STATIC BREAKER BACK-UP RELAY

TYPE SBC99AB
<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>3</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>3</td>
</tr>
<tr>
<td>APPLICATION</td>
<td>3</td>
</tr>
<tr>
<td>OPERATION OF THE SBC99AB</td>
<td>4</td>
</tr>
<tr>
<td>OPERATING PRINCIPLES</td>
<td>4</td>
</tr>
</tbody>
</table>
STATIC BREAKER BACK-UP RELAY

TYPE SBC99AB

INTRODUCTION

These instructions, together with those in the attached book GEK-45464, form the instructions for the SBC99AB relays.

DESCRIPTION

The SBC99AB is similar to the SBC23A with the following exceptions:

1. A contact converter provides for per-phase contact supervision of input to overcurrent level detector in addition to the normal DC input control.

2. The residual element (3I0) has been eliminated.

The type SBC99AB relay is packaged in an M2D drawout case and contains the following basic components:

1. Input provisions for contact initiation that activates the power supply and provides per-phase supervision of the input to the overcurrent level detector. In addition, provision is made for a single DC input which activates the power supply and provides input to the overcurrent level detector from all three phases.

2. A fast reset current detector with one adjustable pickup setting for phase (Ia, Ib, Ic).

3. An adjustable timer to provide time for the primary breaker to operate correctly.

4. Three electrically separate contact output circuits (BFT) with two circuits having electromechanical series targets for tripping the back-up breakers.

5. A regulated power supply

6. Surge suppression on all AC and DC input circuits.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.
The external connections and logic diagram for the SBC99AB are shown in Fig. 1. The internal connection diagram is shown in Fig. 2. The "A," "B," and "Y" cards are the same as used for the SBC23A relay. A "C" card provided for the SBC99AB relay is shown in Fig. 3. The full wave bridges ("X" card) have been revised and are shown in Fig. 4.

* The differences between the forms of SBC99AB relays are indicated below:

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<thead>
<tr>
<th>FORM</th>
<th>VDC</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>125</td>
<td>60 Hz</td>
</tr>
<tr>
<td>002</td>
<td>220</td>
<td>50 Hz</td>
</tr>
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**APPLICATION**

The SBC99AB relay is intended for use as a relay to detect that current is still flowing in a breaker pole as that pole has been tripped and thus current should disappear. This relay is similar to the SBC23A in this respect except it is designed specifically to be applied in those applications where a single phase of the three phase breaker may be selected to be opened with the other poles continuing to carry current. For an elementary of a typical application refer to Fig. 1.

**OPERATION OF THE SBC99AB**

This special relay is similar to the SBC23A relay and contains only the basic components except that a contact converter card is provided for phase supervision. When the power supply is activated (terminal 7 for phase A, terminal 8 for phase B, terminal 9 for phase C and terminal 17 for all three phases), the level detector produces an output that energizes the A/O timer if the current exceeds the pickup level. If the timer is energized longer than its setting, it indicates that the primary breaker has failed to clear the fault. The pickup (A) of the timer should be set long enough to give the breaker a chance to trip but short enough to ensure system stability and maximum continuity of service by operating faster than remote second zone relays. Once the A/O timer operates it energizes a transistor switch that in turns picks up BFT. If the primary breaker had cleared the fault then either the contact initiation or the level detector would have dropped out before the timer could have timed out and no back-up tripping would take place.

**OPERATING PRINCIPLES**

The operating principles of the SBC99AB relay are the same as the SBC23A except for the following:

1. The new "C" card (contact converter) is provided which has no similarity to the "C" card listed in the GEK-45464 instruction book.
2. The "X" card has been modified to provide for three isolated full wave rectifier circuits.

3. The circuit between the "X" card and the "A" card has been modified.

The "X" card for the SBC99AB has three isolated diode bridges so that the input for each phase is isolated for independent control.

The "C" card has a relay for each phase so that phase supervision can be provided by an external DC input to operating coil of each relay. Means is also provided by diodes to energize all three phases simultaneously. Diodes also are provided so that the relay power supply will be energized simultaneously with the DC input to any or all of the relay operating circuits.

On the "C" card, one contact of each relay is connected together so that the net output will be determined by which relay or relays are closed. The internal connection diagram on Fig. 2 shows that the input level to the "A" card is controlled by the same calibration circuit. However, the output from each bridge on the "X" card uses a common zener diode where each phase is isolated by diodes.
*Fig. 1 (0273A9043-1) External Connection Diagram for SBC99AB

*Indicates Revision
Fig. 2 (0273A9040-2) Internal Connection Diagram for SBC99AB Relay

*Indicates Revision
Fig. 3 (0273A9041-1) Contact Converter "C" Card

V.D.C. R1, R2, R3 VALUE
125 10K Ω, 5W
220 18K Ω, 5W
250 22K Ω, 5W

D1-6 = 1N5061
Si1-3 = REED RELAY
R1-3 = 1/2W, ±5%

PC CARD ASM 0165B4686G7
Fig. 4 (0273A9042-0) Full Wave Bridges "X" Card