



GFR-2 GROUND FAULT PROTECTION SYSTEM

INSTRUCTION MANUAL

INTRODUCTION

The Class I Ground Fault Protection System is designed to minimize damage to industrial electrical equipment caused by arcing ground currents. GFR-2 works reliably on either high or low resistance grounded distributions systems.

OPERATION

The protection system consists of GFR-2 Ground Relay and a Zero Sequence Current Transformer (Sensor). When the Ground Fault exceeds the current setting, the GFR-2 relay will operate DPDT output contacts. These can be connected to breaker shunt trips, annunciators or other devices. After the fault was cleared, the GFR-2 equipped with mechanically latched relay has to be manually reset before resuming normal operation. Electrically latched version requires the power supply to be turned off in order to reset the relay. Time-delay option has a definite time-current characteristic (see Fig.1)

INSTALLATION

GFR-2 relay is housed in a standard track mount DIN enclosure. The mounting should also allow an easy access to the terminals and to the trip setting potentiometer, located on the side of the relay. The SENSOR should be mounted to allow all phase conductors (and a neutral conductor, if used) to be wired through the SENSOR window. *The wiring from Sensor to GFR-2 relay shall be 600V AWG 14 or as required by Electrical Code. Extra care shall be taken to keep these conductors at least 10 cm (~4 inches) from the power conductors or from other control wiring. The conductors shall be twisted pair. If the distance from the Sensor to GFR-2 exceeds 1.5 meters (5 feet), the twisted pair shall be shielded and grounded at the GFR-2 end.*

CONNECTION

Typical connection diagrams are shown in Fig. 2, 3 and 4.

CALIBRATION

The GFR-2 can operate with any Sensor, recommended by Skymatic Controls. The trip range and the sensor for which the relay was calibrated are shown on the label. The final calibration will be done in following sequence (See Fig. 5). 1. Turn the potentiometer clockwise. 2. Set the calibration current. 3. Turn the potentiometer counter clockwise until the relay trips.

TESTING

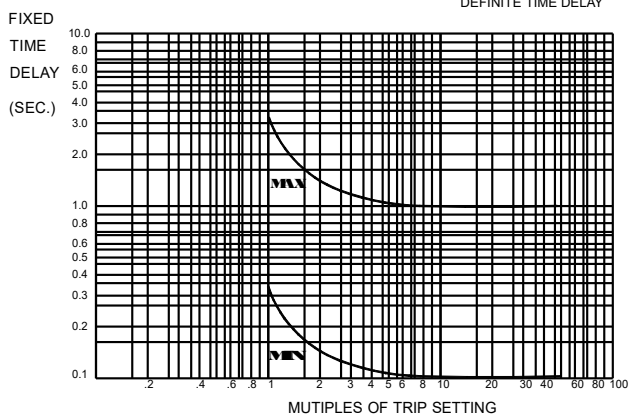
The typical test circuit is shown in Fig. 6.

WARNING

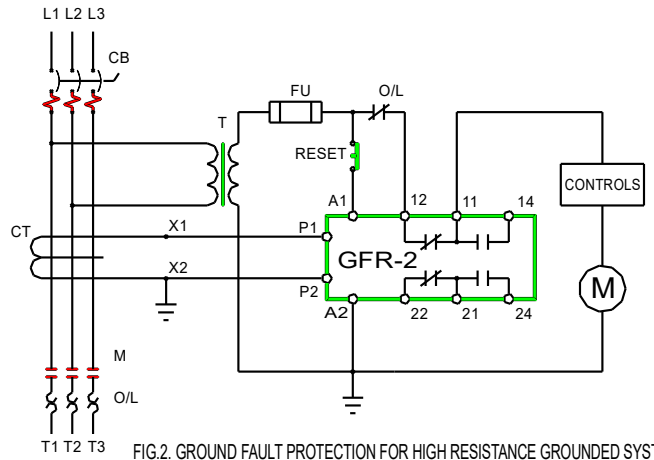
MORE THAN ONE LIVE CIRCUIT MAY BE PRESENT AT THE TERMINALS. DISCONNECT ALL POWER SOURCES BEFORE SERVICING THE RELAY.



