

VARIMETER Voltage Relay BA 9036

Translation
of the original instructions



Your Advantages

- Preventive maintenance
- For better productivity
- Quicker fault locating
- Early detection of irregularities

Features

- According to IEC/EN 60255-1
- Single-phase
- Measuring ranges from 24 to 400 V
- 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

Product Description

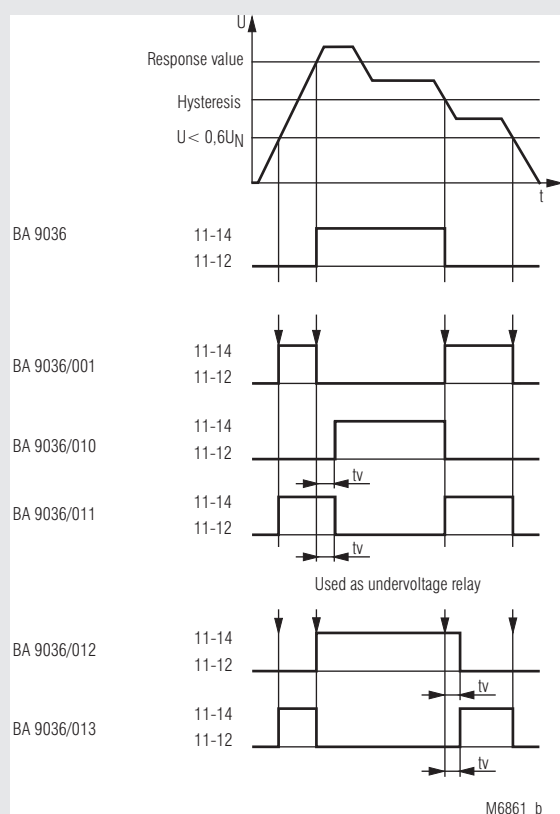
The BA 9036 voltage relay from the VARIMETER series monitors single-phase direct or alternating current networks. The device is set easily and user-friendly via rotary switches on the front of the device. Early detection and preventive maintenance help to avoid electrical system failures and thus guarantee greater operational and system safety.

Approvals and Markings



* See variants

Function Diagram



Applications

Monitoring of voltage in DC and AC systems

Indicators

Upper LED: On, when voltage connected
Lower LED: On, when output contact activated

Safety instructions



Risk of electrocution!
Danger to life or risk of serious injuries.

- The external series resistor carries voltage. It is essential to design the touch protection in accordance with applied voltage.



Risk of fire or other thermal hazards!
Danger to life, risk of serious injuries or property damage.

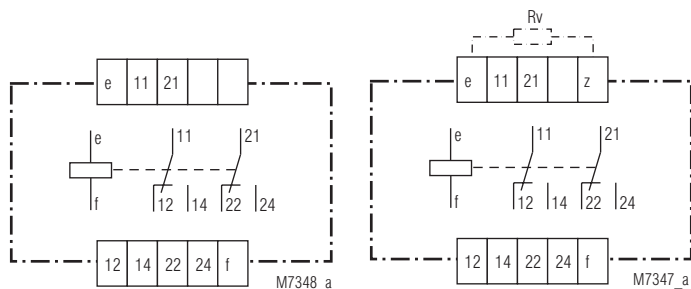
- The external series resistor becomes very hot during operation. It must therefore be mounted in a suitable location to ensure adequate touch protection. In addition, due to the heat generated, care must be taken to maintain an appropriate distance from adjacent parts.

Note

Devices with external series resistor

Variants with a DC voltage above 60 V, require an external series resistor for operation (see accessories). Resistor must be connected to terminals e and z. The measuring voltage must be applied to terminals e and f. Only the series resistor provided for this purpose may be connected to terminal z.

Circuit Diagrams



BA 9036

Connection diagram for AC voltage and DC voltages ≤ 60 V

BA 9036

Connection diagram for DC voltage DC 60 V (/100, /110, /112) DC 110, 127, 220, 240 V

Connection Terminals

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

Technical Data

Input

Nominal voltage U_N:	AC 24, 110, 127, 230, 240, 290, 400 V DC 24, 48, 60 V DC 60 V (/100, /110, /112)** DC 110*, 127*, 220*, 240 V*
	*) add. external series resistor required (see accessories and replacements)
	**) including external series resistor (see accessories and replacements)
	DC 110 V*: ZWS 20 SL1.5 k Ω 20 W DC 127 V*: ZWS 20 SL1.6 k Ω 20 W DC 220 V*: ZWS 35 SL 3.9 k Ω 35 W DC 240 V*: ZWS 35 SL4.7 k Ω 35 W
	*), **) Replacement RL 9836 without external drop resistor
Nominal consumption:	6 VA / 10 W
Nominal frequency:	50 / 60 Hz
Frequency range (constant parameter):	± 5 %
Temperature influence:	< 0.05 % / K
Max. overload:	1.2 U_N continuously

Setting Ranges

Setting range:	0.85 ... 1.05 U_N
Variant /1_ _:	0.9 ... 1.25 U_N
Hysteresis:	0.75 ... 0.95 of setting value
Setting accuracy:	± 5 %
Repeat accuracy:	± 0.5 %
Time delay t_v:	0.5 ... 10 s adjustable ($U > 0.6 \times U_N$)

