

# SB146

Fault voltage monitor



# SB146


**SB146**
**Device features:**

- Voltage monitoring of 6 secondary circuits of welding transformers
- Alarm LEDs for fault voltage per channel, PE/KE interruption, interruption of the measuring line
- Connection monitoring of measuring line and earth connection
- Fault memory
- Reset button
- 1 potential-free changeover contact
- 45 mm enclosure

**Product description**

The relays of the SB146 series monitor the secondary circuits of welding transformers for fault voltages. A total of six secondary circuits can be monitored.

**Typical applications**

- Monitoring of welding equipment according to DIN VDE 0545 (VDE 0545-1)

**Function**

Both measuring connections (z.B. E1/E2) are connected to different points on the same secondary circuit. Also the two earth connection terminals are connected to the PE conductor (PE) at different points. If the measured fault voltage value exceeds the response value, the alarm LED of the respective measuring circuit lights up and the alarm relay switches. The alarm relay works in N/C operation so that in the event of supply voltage failure a message is ensured.

When the fault (touch voltage) has been eliminated, the alarm relay switches back to its original state and the alarm LED goes out after pressing the reset button.

To ensure a safe condition, the connecting leads to the welding circuits being monitored and the connecting leads to earth are continuously monitored. If one or several measurement or earth connections are interrupted, the alarm relay switches.

In addition, the alarm LED ON (interruption earth connection) and/or-the alarm LED of the respective channel flashes.

The device function can be tested by pressing the test button.

**Alarm messages**

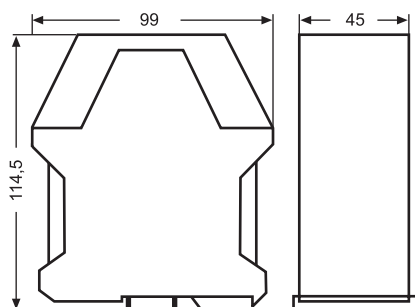
| Condition |          |            |      | Messages |         |              |
|-----------|----------|------------|------|----------|---------|--------------|
| $U_s$     | $U_{F>}$ | Connection |      | LED      |         | Relay        |
|           |          | System     | PE   | ON       | "E...K" |              |
| on        | –        | OK         | OK   | ■        | –       | on           |
| on        | –        | open       | OK   | ■        | flashes | de-energised |
| on        | ■        | OK         | OK   | ■        | on      | de-energised |
| on        | –        | OK         | open | flashes  | –       | de-energised |
| off       | –        | –          | –    | –        | –       | de-energised |

**Ordering information**

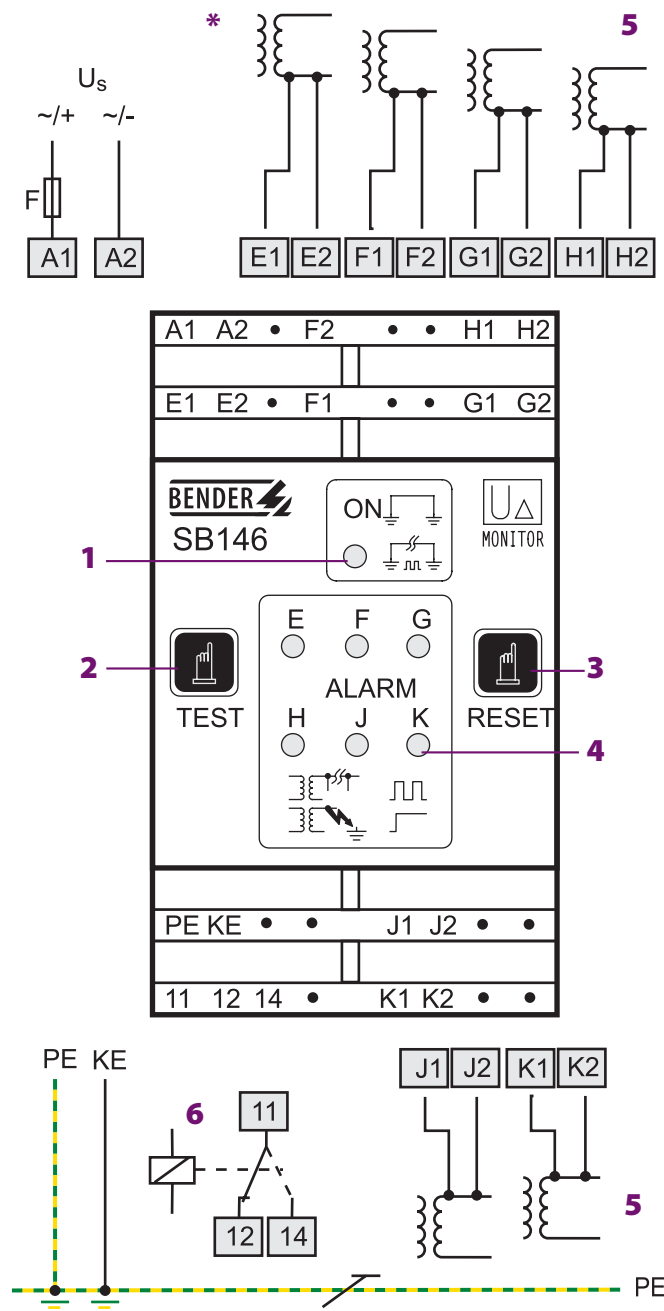
| Supply voltage $U_s$ |            | Type     | Art. No.    |
|----------------------|------------|----------|-------------|
| AC                   | DC         |          |             |
| 10...65 V            | 10...90 V  | SB146-34 | B 9308 3017 |
| 65...276 V           | 90...308 V | SB146-35 | B 9308 3018 |

