



# Solid State VersaTrip<sup>®</sup> with Ground Fault "GR" Suffix

For J, K and Power-Break<sup>™</sup> Frames

## GENERAL

VersaTrip with Type "GR" integral ground fault protection incorporates an external sensor to measure ground fault current directly as it returns to the power source. The output signal from this sensor is fed to a terminal board on the Type "GP" VersaTrip breaker. The VersaTrip programmer analyzes this signal. If it is greater than the preselected current and time settings the breaker is automatically tripped. Removal of the external sensor eliminates the ground fault function.

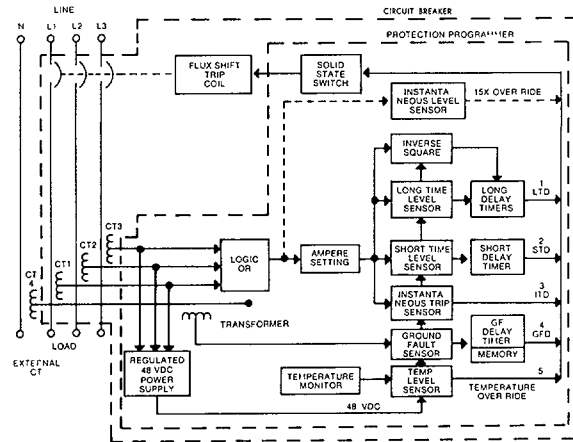


Figure 1 - VersaTrip Type "GR" functional block-diagram

## GROUND FAULT PROTECTION GFP SCHEMES

There are two GFP schemes that can be used with 3-phase 4-wire double-ended equipment. In the first method, shown in Fig. 2, the two main breakers and the tie breaker are provided with VersaTrip-GR ground fault protection. In the second method, shown in Fig. 3, the main breakers only are provided with VersaTrip-GR ground fault protection, and the tie breaker is not tripped for GFP.

The most selective tripping is provided when all three breakers are equipped with GFP (Fig. 2). See comparison of the two schemes in the table.

The two VersaTrip GFP schemes described here are applicable to 3-phase 4-wire double-ended equipment where the system will not be operated with all three breakers closed.

Condition	Mains & Tie Tripped by VersaTrip GFP	Mains Only Tripped by VersaTrip GFP
Mains closed, tie open	Main that supplies the faulted bus will open, other main stays closed	Main that supplies the faulted bus will open, other main stays closed
One main and tie closed, other main open	If ground fault is on load side of tie, the tie will open and main stays closed. If ground fault is on line side of tie, both main and tie will open.	Main that supplies both buses will open for a ground fault on either bus.

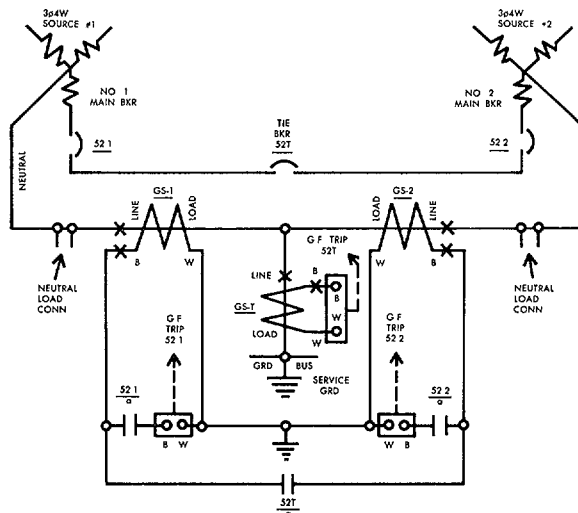


Figure 2 - Double-Ended Switchboard with VersaTrip Ground Fault Protection - Mains and Tie Tripped for GFP

