043/001, BA 9043/003:	3 AC 100 V; 220 V; 400 V; 415 V, 440 V; 500 V; 3 AC 690 V
Max. overload:	1.2 U_N continuously
Nominal consumption:	AC 4 VA
Nominal frequency:	50 ... 400 Hz
Frequency range:	$\pm 5\%$
Temperature influence:	$< 0.05\% / K$

Setting Ranges

Response value:	0.85 ... 1.05 U_N , infinite variable with upper potentiometer
Hysteresis:	0.75 ... 0.95 of operate value
Setting accuracy:	$\leq \pm 10\%$
Switching delay t_M:	See diagram switching delay
Time delay t_r:	Infinite variable from 0.5 ... 10 sec for BA 9043/002, BA 9043/003 Between 0.4 and 0.6 U_N the contacts fall back according to the diagram without additional delay

Output

Contacts:	2 changeover contacts
Thermal current I_{th}:	Continuous current limit curve (max. 6 A per contact)
Switching capacity to AC 15	
NO contact:	2 A / AC 230 V IEC/EN 60947-5-1
NO contact at 0.1 Hz:	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:	1 A / DC 24 V IEC/EN 60947-5-1
Electrical life at 3 A, AC 230 V $\cos \varphi = 1$:	2 x 10^5 switching cycles IEC/EN 60947-5-1
Short circuit strength max. fuse rating:	4 A gG / gL IEC/EN 60947-5-1
Mechanical life:	$> 30 \times 10^6$ 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:	6 kV / 2 IEC 60664-1
Overvoltage category:	III
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61000-4-2
HF irradiation 80 MHz ... 2.7 GHz:	20 V/m IEC/EN 61000-4-3
Surge voltages between wires for power 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 according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm IEC/EN 60068-2-6 frequency 10 ... 55 Hz
Climate resistance:	20 / 060 / 04 IEC/EN 60068-1
Terminal designation:	DIN EN 50005

Technical Data

Wire connection:	DIN 46228-1/-2/-3/-4 2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded wire with sleeve
Wire fixing:	Plus-minus terminal screws M3.5 with self-lifting clamp. piece IEC/EN 60 999-1
Stripping length:	10 mm
Fixing torque:	0.8 Nm
Mounting:	DIN rail IEC/EN 60715
Weight:	310 g

Dimensions

Width x height x depth:	45 x 73 x 132 mm
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CCC-Data

Thermal current I_{th}:	5 A
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Technical data that is not stated in the CCC-Data, can be found in the technical data section.

Classification to DIN EN 50155

Vibration and shock resistance:	Category 1, Class B IEC/EN 61373
Service temperature classes:	OT1, compliant OT2, OT3 and OT4 with operational limitations
Protective coating of the PCB:	No

Standard Type

BA 9043 3/N AC 400 / 230 V	50 ... 400 Hz
Article number:	0039676
• For 3p4w systems	
• Nominal voltage U_N :	3/N AC 400 / 230 V
• Output:	2 changeover contacts
• Width:	45 mm

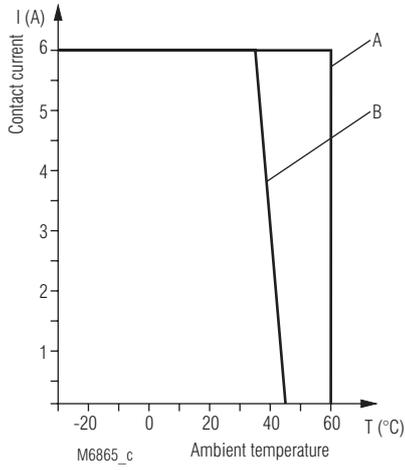
Variants

BA 9043/001:	Without neutral
BA 9043/002:	With neutral, adjustable time delay $t_v = 0.5 \dots 10$ sec
BA 9043/003:	Without neutral, adjustable time delay $t_v = 0.5 \dots 10$ sec
BA 9043:	With CCC-approval on request

Ordering example for variants

BA 9043	/	---	3/N AC 400/230 V	50 ... 400 Hz	
					Nominal frequency
					Nominal voltage
					Variant, if required
					Type

Characteristics



- A = Device free-standing
- B = Device mounted without distance heated by devices with same load.

Continuous current limit curve

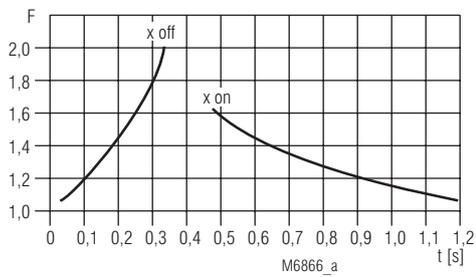


Diagram switching delay

Switching delay t_M :

When the voltage changes fast on the measuring input, the arithmetic mean value can only adjust after a short delay.

Example:

$$F = \frac{U_{\text{applied}}}{U_{\text{setting}}} \quad F = \frac{240 \text{ V}}{190 \text{ V}} = 1.26$$

U setting = 190 V

U applied = 240 V

According to diagram:

$t_{M,\text{on}}$ = Approx. 800 ms

$t_{M,\text{off}}$ = Approx. 100 ms

