

# Monitoring Technique

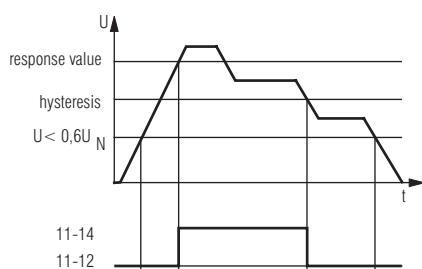
## VARIMETER Voltage Relay BA 9036

**DOLD** 

0225114



### Function Diagram



BA 9036

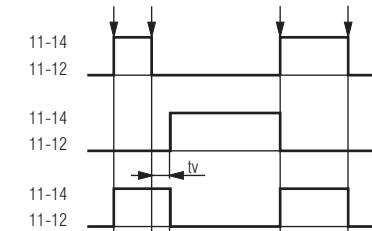
BA 9036/001

BA 9036/010

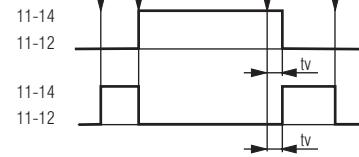
BA 9036/011

BA 9036/012

BA 9036/013



used as undervoltage relay



M6861\_b

- According to IEC 255, EN 60 255, VDE 0435 part 303
- Single-phase
- Measuring ranges from 24 to 400
- Settable response and release value
- Without auxiliary supply
- optionally available with adjustable time delay
- with LED indicators for operation and state of contacts
- 2 changeover contacts
- Width 45 mm

### Approvals and Marking



\* see variants

### Application

Monitoring of voltage in DC and AC systems

### Indicators

upper LED: on, when voltage connected  
lower LED: on, when output contact activated

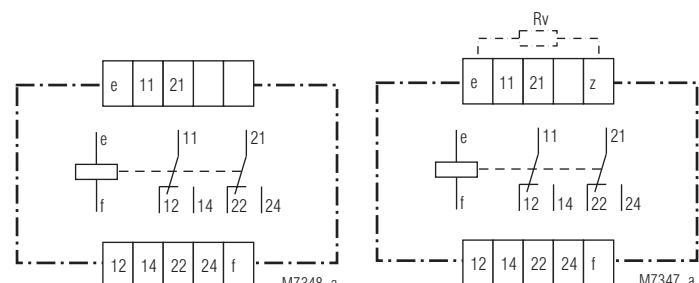
### Notes

#### Mounting instruction for units with external series resistor

The external resistor conducts mains voltage and heats up during operation. It has to be mounted at a suitable location in the cabinet so that touch protection is provided. Because of the heat dissipation a suitable distance to neighbour devices has to be kept.

When using a drop resistor the measuring has to be connected to e and f.

### Circuit Diagrams



BA 9036

connection diagram for AC voltage

BA 9036

connection diagram for DC voltage

### Connection Terminals

| Terminal designation   | Signal designation   |
|------------------------|----------------------|
| e, f                   | Nominal voltage      |
| e, z                   | Series resistor (DC) |
| 11, 12, 14, 21, 22, 24 | changeover contact   |

## Technical Data

### Input

|  |   |
|--|---|
| <b>Nominal voltage <math>U_N</math>:</b> | AC 42, 110, 127, 230, 240, 290, 400 V<br>DC 24, 48, 60 V<br>DC 110*, 127*, 220*, 240 V*<br>*) with external drop resistor<br>DC 110 V*: ZWS 20 SL1.5 kΩ20 W<br>DC 127 V*: ZWS 20 SL1.6 kΩ20 W<br>DC 220 V*: ZWS 35 SL 3.9 kΩ 35 W<br>DC 240 V*: ZWS 35 SL4.7 kΩ35 W |
| <b>Nominal consumption:</b>              | 6 VA / 10 W   |
| <b>Nominal frequency:</b>                | 50 / 60 Hz  |
| <b>Frequency range:</b>                  | ± 5 %   |
| <b>Temperature influence:</b>            | < 0.05 % / K  |
| <b>Max. overload:</b>                    | 1.2 $U_N$ continuously  |

### Setting Ranges

|                                     |   |
|-------------------------------------|---|
| <b>Setting:</b>                     | 0.85 ... 1.05 $U_N$                                 |
| <b>Hysteresis:</b>                  | 0.75 ... 0.95 of setting value                      |
| <b>Setting accuracy:</b>            | ± 5 %   |
| <b>Repeat accuracy:</b>             | ± 0.5 %   |
| <b>Time delay <math>t_v</math>:</b> | 0.5 ... 10 s adjustable<br>( $U > 0.6 \times U_N$ ) |

