

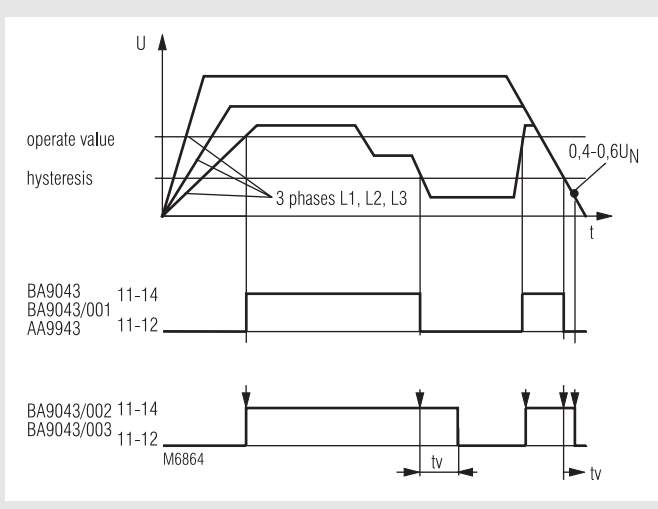
## Undervoltage relay BA 9043, AA 9943 varimeter

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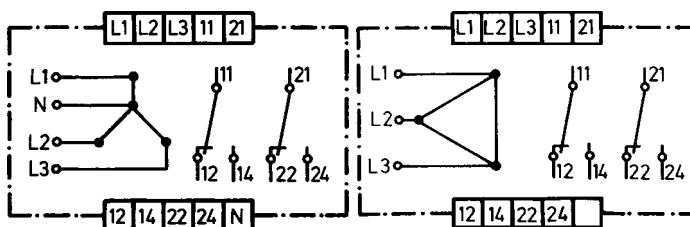


- According to IEC 255, VDE 0435 part 303
- 3-phase
- For nominal voltage of 3 AC 100/57 to 500/290 V
- Measures arithmetic mean value
- Adjustable operate and release value
- For 3p3w or 3p4w systems
- BA 9043 optionally with adjustable time delay
- Closed circuit operation
- LED indicator for operation and state of contact
- Insensitive to harmonics
- Frequency up to 400 Hz
- Width 45 mm

### Function diagram



### Circuit diagram



BA 9043, BA 9043/002  
AA 9943

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

### Approvals and marking



### 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

In units with time delay the delay is only active at  $> 0,4 U_N$ . At  $< 0,4 U_N$  the relay switches without delay.

### Technical data

#### Input

#### Nominal voltage $U_N$

BA 9043, BA 9043/002  
AA 9943:

3/N AC 100/57 V; 230/127 V; 400/230 V  
415/240 V; 440/254 V; 500/290 V  
50/60 Hz  
(can be used up to 400 Hz)

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

3 AC 100 V; 230 V; 400 V; 415 V, 440 V;  
500 V; 50/60 Hz  
(can be used up to 400 Hz)

#### Max. overload

BA 9043:  $1,2 U_N$  continuously  
AA 9943:  $1,1 U_N$  continuously

#### Nominal consumption:

AC 4 VA

#### Nominal frequency:

50 / 60 Hz

#### Frequency range:

$\pm 5 \%$

#### Temperature influence:

$< 0,05 \%$  / K

### Setting ranges

**Response value:**  $0,85 \dots 1,05 U_N$ , infinite variable with upper potentiometer

**Hysteresis:**  $0,75 \dots 0,95$  of operate value

**Setting accuracy:**  $\leq \pm 10 \%$

#### Switching delay $t_m$ :

see diagram switching delay infinite variable from 0,5 ... 10 sec for BA 9043/002, BA 9043/003

#### Time delay $t_v$ :

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
<b>Thermal current <math>I_{th}</math>:</b>	6 A; see diagramm
	Continuous current limit curve

### Switching capacity

to AC 15		
NO contact:	3 A / AC 230 V	EN 60 947-5-1
NC contact:	1 A / AC 230 V	EN 60 947-5-1

