Gould I-T-E
Ground Fault Relay Systems

I-T-E Protective Relays

Features

- **Fast, sensitive protection**
- **Adjustable pickup and time delay**
- **Wide choice of current sensors**
- **Seismic capability to 6g ZPA**
- **Optional test panel**

Type GRC
Ground Fault Relay Systems
(Surface Case Style Relay)

Application

The GRC Ground Fault Relay Systems offer fast, sensitive protection against ground-faults including destructive, low-magnitude, arcing ground-faults in solid and resistance grounded distribution systems. They consist of a special design, core-balancing current transformer (sensor) and a low-burden, solid-state ground relay.

The ground sensors are available with small or large-window configurations designed to enclose all phase and neutral bus or cable conductors. These sensors will respond only to ground-fault currents. Balanced or unbalanced load currents, two-phase or three-phase short circuits not involving a ground return conductor, will have no effect on the sensor. Two standard pickup ranges are available, one with 5 ampere minimum sensitivity, and one with 100 ampere minimum sensitivity. The 5A system with 5-60A pickup adjustment is used for protection of individual loads such as motors and transformers. On high-resistance grounded systems the 5-60A relay is used for both circuit and load protection. The 100 ampere system with 100-1200A pickup adjustment is used for circuit protection.

The relay provides six time-current curves of definite time shape, figure 3. All relay calibrations are in primary amperes. Tripping of the desired breaker (coordination) is obtained by applying relays with successively faster curves progressing from source to load circuits.

Application of these systems is simple and direct. One sensor and one relay are used with any type of circuits. The sensor is selected by physical size; the relay by sensitivity range and speed of operation. A minimum pickup setting of the relay offers maximum system protection but at a possible sacrifice in selectivity depending on the downstream equipment characteristics. The application does not require special insulated enclosure construction or other similar complexities.

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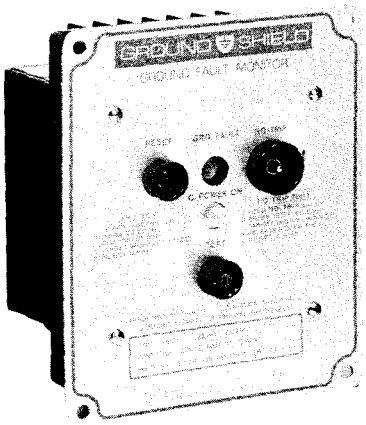
Type TMC
Test and Monitor Panel (Optional)



Features

- **Ground fault indicator**
- **Control power lamp**
- **Tests GRC relay**
- **Optional alarm contacts**

Application

The type TMC Test and Monitor Panel is an optional, flush mounted unit for use with the type GRC Ground Fault Relay System. Standard features include: 1) A CONTROL POWER LAMP to indicate the presence of control power to the relay system. 2) A ground fault OPERATION INDICATOR which maintains indication even on loss of control power. 3) A TEST pushbutton for performing an operational test on the GRC ground relay. 4) A NO-TRIP switch to prevent the disconnect from tripping when the operational test is performed, if continuity of service must be maintained. 5) A RESET pushbutton to reset the target from orange to black.

An auxiliary output relay can be provided as an option for remote alarm or other purposes. Its contacts are reset after a relay operation by the RESET pushbutton.

