

September 1995
Supersedes Descriptive Bulletin 41-237S,
pages 1-2, dated January 1991
Mailed to: E, D, C/41-200B

Device Number: 59

CIRCUIT SHIELD® Type 59G Ground Voltage Relay

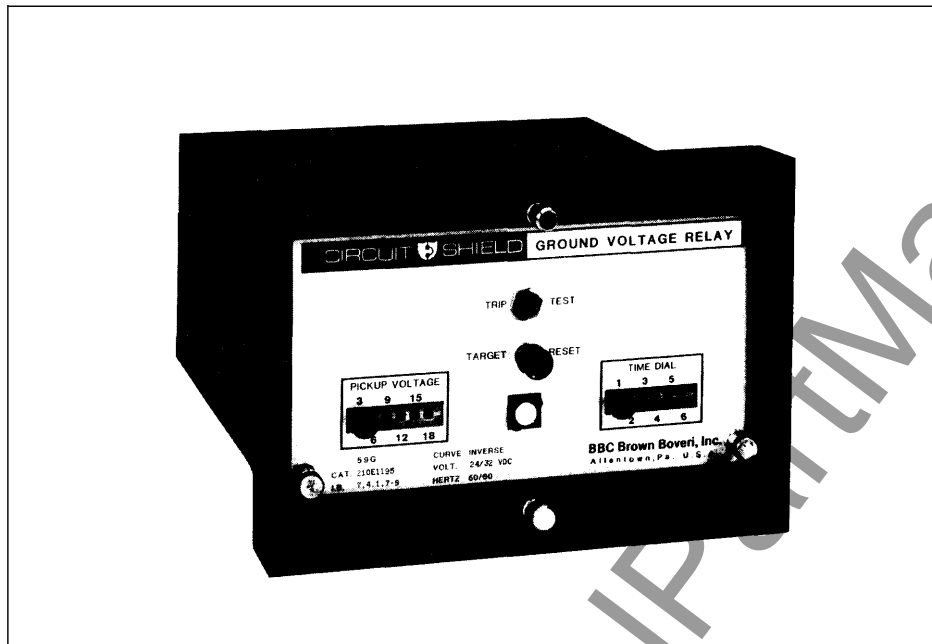
Application

The Type 59G Ground Voltage Relay is used primarily to protect generators against ground faults. It may also be applied for the detection of ground faults on ungrounded systems, and in capacitor bank protection schemes to monitor the difference in neutral voltages between banks or the neutral to ground voltage in a single bank.

The Type 59G is a low pickup overvoltage relay which responds to 60 Hz voltages. The relay has a third harmonic rejection circuit which renders it insensitive to 180 Hz voltages. In addition, the relay is frequency compensated down to 5 Hz. These characteristics allow the use of the relay for the primary, startup, and backup protection. The high sensitivity of the relay typically provides protection for over 95% of the generator winding. Should 100% stator ground fault protection be desired, the Type 27G may be added to the scheme (refer to Descriptive Bulletin 41-726S).

The Type 59G has a high continuous rating of 208 volts, which permits omission of external relays usually required in the sensitive protection schemes to disconnect the relay from the source.

Due to these simplifications, the Type 59G provides system economics, increased reliability, and increased sensitivity.



Features

- 1 volt sensitivity
—Lowest in the industry
- Sensitivity down to 5 Hz
- No response to 3rd harmonic
- Seismic capability to 6g ZPA
- Transient immunity
- Drawout construction
- 2 year warranty