### Electrical life

to AC 15 at 3 A, AC 230 V: 3 x 10<sup>5</sup> switching cycles

### Short circuit strength

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

Mechanical life: > 30 x 10<sup>6</sup> switching cycles

## General data

<b>Operating mode:</b>	Continuous operation	
<b>Temperature range:</b>	- 20 ... + 60°C	
<b>Clearance and creepage distances</b>		
overvoltage category / contamination level:	4 kV / 2	DIN VDE 0110-1 (04.97)
<b>EMC</b>		
Electrostatic discharge:	8 kV (air)	EN 61 000-4-2
HF irradiation:	10 V/m	EN 61 000-4-3
Fast transients:	2 kV	EN 61 000-4-4
Surge voltages between		
wires for power supply:	1 kV	EN 61 000-4-5
between wire and ground:	2 kV	EN 61 000-4-5
HF wire guided:	10 V	EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
<b>Degree of protection:</b>	Housing: IP 40	EN 60 529
	Terminals: IP 20	EN 60 529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94	
<b>Vibration resistance:</b>	Amplitude 0,35 mm frequency 10 ... 55 Hz EN 60 068-2-6 20 / 060 / 04 EN 60 068-1	
<b>Climate resistance:</b>	20 / 060 / 04 EN 60 068-1	
<b>Terminal designation:</b>	DIN EN 50 005	
<b>Wire connection:</b>	2 x 2,5 mm <sup>2</sup> solid or 2 x 1,5 mm <sup>2</sup> stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
<b>Wire fixing:</b>	Flat terminals with self-lifting clamping piece EN 60 999	
<b>Mounting:</b>	DIN rail EN 50 022	
<b>Weight</b>		
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

## Standard type

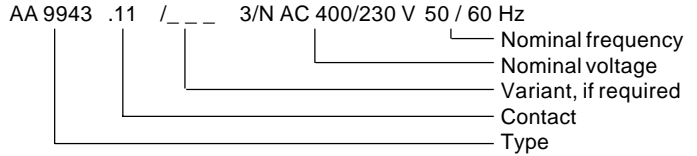
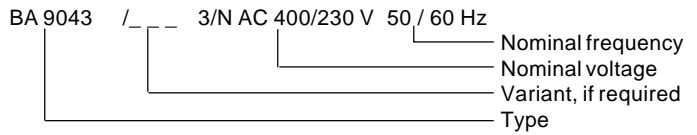
BA 9043	3/N AC 400 / 230 V	50 / 60 Hz	
Article number:	0039676		stock item
• for 3p4w systems			
• Nominal voltage $U_N$ :	3/N AC 400 / 230 V		
• Output:	2 changeover contacts		
• Width:	45 mm		

## Variants

AA 9943/001:	without neutral
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

## Variants

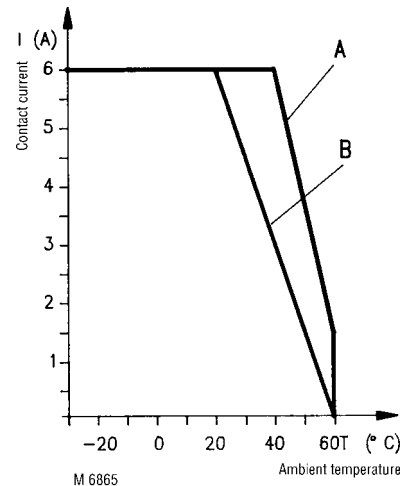
### Ordering example for Variants



## Accessories

AA 9943:	
K 70-34	Cover

## Characteristics



Continuous current limit curve

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

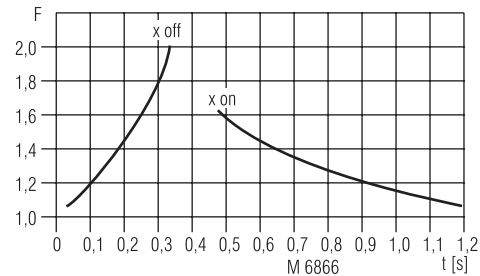


Diagram switching delay

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:

$$F = \frac{U_{\text{applied}}}{U_{\text{setting}}} \quad F = \frac{240 \text{ V}}{190 \text{ V}} = 1,26$$

$U_{\text{applied}} = 190 \text{ V}$   
 $U_{\text{setting}} = 240 \text{ V}$

according to diagram:  
 $t_{M\text{on}} = \text{approx. } 800 \text{ ms}$   
 $t_{M\text{off}} = \text{approx. } 100 \text{ ms}$

### 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

