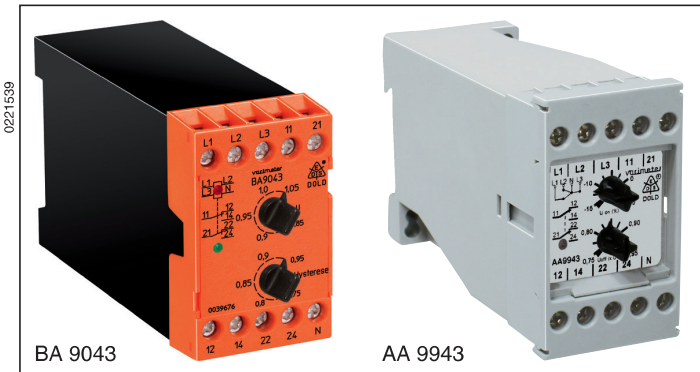
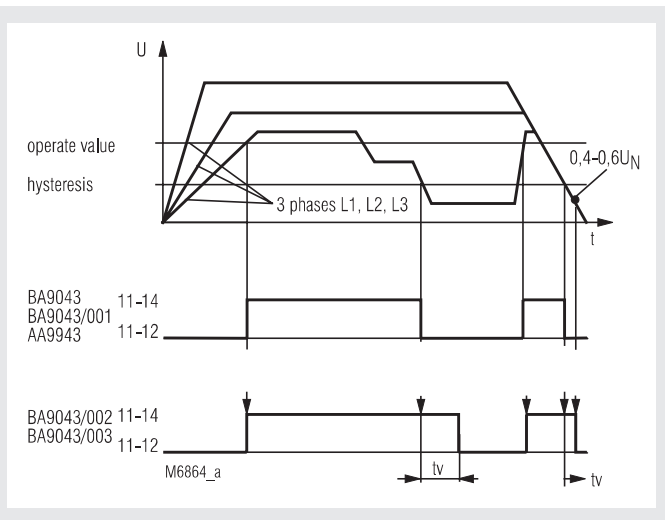


VARIMETER Undervoltage Relay BA 9043, AA 9943



- According to EC/EN 60255-1, IEC/EN 60255-26, VDE 0435 part 303
- 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
- BA 9043 optionally with adjustable time delay
- Closed circuit operation
- LED indicator for operation and state of contact
- Insensitive to harmonics
- Frequency up to 400 Hz
- Width 45 mm

Function Diagram



Approvals and Marking



*) see variants

Application

Undervoltage detection in 3 phase systems

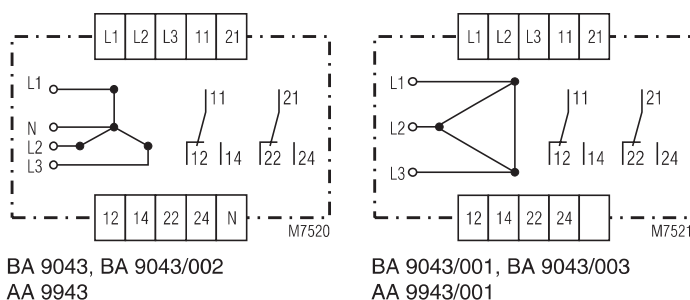
Indicators

upper LED: on, when voltage connected
(only BA 9043)
lower 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.
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 Diagram



Technical Data

Input

Nominal voltage U_N

BA 9043, BA 9043/002
AA 9943: 3/N AC 100/57 V; 220/127 V; 400/230 V
415/240 V; 440/254 V; 500/290 V

BA 9043, BA9043/002:
BA 9043/001, BA 9043/003,
AA 9943/001: 3/N AC 690/400 V

BA 9043, BA9043/002:
BA 9043/001, BA 9043/003,
AA 9943/001: 3 AC 100 V; 220 V; 400 V; 415 V, 440 V;
500 V

BA 9043/001, BA 9043/003: 3 AC 690 V

Max. overload

BA 9043: 1.2 U_N continuously
AA 9943: 1.1 U_N continuously

Nominal consumption: AC 4 VA

Nominal frequency: 50 ... 400 Hz

Frequency range: ± 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: ≤ ± 10 %

Switching delay t_M: see diagram switching delay

Time delay t_v: 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

Technical Data

Output

Contacts

BA 9043:	2 changeover contacts
AA 9943.11:	1 changeover contact
AA 9943.12:	2 changeover contacts
Thermal current I_{th}:	6 A; see diagramm
	Continuous current limit curve

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
to DC 13		
NO contact:	1 A / DC 24 V	IEC/EN 60 947-5-1
NC contact:	1 A / DC 24 V	IEC/EN 60 947-5-1