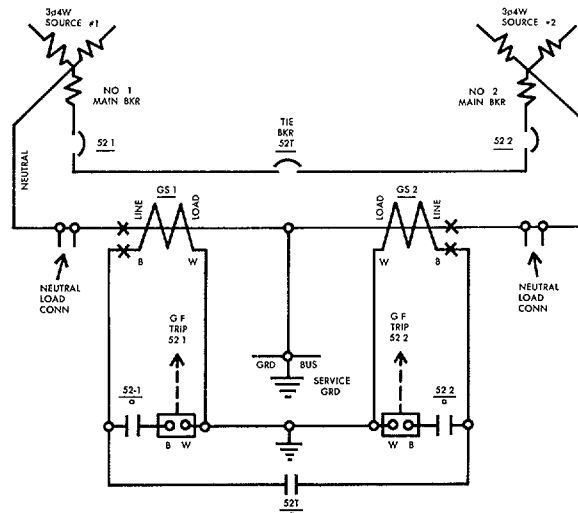
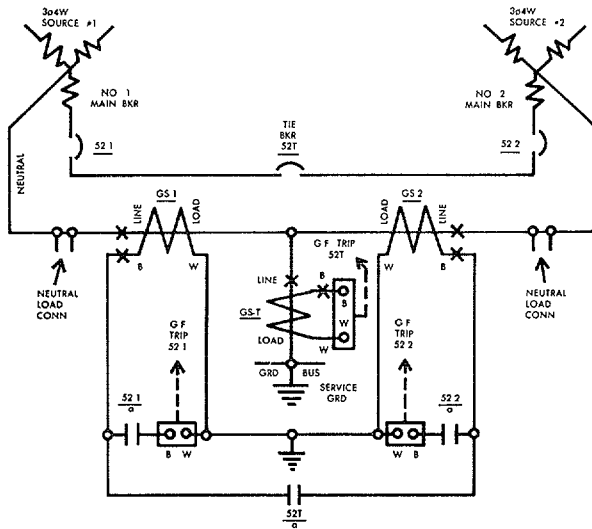


Figure 3 - Double-Ended Switchboard with VersaTrip Ground Fault Protection - Mains Only Tripped for GFP

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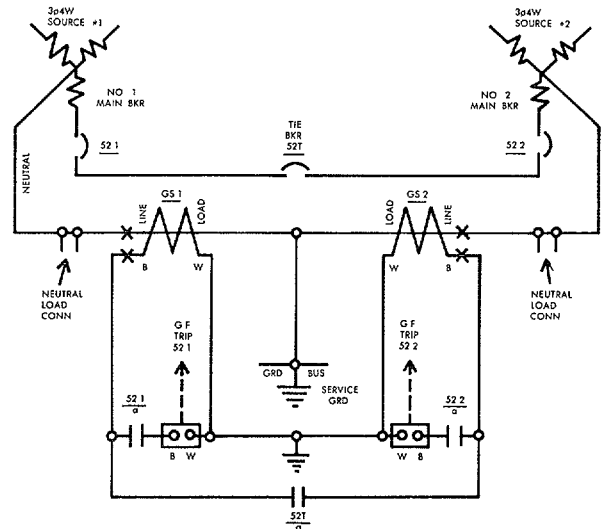


**Figure 2 — Double-Ended Switchboard with VersaTrip Ground Fault Protection — Mains and Tie Tripped for GFP**

When double-ended equipment is subject to operating with all three breakers closed, reliable GFP can be obtained by using a Ground-Break relay to trip the tie, in combination with VersaTrip-GR mains.

### NEUTRAL LOAD CURRENT

In a double-ended switchboard, when one main is open and the tie is closed, neutral load current can flow through the two neutral sensors. The sensor circuitry shown in Fig. 2 & Fig. 3 is arranged to prevent the neutral load current from actuating the ground fault trip units.



**Figure 3 — Double-Ended Switchboard with VersaTrip Ground Fault Protection — Mains Only Tripped for GFP**

### GFP SETTINGS

When mains and tie have VersaTrip-GR ground fault protection, set tie breaker delay time at **MINIMUM**. Set main breaker delay time at **INTERMEDIATE**, in order to obtain selectivity between the mains and tie.

Current pickup settings (trip point) should be determined by system study.

### WIRING

Connect wiring from sensor to breaker black to black and white to white using twisted pair #14 AWG minimum, Belden 8640, 61 or 8470, 71, or equal.

*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.*

CIRCUIT PROTECTIVE DEVICES DEPT. PLAINVILLE, CONN. 06062

