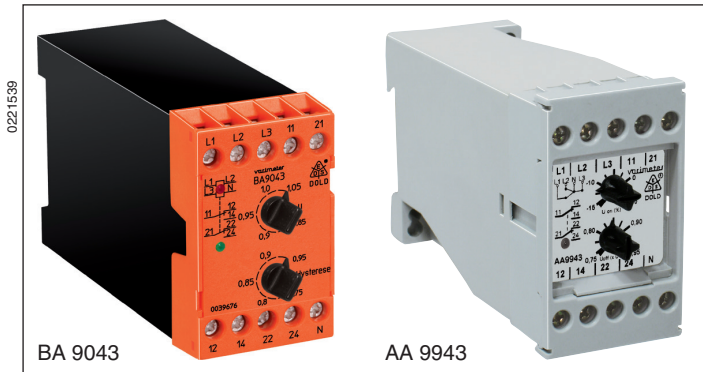
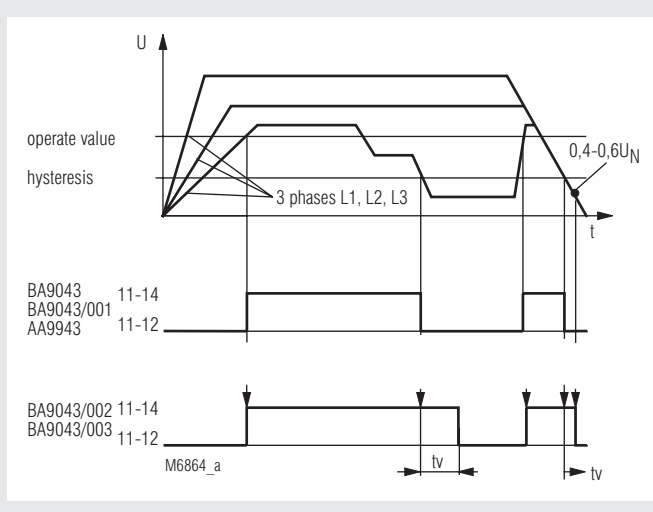


VARIMETER Undervoltage Relay BA 9043, AA 9943



- 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 Markings



*) see variants

Application

Undervoltage detection in 3 phase systems

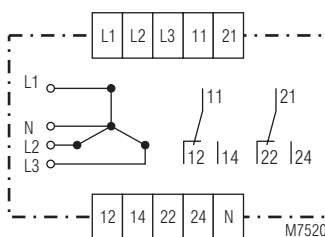
Indicators

upper LED: (only BA 9043)	on, when voltage connected
lower LED:	on, when output contact activated

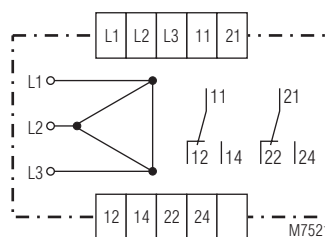
Notes

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



BA 9043, BA 9043/002
AA 9943



BA 9043/001, BA 9043/003
AA 9943/001

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

General Data

Operating mode:	Continuous operation
Temperature range:	- 20 ... + 60°C
Clearance and creepage distances	
rated impulse voltage / pollution degree:	4 kV / 2 IEC 60 664-1
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	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 IEC/EN 60 068-2-6 frequency 10 ... 55 Hz
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1
Terminal designation:	DIN EN 50 005
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
Fixing torque:	0.8 Nm
Mounting:	DIN rail IEC/EN 60 715
Weight	
BA 9043:	310 g
AA 9943:	300 g

Dimensions

Width x height x depth

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

CCC-Data

Thermal current I_{th}:	5 A
Switching capacity	
to AC 15:	2 A / AC 230 V IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V IEC/EN 60 947-5-1



Technical data that is not stated in the CCC-Data, can be found in the technical data section.

Classification to DIN EN 50155 for BA 9043

Vibration and shock resistance:	Category 1, Class B IEC/EN 61 373
Protective coating of the PCB:	No

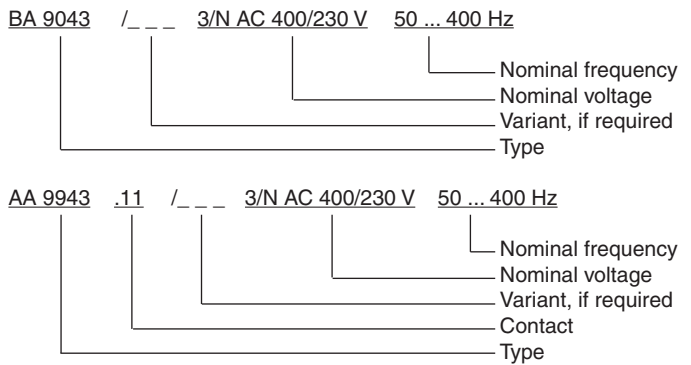
Standard Type

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

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 $t_v = 0.5 ... 10$ sec
BA 9043/003:	without neutral, adjustable time delay $t_v = 0.5 ... 10$ sec
BA 9043:	with CCC-approval on request

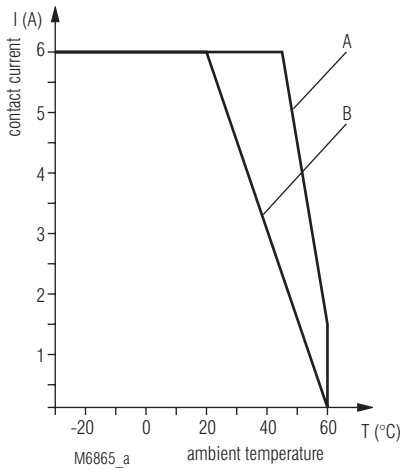
Ordering example for variants



Accessories

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

Characteristics



Continuous current limit curve

A = Devices mounted with 2 cm distance
B = Devices mounted without distance

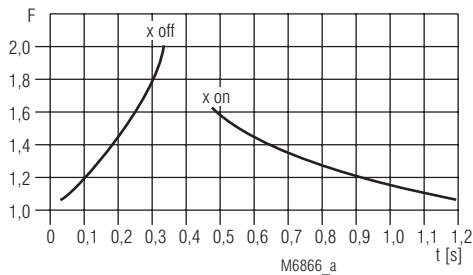


Diagram switching delay

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

