

VARIMETER

Battery Symmetry Monitor BA 9054/331, BA 9054/332



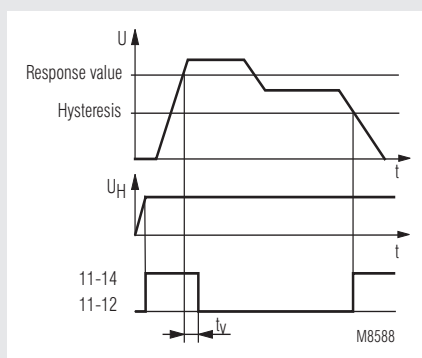
BA 9054/331

- According to IEC/EN 60 255
- To monitor for battery systems (emergency power supply)
- Measuring rang DC 0.12 ... 1.2 V or 0.2 ... 2 V
- Without separately auxiliary voltage
- High overload possible
- With time delay 10 s
- LED indicators for operation and contact position
- Width: 45 mm

BA 9054/332

- as BA 9054/331 but with
- battery voltages up to 500 V
 - separately auxiliary voltage

Function Diagram



Approvals and Marking



Applications

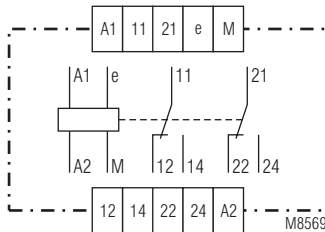
Monitoring of battery systems to find voltage inversions of single cells, internal short circuits and sulphating

Function

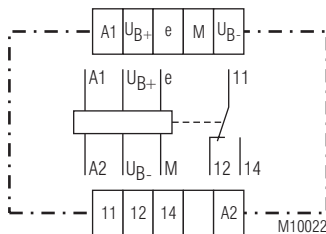
The middle connection of a Battery system is connected to terminal "M" of the BA 9054/331. If the two parts of the voltage differ more then the adjusted value for 10 s, the output relay trips. It trips also on broken wire on terminal "M".

The test button allows a test of the unit. It has to be pressed for at least 10 sec.

Circuit Diagram



BA 9054/331



BA 9054/332

Indicators

- | | |
|-------------------|-------------------------------------|
| green upper LED: | on, when auxiliary supply connected |
| yellow lower LED: | on, when output relay acitvated |

Remark

Attention: New batteries are not symmetric in the beginning. The battery monitor has to be readjusted after some time of operation. (see setting). The adjustment has to be verifi



Technical Data

Input

Sensitivity of tripping: (Measuring range):	DC 0.12 ... 1.2 V absolute scale or DC 0.2 ... 2 V absolute scale
Resetting value:	98% of operate value, fixed
Repeat accuracy:	≤ ± 0.5 %
Time delay t_v:	10 s
Current middle connection (terminal M):	max 12 µA (bei 60 V bzw. 220 V)
Principe de mesure:	arithmetic mean value
Temperature influence:	< 0.05 % / K

Auxiliary Circuit

BA 9054/331:	
Battery voltage = auxiliary voltage:	DC 24 ... 60 V / DC 110 ... 220 V
Voltage range:	DC 19 ... 80 V / DC 60 ... 300 V
BA 9054/332:	
Battery voltage (U_B):	DC 200 ... 500 V
Auxiliary voltage (A1/A2):	AC 230 V
Voltage range:	0.8 ... 1.1 U_H
Nominal consumption:	approx. 2.5 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts:	2 changeover contacts with 5µm gold contacts max. DC 60 V / 300 mA	
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:	8 A / DC 24 V or 0.3 A / DC 220 V	
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10 ⁵ switching cycles	
Short-circuit strength max. fuse rating:	6 AgL	IEC/EN 60 947-5-1
Mechanical life:	50 x 10 ⁶ switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 40 ... + 60°C	
Clearance and creepage distances rated impuls voltage/ pollution degree		
In-/output:	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:	4 kV	IEC/EN 61 000-4-4
Surge voltages between		
wires for power supply:	2 kV	IEC/EN 61 000-4-5
between wire and ground:	4 kV	IEC/EN 61 000-4-5
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:	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	
Mounting:	DIN rail IEC/EN 60 715	
Weight:	200 g	