Typical Wiring Diagrams

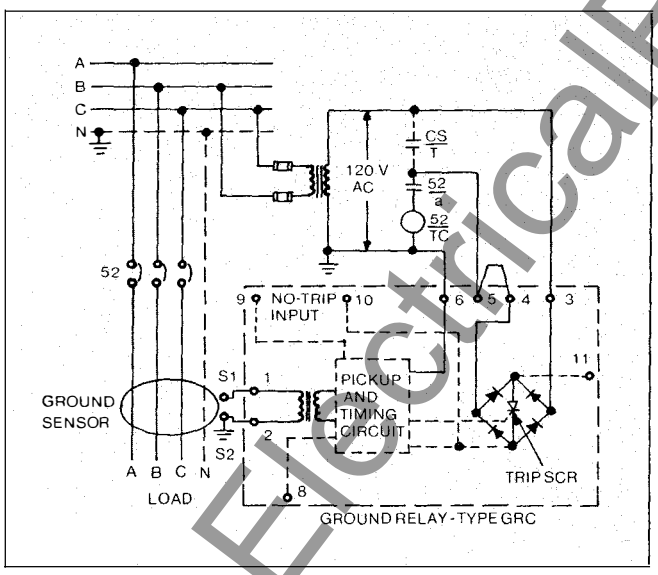


Figure 1a: Type GRC Relay Without Monitor Unit

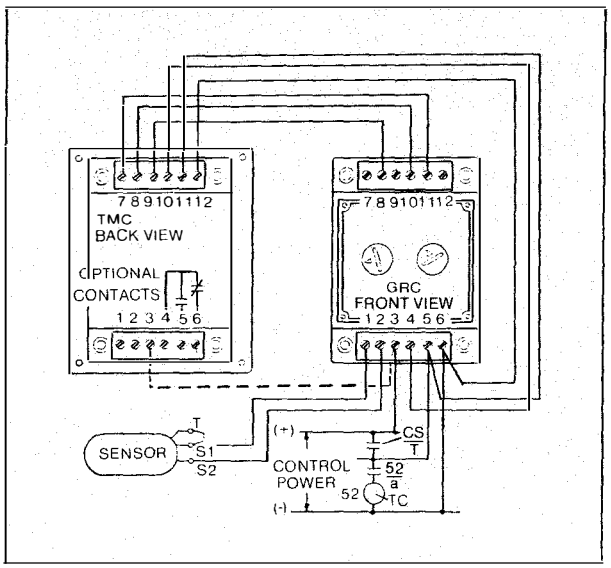


Figure 1b: Type GRC Relay With TMC Monitor Unit

Notes:

1. System "neutral to ground" connection must be on source side of ground sensor. DO NOT ground neutral anywhere downstream from sensor location.
2. Control power source should have sufficient capacity to accommodate trip coil inrush current and to avoid excessive voltage collapse during operation. Relay and monitor standby drain is negligible.
3. Special precautions must be taken when applying ground fault relaying on 4 wire dual service or double ended substations. Refer to factory for additional information.
4. On sensors provided with the T terminal, a shorting link is required between Terminals T and S1.
5. Connection shown dotted in Figure 1b must be made when alarm contacts are provided.

Specifications - Type GRC

Sensitivity: Adjustable, models for
5-60A. 50/60 Hz.
100-1200A. 50/60 Hz.
(for 2-24A, refer to factory)

Operating Time: Adjustable. See figure 3.

Momentary Withstand:

	5A relay	100A relay
2 cycles	80000A	100000A
0.5 sec	60000A	65000A
continuous	300A	3000A

Output Ratings:
Thyristor (SCR) 30 ampere rms for 2 cycles
7.5 amperes rms for 1 second
1 ampere continuous (DC models)
0 ampere continuous (AC models)

Control Power: Models available for 120 Vac, 125 Vdc, 48 Vdc, 32 Vdc, 24 Vdc (for other voltages, refer to factory)

Operating Temperature: Minus 20 to plus 75 C

Seismic Capacility: More than 6g ZPA in any axis, without damage or malfunction.

Transient Immunity: More than 3000V, 1 MHz bursts, at 60 Hz repetition rate, continuous.

Specifications - Type TMC

Control Power: Must have same nominal control voltage rating as its associated GRC relay. Models available for 120 Vac, 125 Vdc, at 0.015A max. Consult factory for other voltages.

Contact Rating: for optional auxiliary relay, at 125 Vdc.
30 amps RMS for 0.033 sec.
5 amps RMS continuous
1 amp break (resistive)
0.3 amp break (inductive)

Additional Information

Relay selection list with prices	18.1.5
Instruction Book - Type GRC	18.1.7-8
Instruction Book - Type TMC	18.1.7-9
Dimensions	18.1.2

To place an order or for further information, contact your nearest Gould Electrical Systems Group or Electrical Products Group Sales Office, or Sales Manager Horsham Operation.

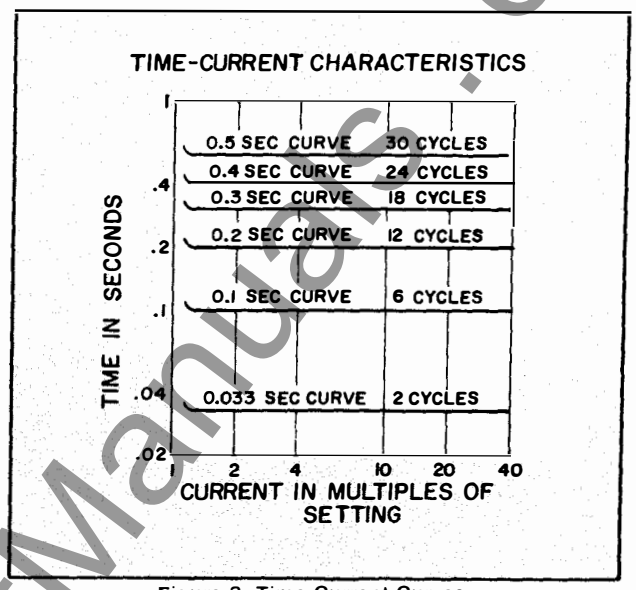


Figure 3: Time Current Curves

How To Specify

Ground fault protection shall be ITE type GRC system or approved equal, consisting of (1) type GRC relay and (1) type GS current sensor. Sensitivity and operating time shall be adjustable on the front panel. Relay shall be capable of withstanding up to 6g ZPA seismic stress without damage or malfunction at minimum settings.