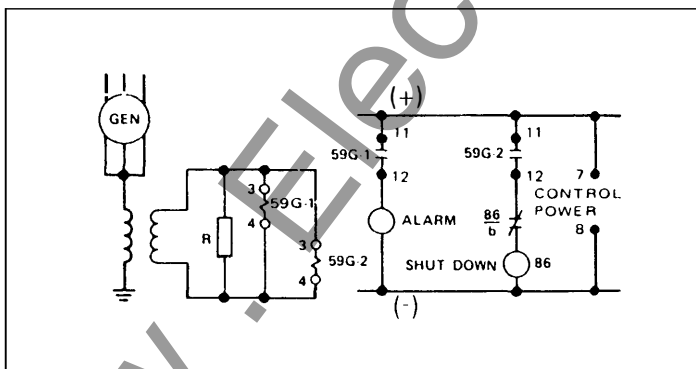


Figure 1. Typical Application of Type 59G

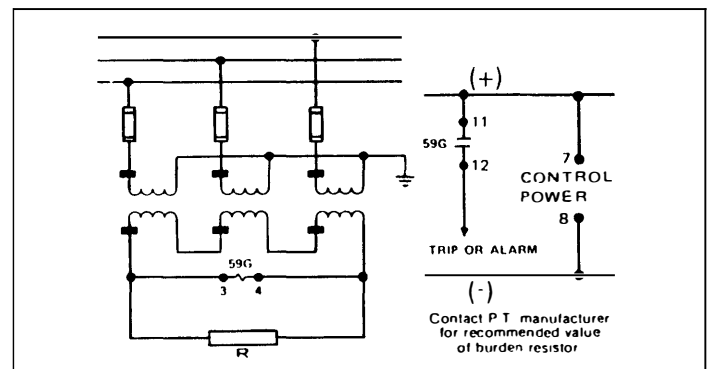


Figure 2. Typical Connections for Ground Fault Protection on Ungrounded Systems.

Specifications

- Pickup Taps:** 3, 6, 9, 12, 15, 18 Volts, or
1, 2, 3, 4, 5, 6 Volts
- Time Delay:** 6 Taps, with inverse curves
- Instantaneous:** Less than 65 ms. at 2 times pickup
- Input Circuit Rating:** 208V, continuous
480V, 10 seconds
- Burden:** 1.2 VA, 1.0 p.f. at 120V
- Control Power:** 48/125 Vdc, 48/110 Vdc,
24/32 Vdc, 120 Vac, 250 Vdc
Burden: 0.05A max. all control voltages
- 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
- Seismic Capability:** More than 6g ZPA (ANSI/IEEE C37.98)
without damage or malfunction.
- Transient Immunity:** More than 2500V, 1MHz bursts at 400 Hz
repetition rate, continuous
(ANSI C37.90.1 SWC);
Fast Transient Test; EMI Test
- Dielectric:** 2000 Vac rms, 60 seconds, all circuits to
ground

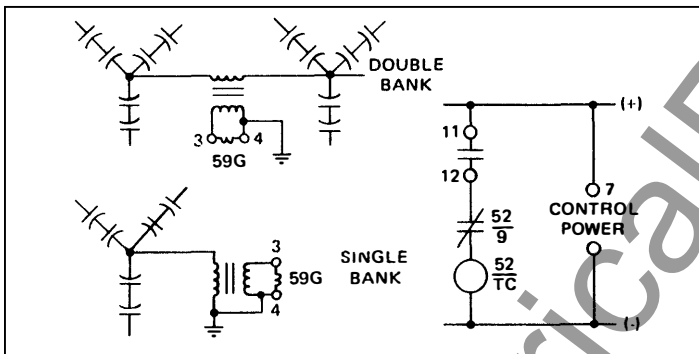


Figure 3. Typical Connections for Capacitor Bank Protection

How to Specify

Voltage relay for (generator ground-fault protection) OR (ground-fault detection on ungrounded systems): Relay shall be Asea Brown Boveri Type 59G or approved equal, drawout case, capable of withstanding up to 6g ZPA seismic stress without damage or malfunction, at minimum voltage and time settings. Relay shall have a minimum setting of (1), (3) volts and continuous rating of 208 volts or more. Built-in means shall be provided to allow operational tests without additional equipment.

How To Order

For a complete listing of available versions of Circuit Shield voltage relays see TD 41-025. To place an order, or for further information, contact the nearest ABB Representative.

Further Information

List Prices: PL 41-020
Technical Data: TD 41-025
Instruction Book: IB 7.4.1.7-9
Other Protective Relays:
Application Selector Guide, TD 41-016