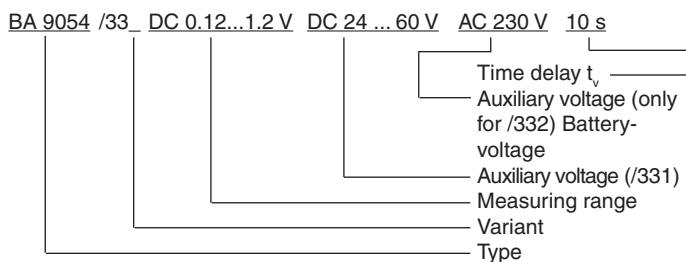
Dimensions

Width x height x depth:	45 x 75 x 120 mm
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Standard Types

BA 9054/331	DC 0.12 ... 1.2 V	DC 24 ... 60 V	10 s
Article number:	0056172		
• Measuring range:	DC 0.12 ... 1.2 V		
• Auxiliary voltage:	DC 24 ... 60 V		
• Time delay:	10 s		
• Width:	45 mm		
BA 9054/331	DC 0.12 ... 1.2 V	DC 110 ... 220 V	10 s
Article number:	0056204		
• Measuring range:	DC 0.12 ... 1.2 V		
• Auxiliary voltage:	DC 110 ... 220 V		
• Time delay:	10 s		
• Width:	45 mm		
BA 9054/332	DC 0.12 ... 1.2 V	DC 200 ... 500 V	10 s
Article number:	0062251		
• Measuring range:	DC 0.12 ... 1.2 V		
• Auxiliary voltage:	AC 230 V		
• Battery voltage:	DC 200 ... 500 V		
• Time delay:	10 s		
• Width:	45 mm		

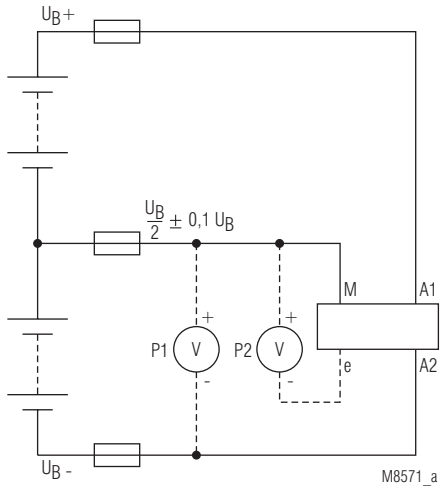
Ordering example



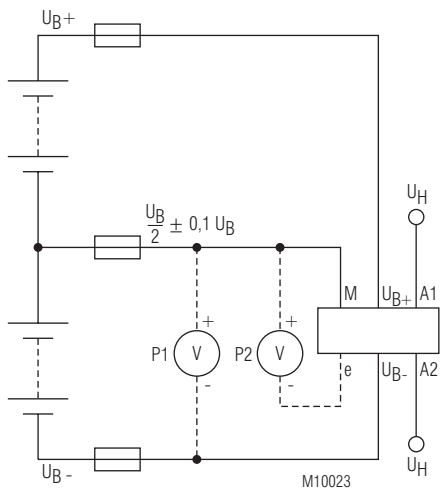
Setting

- Connect the device as shown in application example
- Connect nominal voltage (battery voltage) to A1/A2 (/331 e.g. U_B /332).
- Set potentiometer for response value to min setting (0.12 V)
- Connect auxiliary U_H (/332) to A1, A2
- Find the middle of the battery voltage with the potentiometers for symmetry "grob" and "fein" (tuning and fine tuning). Differences of block batteries can be adjusted up to 12 V. The correct setting is indicated by a green LED.
- Adjust potentiometer for response value to the required value. The device is now ready to use.

Application Example



BA 9054/331



BA 9054/332

Set-up

Example 1

Symmetric battery

$P1 = \frac{1}{2}$ battery voltage

Adjust P2 with tuning and fine tuning potentiometer to 0V

Example 2

60 V battery set, combination of 12 V Block batteries

$P1 = 36$ V

Adjust P2 with tuning and fine tuning potentiometer to 0V

Example 3

Non symmetric battery (compensation of battery tolerances)

$P1 = \frac{1}{2}$ battery voltage + 200 mV

Adjust P2 with tuning and fine tuning potentiometer to 200 mV

