Circuit Shield®

Type 60
Voltage Balance Relay

Application
The Type 60 Voltage Balance Relay provides fast differential voltage detection for three-phase systems. A typical application is that of detecting a blown fuse in a potential transformer circuit, and to prevent improper tripping or malfunction of other devices as a result of loss of voltage.

The relay is used in conjunction with auxiliary relays to open trip circuits of voltage controlled overcurrent relays, block regulating equipment, sound alarms, or other functions as required by the installation. The relay has two form C contacts: 60A transfers when line A is low, compared to line B, and 60B transfers when line B is low, compared to line A.

Features
- Seismic capability to 6g ZPA
- Transient immunity
- Fast operation
- Drawout construction
- Memory, shockproof target
- Built-in-test
- 2 year warranty

Typical Circuit Shield Voltage Balance Relay Application
Specifications

Differential Sensitivity: 12, 24, 36, 48 Volts
Operating Time: Less than 1 cycle for a blown fuse.
Reset Time: 1.0 Second
Input Circuit Rating: 160V continuous, 50/60 Hz
Burden: 0.2 VA, 1.0 P.F. at 120 Volts
Control Power: 48/125 Vdc, 24/32 Vdc
Output Circuit: 2 form C contacts
Output Rating: Each Contact:
30 Amps, Tripping Duty
5 Amps, Continuous
1 Amp, Opening Resistive
0.3 Amp, Opening Inductive
Operating Temperature: Minus 20° to plus 70°C
Transient Immunity: More than 2500V, 1 MHz bursts at 400 Hz repetition rate, continuous (ANSI C37 90.1 SWC);
Fast Transient Test;
EMI Test
Seismic Capability: More than 6g ZPA biaxial broadband multi-frequency vibration without damage or malfunction (ANSI/IEEE C37.98)
Dielectric: 2000 Vac RMS, 60 seconds all circuits to ground

Figure 1. Typical Operating Time

Figure 2. Differential Voltage Characteristics

Figure 3. Typical Seismic Testing Results

How To Specify

The Voltage Balance Relay shall provide protection against blown potential transformer fuses by means of voltage differential between two three-phase lines. Relay shall be Asea Brown Bovery Type 60 or approved equal, capable of withstanding up to 6g ZPA seismic stress without damage or malfunction. Relay shall have a magnetic operation indicator which retains position on loss of control power. Built-in means shall be provided to allow operational tests without additional equipment. Operating time shall be less than .016 seconds in response to a blown fuse.

Further Information

List Prices: PL 41-020
Technical Data: TD 41-025
Instruction Book: IB 7.4.1.7-4
Generator Protection Paper: TP 18.6-3
Other Protective Relays:
Application Selector Guide, TD 41-016

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November, 1990
Type 60 Voltage Balance Relay

<table>
<thead>
<tr>
<th>Type</th>
<th>Maximum Voltage Rating</th>
<th>Tap Range</th>
<th>Pickup</th>
<th>Dropout</th>
<th>Output Contacts</th>
<th>Internal Connections</th>
<th>Control Voltage</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>160V 50/60 Hz</td>
<td>12-48V</td>
<td>High</td>
<td>Definite</td>
<td>1 sec.</td>
<td>2-C</td>
<td>16D211E</td>
<td>48/125 Vdc</td>
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<td>Unbalanced</td>
<td>Speed</td>
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<td></td>
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<td>48/110 Vdc</td>
<td>412A1105</td>
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<td>24/32 Vdc</td>
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<td>250 Vdc</td>
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For other control voltages contact the nearest ABB Representative.

To place an order, or for further information, contact the nearest ABB Representative.

Internal Connection Diagrams

Note: Refer to Instruction Book IB 7.4.1.7-4 for contact logic data.