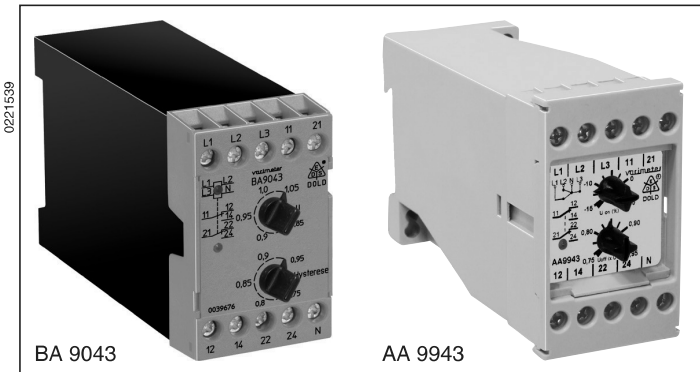
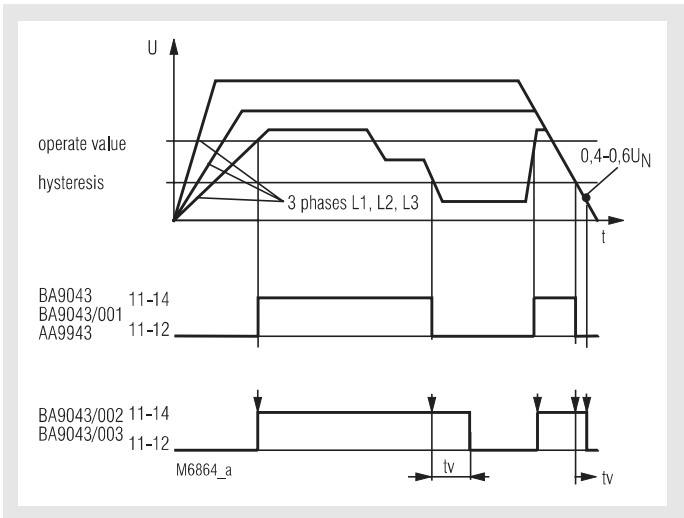


VARIMETER Undervoltage Relay BA 9043, AA 9943

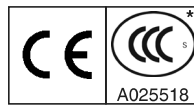


- According to EC/EN 60255-1, IEC/EN 60255-26, VDE 0435 part 303
- 3-phase
- For nominal voltage of 3 AC 100 / 57 to 690 / 400 V
- Measures arithmetic mean value
- Adjustable operate and release value
- For 3p3w or 3p4w systems
- BA 9043 optionally with adjustable time delay
- Closed circuit operation
- 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

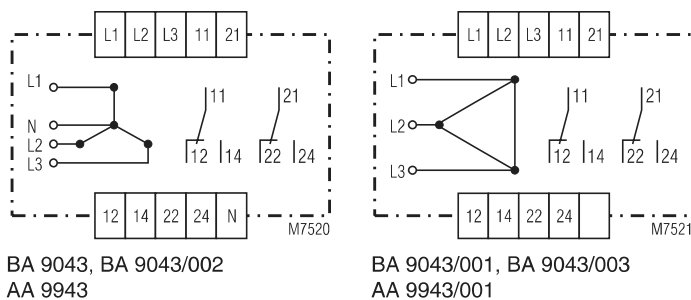
Indicators

| | |
|------------------------------|-----------------------------------|
| upper LED: (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



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 9043/001, BA 9043/003: | 3 AC 100 V; 220 V; 400 V; 415 V, 440 V; 500 V |
| Max. overload BA 9043: AA 9943: | 1.2 U _N continuously 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 10⁵ switching cycles

Short circuit strength

max. fuse rating: 4 A gL IEC/EN 60 947-5-1

Mechanical life: > 30 x 10⁶ switching cycles

General Data

Operating mode: Continuous operation

Temperature range: - 20 ... + 60°C

Clearance and creepage distances

rated impuls 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 mm² solid or 2 x 1.5 mm² 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

DIN rail IEC/EN 60 715

Mounting:

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.

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 $t_v = 0.5 \dots 10 \text{ sec}$ |
| BA 9043/003: | without neutral, adjustable time delay $t_v = 0.5 \dots 10 \text{ sec}$ |
| BA 9043: | with CCC-approval on request |

Ordering example for variants

BA 9043 / _ _ _ 3/N AC 400/230 V 50 ... 400 Hz

Legend:
 — Nominal frequency
 — Nominal voltage
 — Variant, if required
 — Type

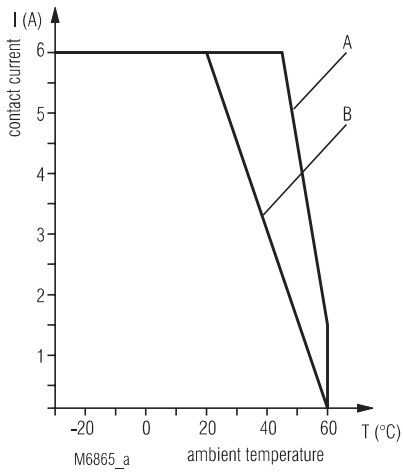
AA 9943 .11 / _ _ _ 3/N AC 400/230 V 50 ... 400 Hz

Legend:
 — Nominal frequency
 — Nominal voltage
 — Variant, if required
 — Contact
 — Type

Accessories

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

Characteristics



Continuous current limit curve

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

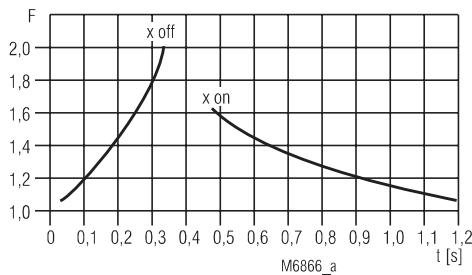


Diagram switching delay

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