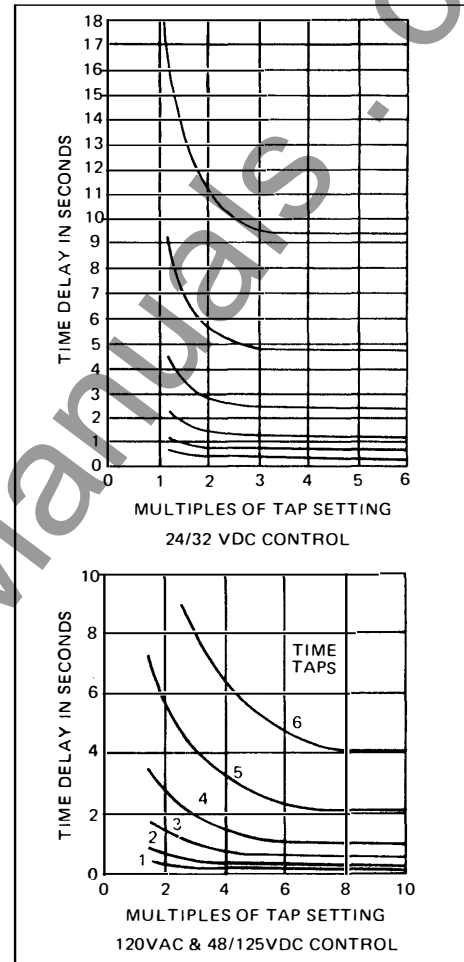


Figure 4. Time-Delay Curves

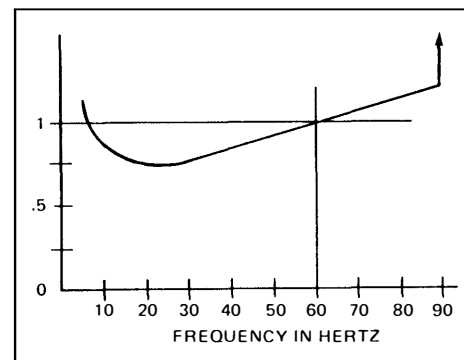


Figure 5. Frequency Response

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CIRCUIT SHIELD[®] Type 59G Ground Voltage Relay

| Type | Max. Voltage Rating | Pickup | | | Output Contacts | Internal Connections | ① Control Voltage | Catalog Number | |
|----------------------|---------------------|-----------|------------|-------------|-----------------|----------------------|-------------------|----------------|----------|
| | | Tap Range | Curve | Time | | | | | |
| 59G See Note 1 | 208V 5-120 Hz | 3-18V | Inverse | 0.4-16 sec. | 2-C | 16D210A | 24/32 Vdc | 410E1195 | |
| | | | | | | | 48/125 Vdc | 410E1175 | |
| | | | | | | | 48/110 Vdc | 410E1105 | |
| | | | | | | | 16D211N | 220 Vdc | 410E1125 |
| | | | | | | | 250 Vdc | 410E1155 | |
| | | | | | | | 16D210A | 120 VAc | 410E1165 |
| | | | 1-6V | 24/32 Vdc | 410E1295 | | | | |
| | | | | 48/125 Vdc | 410E1275 | | | | |
| | | | | 48/110 Vdc | 410E1205 | | | | |
| | | | | 16D211N | 220 Vdc | 410E1225 | | | |
| | | | | 250 Vdc | 410E1255 | | | | |
| | | | | 16D210A | 120 Vac | 410E1265 | | | |
| | | 20-70V | 24/32 Vdc | 410E1395 | | | | | |
| | | | 48/125 Vdc | 410E1375 | | | | | |
| | | | 48/110 Vdc | 410E1305 | | | | | |
| | | | 16D211N | 220 Vdc | 410E1325 | | | | |
| | | | 250 Vdc | 410E1355 | | | | | |
| | | | 16D210A | 120 Vac | 410E1365 | | | | |
| | | | 120 Vac | 410E0365② | | | | | |

Note 1. For capacitor bank protection add suffix -HF to catalog number.

① For other control voltages contact the nearest ABB Representative.

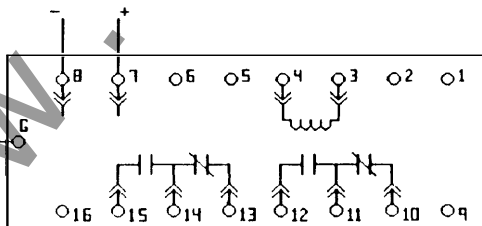
② All Type 59G listed above are available with instantaneous characteristic. Change the 5th digit in the catalog number from "1" to "0".

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

Internal Connection Diagram

Note: Refer to Instruction Book IB 7.4.1.7-9 for contact logic data.

16D210A
Single-Phase Voltage Relays
Drawout Test Case



16D211N
Single-Phase Voltage Relays
Drawout Test Case