Electrical life

to AC 15 at 3 A, AC 230 V:	3 x 10 ⁵ switching cycles
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Short circuit strength

max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
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Mechanical life:	> 30 x 10 ⁶ switching cycles
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General Data

Operating mode:	Continuous operation
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Temperature range:	- 20 ... + 60°C
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Clearance and creepage distances

rated impuls voltage / pollution degree:	4 kV / 2	IEC 60 664-1
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EMC

Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
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HF irradiation:	10 V/m	IEC/EN 61 000-4-3
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Fast transients:	2 kV	IEC/EN 61 000-4-4
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Surge voltages between

wires for power supply:	1 kV	IEC/EN 61 000-4-5
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between wire and ground:	2 kV	IEC/EN 61 000-4-5
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HF wire guided:	10 V	IEC/EN 61 000-4-6
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Interference suppression:	Limit value class B	EN 55 011
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Degree of protection

Housing:	IP 40	IEC/EN 60 529
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Terminals:	IP 20	IEC/EN 60 529
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Housing:

Vibration resistance:	Thermoplastic with V0 behaviour according to UL subject 94
	Amplitude 0.35 mm IEC/EN 60 068-2-6
	frequency 10 ... 55 Hz

Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
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Terminal designation:	DIN EN 50 005
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Wire connection:	2 x 2.5 mm ² solid or
	2 x 1.5 mm ² 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
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Weight

BA 9043:	310 g
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AA 9943:	300 g
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Dimensions

Width x height x depth

BA 9043:	45 x 73 x 132 mm
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AA 9943:	45 x 77 x 127 mm
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Standard Type

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

Variants

AA 9943/001:	without neutral
AA 9943/175:	for nuclear power plants
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

AA 9943	.11	/	3/N AC 400/230 V	50 ... 400 Hz	
					Nominal frequency
					Nominal voltage
					Variant, if required
					Contact
					Type

Accessories

AA 9943:		Cover
K 70-34		Article number: 0011790

CCC-Data

Thermal current I_{th}:	5 A
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Switching capacity

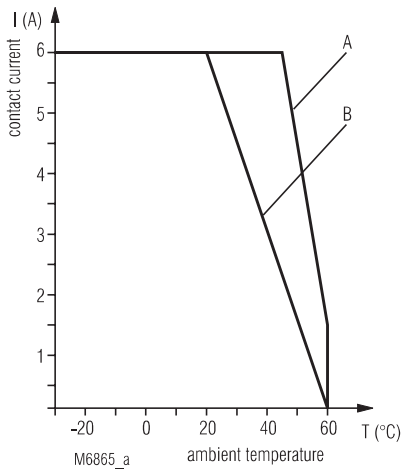
to AC 15:	2 A / AC 230 V	IEC/EN 60 947-5-1
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to DC 13:	1 A / DC 24 V	IEC/EN 60 947-5-1
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Technical data that is not stated in the CCC-Data, can be found in the technical data section.

Characteristics



Continuous current limit curve

A = Devices mounted with 2 cm distance

B = Devices mounted without distance

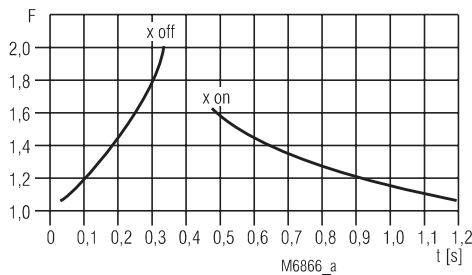


Diagram switching delay

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

Specification for Tender for BA 9043

Undervoltage relay according to IEC 255, VDE 0435 for nominal voltage of 3 AC 100/57 to 500/290 V. Adjustable operate and release value, for 3p4w systems

Width 45 mm

Type BA 9043

Manufactured by E. DOLD & SÖHNE KG

Undervoltage relay according to IEC 255, VDE 0435 for nominal voltage of 3 AC 100/57 to 500/290 V. Adjustable operate and release value, for 3p4w systems, adjustable time delay up to 10 s.

Width 45 mm

Type BA 9043/002

Manufactured by E. DOLD & SÖHNE KG

Undervoltage relay according to IEC 255, VDE 0435 for nominal voltage of 3 AC 100/57 to 500/290 V. Adjustable operate and release value, for 3p3w systems

Width 45 mm

Type BA 9043/001

Manufactured by E. DOLD & SÖHNE KG

Undervoltage relay according to IEC 255, VDE 0435 for nominal voltage of 3 AC 100/57 to 500/290 V. Adjustable operate and release value, for 3p3w systems, adjustable time delay up to 10 s.

Width 45 mm

Type BA 9043/003

Manufactured by E. DOLD & SÖHNE KG