Optional: ITE Type TMC Test and Monitor Panel or approved equal shall be provided to perform the following functions: control power indication, built-in means of testing the ground relay with or without tripping the disconnect device, operation indicator which retains indication on loss of control power.

How To Order

For each circuit to be protected order (1) type GRC relay and (1) type GS current sensor. Select 5-60A relay for single motors, transformers, and high-resistance grounded systems. Select 100-1200A relay for main, tie, feeder, and branch circuits. Also select the relay based on the control voltage source. Select the optional TMC monitor panel by the control voltage source.

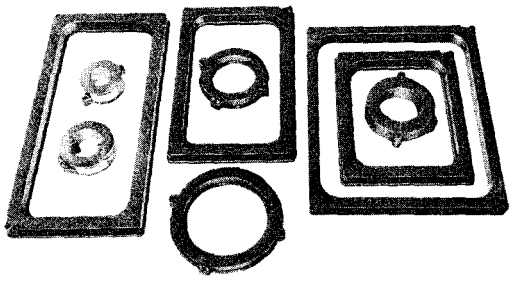
Select a type GS current sensor from the tables on the next page. Select a size which will encircle all phase conductors (including the neutral on a 4 wire system). Select a solid core or split core type. Split core sensors allow easier installation of ground fault protection to existing systems, since disconnecting bus work or cables is not necessary.

See price bulletin 18.1.5 for latest listing of available relays, monitor panels, and sensors. Consult factory for units with control voltage or sensitivity other than those listed.

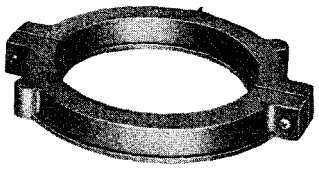
Type GRC Ground Fault Relay Systems (Surface Case Style Relay)

Type GS Ground Sensors

The current sensor consists of a wound core of small cross section with a uniformly distributed secondary winding. Solid core units have the entire assembly cost in epoxy. Split core units are separable for easy installation over existing cables or bus.



Type GS Ground Sensors-Round and Rectangular



Type GS Ground Sensor - 8" Split Core

UL — Listed by Underwriters' Laboratories, Inc.

Solid Core

Size & Shape	Catalog Numbers	
	Use with 5-60A Relay	Use with 100-1200A Relay
2" Round	302B0200UL	302B0200UL
3" Round	302B0300UL	302B0300UL
5" Round	302A0500UL	302B0500UL
8" Round	302A0800UL	302B0800UL
7" x 21" Rectangular	302L0721UL	302L0721UL
7" x 25" Rectangular	302L0725UL	302L0725UL
7" x 27" Rectangular	302L0727UL	302L0727UL
7" x 31" Rectangular	302L0731UL	302L0731UL
7" x 37" Rectangular	302L0737UL	302L0737UL
10" x 13" Rectangular	302B1013UL	302B1013UL
10" x 17" Rectangular	302B1017UL	302B1017UL
10" x 24" Rectangular	302B1024UL	302B1024UL
16" x 20" Rectangular	—	302B1620UL

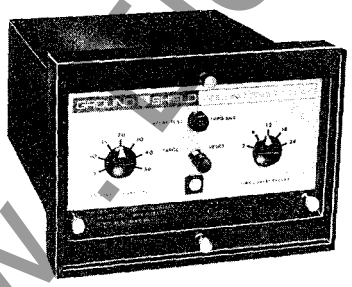
Split Core

Size & Shape	Catalog Numbers	
	Use with 5-60A Relay	Use with 100-1200A Relay
8" Round	302D0800UL	302D0800UL
7" x 17" Rectangular	302T0717UL	302T0717UL
7" x 24" Rectangular	302T0724UL	302T0724UL
7" x 27" Rectangular	302T0727UL	302T0727UL
7" x 30" Rectangular	302T0730UL	302T0730UL
7" x 37" Rectangular	302T0737UL	302T0737UL
10" x 10" Rectangular	302T1010UL	302T1010UL
10" x 17" Rectangular	302T1017UL	302T1017UL
10" x 24" Rectangular	302T1024UL	302T1024UL
10" x 30" Rectangular	302T1030UL	302T1030UL

Notes:

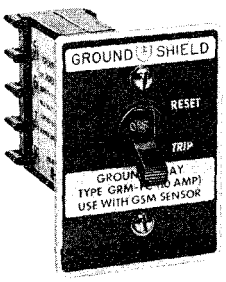
1. Sensors are 600V class devices. Follow air and surface clearance requirements of electrical equipment designs.
2. For sensor dimensions see handbook sheets 18.1.2 pages 1-3.
3. Cable spacers are supplied with 5 and 8 inch round sensors.

These Ground Fault Relays are Also Available



Types GR-5, GR-200 Drawout Case Relay

See Bulletin 18.1-1



Type GRM Relay System

See Bulletin 18.1-8

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