Output

Contacts:	2 changeover contacts
Thermal current I_{th}:	6 A
Switching capacity to AC 15	
NO contact:	2 A / AC 230 V IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60947-5-1
To DC 13	
NO contact:	1 A / DC 24 V IEC/EN 60947-5-1
NC contact:	1 A / DC 24 V IEC/EN 60947-5-1
Electrical contact life at 6 A, AC 230 V $\cos \varphi = 1$:	1.5 x 10 ⁵ switching cycles
Short circuit strength	
max. fuse rating:	4 A gG / gL IEC/EN 60947-5-1
Mechanical life:	30 x 10 ⁶ switching cycles

Technical Data

General Data

Operating mode:	Continuous operation
Temperature range	
Operation:	- 20 ... + 60 °C
Storage:	- 20 ... + 60 °C
Altitude:	≤ 2000 m
Clearance and creepage distances	
Rated impulse voltage / pollution degree:	4 kV / 2 IEC 60664-1
Overvoltage category:	III up to 300 V II > 300 V

EMC

Electrostatic discharge:	8 kV (air) IEC/EN 61000-4-2
HF irradiation	
80 MHz ... 2.7 GHz:	10 V / m IEC/EN 61000-4-3
Fast transients:	2 kV IEC/EN 61000-4-4
Surge voltages between	
wires for power supply:	1 kV IEC/EN 61000-4-5
Between wire and ground:	2 kV IEC/EN 61000-4-5
HF wire guided:	10 V IEC/EN 61000-4-6
Interference suppression:	Limit value class B EN 55011

Degree of protection

Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529

Housing:

Vibration resistance:

Climate resistance:	
Terminal designation:	20 / 060 / 04 IEC/EN 60068-1
Wire connection:	EN 50005
	2 x 2.5 mm ² solid or
	2 x 1.5 mm ² stranded wire with sleeve
	DIN 46228-1/-2/-3/-4

Insulation of wires or sleeve length:

Wire fixing:

Fixing torque:

Mounting:

Weight:

Dimensions

Width x height x depth:	45 x 73 x 132 mm
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CCC-Data

Thermal current I_{th} : 5 A

Switching capacity

to AC 15

NO contact: 2 A / AC 230 V IEC/EN 60947-5-1

To DC 13

NO contact: 1 A / DC 24 V IEC/EN 60947-5-1



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

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

Variants

BA 9036:	Undervoltage / closed circuit operation, with CCC approval on request
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
BA 9036/100:	See BA 9036, but with setting range 0.9 ... 1.25 U_N
BA 9036/110:	See BA 9036/010, but with setting range 0.9 ... 1.25 U_N
BA 9036/112:	See BA 9036/012, but with setting range 0.9 ... 1.25 U_N

Ordering example for variants

BA 9036	/	AC 230 V	50 Hz	
				Nominal frequency
				Nominal voltage
				Variant, if required
				Type

Characteristic

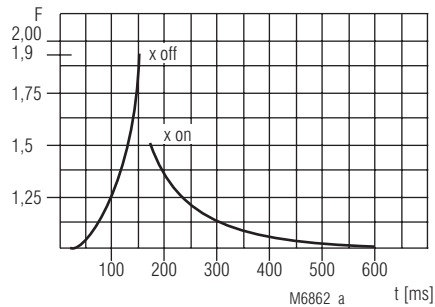


Diagram switching delay

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:

$$U_{\text{setting}} = 200 \text{ V} \quad F = \frac{230 \text{ V}}{200 \text{ V}} = 1.1$$

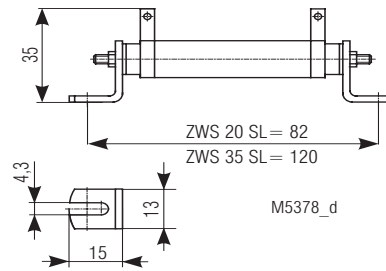
$$U_{\text{applied}} = 230 \text{ V}$$

$$t_{M, \text{on}} = \text{Approx. } 300 \text{ ms} \quad F = \frac{U_{\text{applied}}}{U_{\text{setting}}}$$

$$t_{M, \text{off}} = \text{Approx. } 60 \text{ ms}$$

Accessories

ZWS 20 SL, ZWS 35 SL Series resistor



ZWS 20 SL 1.5 k Ω 20 W: Series resistor for variant DC 110 V
Article number: 0004961

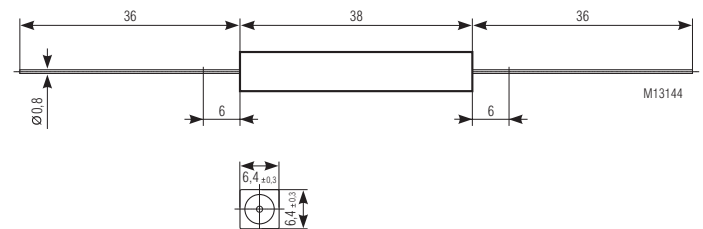
ZWS 20 SL 1.6 k Ω 20 W: Series resistor for variant DC 127 V
Article number: 0005931

ZWS 35 SL 3.9 k Ω 35 W: Series resistor for variant DC 220 V
Article number: 0004973

ZWS 35 SL 4.7 k Ω 35 W: Series resistor for variant DC 240 V
Article number: 0012915

Replacement

ZWS 7 SL Series resistor



ZWS 7 SL 1.0 k Ω 7 W: Series resistor for variant DC 60 V
(/100, /110, /112)
Article number: 0064601