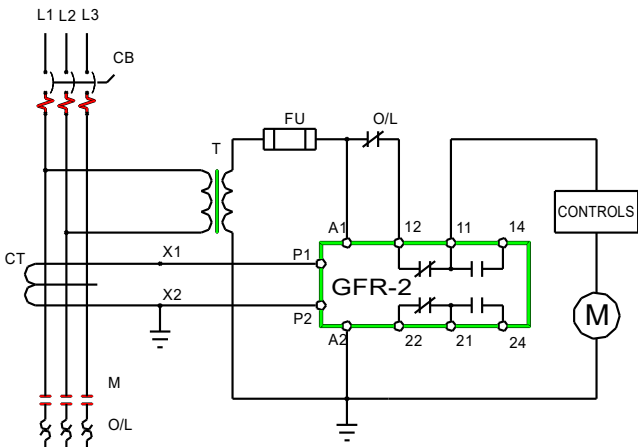
SKYMATIC CONTROLS INC.



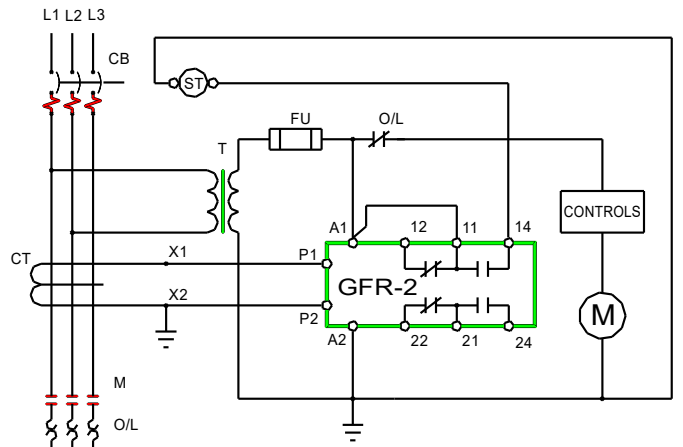
**FIG. 1. GFR-2 GROUND FAULT RELAY
TIME-CURRENT CHARACTERISTICS**
Applicable to time-delay option only



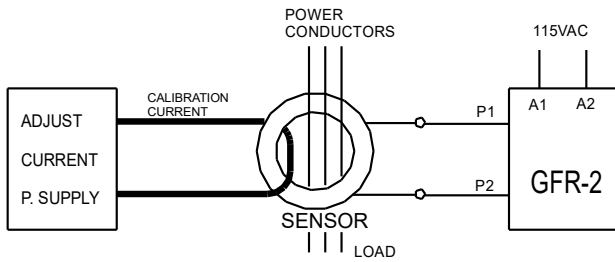
**FIG. 2. GROUND FAULT PROTECTION FOR HIGH RESISTANCE GROUNDED SYSTEM
ELECTRICALLY LATCHED OPTION - TYPICAL CONNECTION DIAGRAM**



**FIG. 3. GROUND FAULT PROTECTION FOR HIGH RESISTANCE GROUNDED SYSTEM
MECHANICALLY LATCHED OPTIONS - TYPICAL CONNECTION DIAGRAM**



**FIG. 4. GROUND FAULT PROTECTION FOR LOW RESISTANCE GROUNDED SYSTEM
MECHANICALLY LATCHED OPTIONS - TYPICAL CONNECTION DIAGRAM**



**NOTE: DISCONNECT LOAD POWER
BEFORE CALIBRATING THE RELAY**

FIG. 5. TRIP SETTING

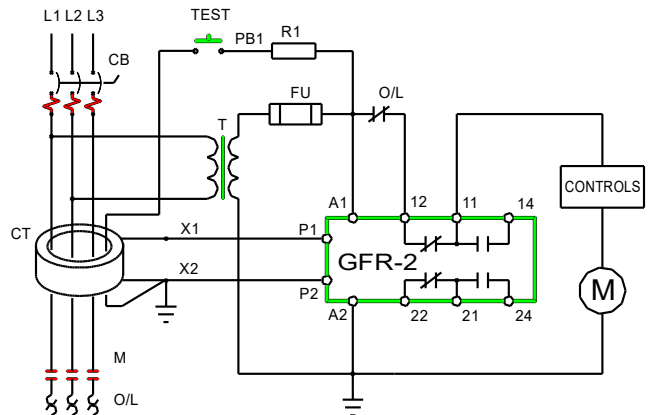


FIG. 6. TYPICAL TEST CIRCUIT FOR GFR-2 RELAY