SB146
Fault voltage monitor
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

<table>
<thead>
<tr>
<th>$U_S$</th>
<th>$U_t&gt;$</th>
<th>Connection</th>
<th>Messages</th>
<th>Relay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>System</td>
<td>PE</td>
<td>ON</td>
</tr>
<tr>
<td>on</td>
<td>–</td>
<td>OK</td>
<td>OK</td>
<td>–</td>
</tr>
<tr>
<td>on</td>
<td>–</td>
<td>open</td>
<td>OK</td>
<td>–</td>
</tr>
<tr>
<td>on</td>
<td>–</td>
<td>OK</td>
<td>OK</td>
<td>–</td>
</tr>
<tr>
<td>on</td>
<td>–</td>
<td>OK</td>
<td>open</td>
<td>flashes</td>
</tr>
<tr>
<td>off</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Ordering information

<table>
<thead>
<tr>
<th>Supply voltage $U_S$</th>
<th>Type</th>
<th>Art. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10…65 V 10…90 V</td>
<td>SB146-34</td>
<td>B 9308 3017</td>
</tr>
<tr>
<td>65…276 V 90…308 V</td>
<td>SB146-35</td>
<td>B 9308 3018</td>
</tr>
</tbody>
</table>

Dimension diagram
Dimensions in mm
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 AC 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 $t_{fp}$ at 1.1 x $U_{MAX}$ $\leq 100$ ms
Response time for coupling monitoring $\leq 5$ s
Recovery time $t_o$ $\leq 500$ 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
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 60664-2-27 (device in operation) 15 g/11 ms
Bumping IEC 60664-2-39 (transport) 40 g/6 ms
Vibration resistance IEC 60664-2-6 (device in operation) 1 g/10…150 Hz
Vibration resistance IEC 60664-2-6 (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 mm²

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