**Dimension diagram**

Dimensions in mm



Wiring diagram



- 1 - Power On LED "ON":
  - lights during operating mode
  - flashes in case of interruption of the connection PE/KE
- 2 - Test button "TEST"
- 3 - Reset button "RESET"
- 4 - Alarm LEDs
  - light in the case of fault voltage
  - flash in case of a fault in the connection monitoring
- 5 - Welding transformers monitored
- 6 - Alarm relay in N/C operation (marked by dotted lines: without fault voltage)
- 7 - 6 A fuse recommended.
- 8 - Unassigned inputs have to be bridged individually

Technical data

Insulation coordination acc. to IEC 60664-1

|  |          |
|--|----------|
| Rated insulation voltage               | AC 800 V |
| Rated impulse voltage/pollution degree | 6 kV/3   |

Supply voltage

|                      |                          |
|----------------------|--------------------------|
| Supply voltage $U_s$ | see ordering information |
| Power consumption    | $\leq 3$ VA              |

Measuring circuit

|   |                              |
|---|------------------------------|
| Nominal system voltage $U_n$                    | 600 V                        |
| Nominal voltage range                           | 0...1.15 x $U_n$             |
| Response value                                  |                              |
| $U_f$ for sinusoidal voltages                   | AC 21.6...24 V, 50...1000 Hz |
| $U_f$ for DC voltages                           | DC 19...24 V                 |
| Response time $t_{an}$ at $1.1 \times U_{Fmax}$ | $\leq 100$ ms                |
| Response time for coupling monitoring           | $\leq 5$ s                   |
| Recovery time $t_b$                             | $\leq 500$ ms                |

Switching elements

|                               |               |
|-------------------------------|---------------|
| Number of changeover contacts | 1 x 1         |
| Operating principle           | N/C operation |

Fault memory behaviour

|  |   |
|--|---|
| Electrical endurance, number of cycles | 12000   |
| Contact class IEC 60255-0-20           | IIB   |
| Rated contact voltage                  | AC 250 V/DC 300 V   |
| Making capacity                        | AC/DC 5 A   |
| Breaking capacity                      | 2 A, AC 230 V, $\cos \phi$ 0.4<br>0.2 A, DC 220 V, L/R = 0.04 s |

Environment/EMC

|  |  |
|--|--|
| EMC immunity   | acc. to IEC 61000-6-2                          |
| EMC emission   | acc. to IEC 61000-6-4                          |
| Shock resistance IEC 60068-2-27 (device in operation)        | 15 g/11 ms                                     |
| Bumping IEC 60068-2-29 (transport)                           | 40 g/6 ms                                      |
| Vibration resistance IEC 60068-2-6 (device in operation)     | 1 g/10...150 Hz                                |
| Vibration resistance IEC 60068-2-6 (device not in operation) | 2 g/10...150 Hz                                |
| Ambient temperature, during operation                        | -10...+55 °C                                   |
| Ambient temperature for storage                              | -45...+70 °C                                   |
| Climatic class acc. to IEC 60721-3-3                         | 3K5 (except condensation and formation of ice) |

Connection

|  |                            |
|--|----------------------------|
| Connection type                            | modular terminals          |
| Connection properties single wire/flexible | 0.14...2.5 mm <sup>2</sup> |

Other

|   |                      |
|---|----------------------|
| Operating mode  | continuous operation |
| Mounting  | any position         |
| Degree of protection, internal components (IEC 60529) | IP30                 |
| Degree of protection, terminals (IEC 60529)           | IP30                 |
| Screw mounting  | no                   |
| DIN rail mounting acc. to                             | IEC 60715            |
| Flammability class                                    | UL94V-0              |
| Operating manual                                      | BP308008             |
| Weight  | $\leq 210$ g         |



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