### Output

|  |   |
|--|---|
| <b>Contacts:</b>   | 2 changeover contacts                   |
| <b>Thermal current <math>I_{th}</math>:</b>                  | 6 A                                     |
| <b>Switching capacity</b><br>to AC 15                        |   |
| NO contact:  | 2 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         |
| <b>Electrical contact life</b><br>to AC 15 at 1 A, AC 230 V: | $\geq 2.5 \times 10^5$ switching cycles |
| <b>Short circuit strength</b>                                |   |
| <b>max. fuse rating:</b>                                     | 4 A gL IEC/EN 60 947-5-1                |
| <b>Mechanical life:</b>                                      | $30 \times 10^6$ switching cycles       |

### General Data

|  |  |
|--|--|
| <b>Operating mode:</b>                         | Continuous operation   |
| <b>Temperature range:</b>                      | - 20 ... + 60°C  |
| <b>Clearance and creepage distances</b>        |  |
| rated impuls voltage / pollution degree:       | 4 kV / 2 IEC 60 664-1  |
| <b>EMC</b>                                     |  |
| Electrostatic discharge:                       | 6 kV (air) IEC/EN 61 000-4-2   |
| 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   |
| Interference suppression:                      | Limit value class B EN 55 011  |
| <b>Degree of protection</b>                    |  |
| Housing:                                       | IP 40 IEC/EN 60 529  |
| Terminals:                                     | IP 20 IEC/EN 60 529  |
| <b>Housing:</b>                                | Thermoplastic with V0 behaviour according to UL subject 94   |
| <b>Vibration resistance:</b>                   | Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz   |
| <b>Climate resistance:</b>                     | 20 / 060 / 04 IEC/EN 60 068-1  |
| <b>Terminal designation:</b>                   | 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 IEC/EN 60 999-1  |
| <b>Mounting:</b>                               | DIN rail IEC/EN 60 715   |
| <b>Weight:</b>                                 | 310 g  |

### Dimensions

|                                |                  |
|--------------------------------|------------------|
| <b>Width x height x depth:</b> | 45 x 73 x 132 mm |
|--------------------------------|------------------|

## UL-Data

|  |          |
|--|----------|
| <b>Nominal voltage <math>U_N</math>:</b> | AC 120 V |
|--|----------|

|                            |                 |
|----------------------------|-----------------|
| <b>Switching capacity:</b> | Pilot duty B150 |
|----------------------------|-----------------|



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

## CCC-Data

|   |     |
|---|-----|
| <b>Thermal current <math>I_{th}</math>:</b> | 5 A |
|---|-----|

|                           |
|---------------------------|
| <b>Switching capacity</b> |
|---------------------------|

to AC 15

NO contact: 2 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



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

## Standard Type

|                        |
|------------------------|
| BA 9036 AC 230 V 50 Hz |
|------------------------|

Article number: 0045288 stock item

- Nominal voltage  $U_N$ : AC 230 V
- Width: 45 mm

## Variants

BA 9036/61: with UL approval

BA 9036/001: overvoltage / closed circuit operation

BA 9036/010: overvoltage / open circuit operation / time delay

BA 9036/011: overvoltage / closed circuit operation / time delay

BA 9036/012: undervoltage / closed circuit operation / time delay

BA 9036/013: undervoltage / open circuit operation / time delay

## Ordering example for variants

BA 9036 /    AC 230 V 50 Hz

                  Nominal frequency  
                  Nominal voltage  
                  Variant, if required  
                  Type

## Characteristic

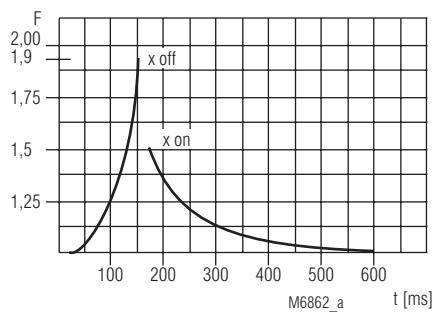


Diagram switching delay

Switching delay  $t_m$ :

The characteristic shows the switching delay depending on the values of  $X_{on}$  -  $X_{off}$  when switching the voltage on or off. A slow voltage change reduces the delay.

Example:

$$\begin{aligned} U \text{ setting} &= 200 \text{ V} & F &= \frac{230 \text{ V}}{200 \text{ V}} = 1.1 \\ U \text{ applied} &= 230 \text{ V} & & \\ t_m \text{on} &= \text{approx. } 300 \text{ ms} & F &= \frac{U \text{ applied}}{U \text{ setting}} \\ t_m \text{off} &= \text{approx. } 60 \text{ ms} & & \end{aligned}$$

## Accessories

ZWS 20 SL, ZWS 35 SL

Drop resistor

