Ground-Censor®

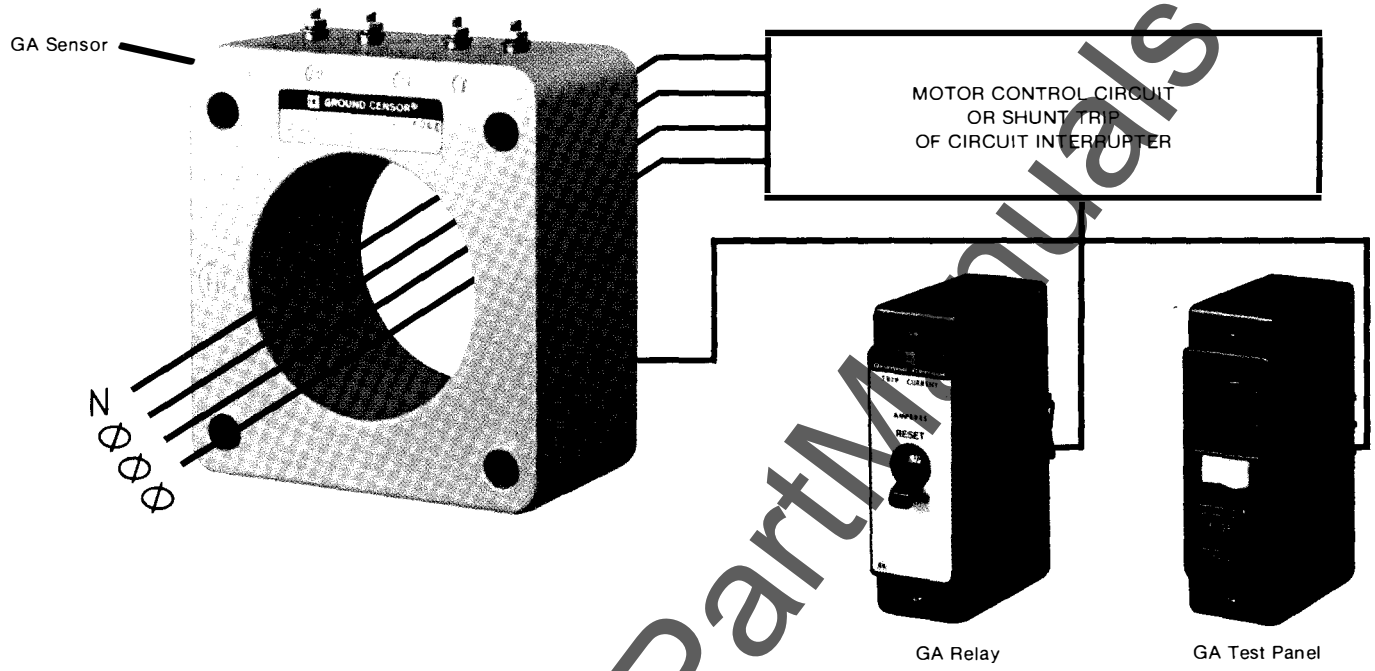
Ground Fault Protection Systems for Electrical Equipment

SQUARE D COMPANY

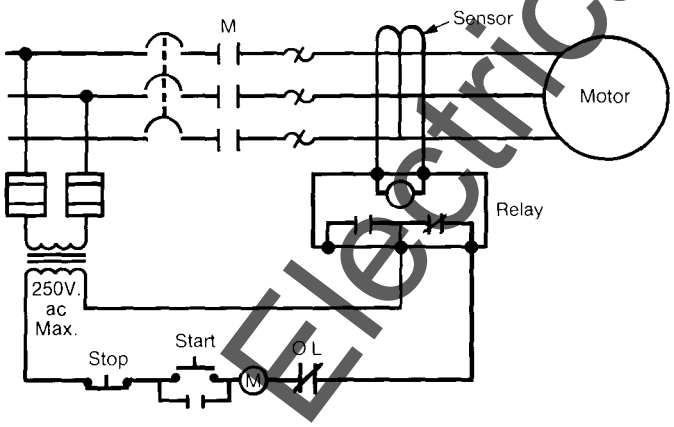
Type GA System

designed for low level protection of equipment.

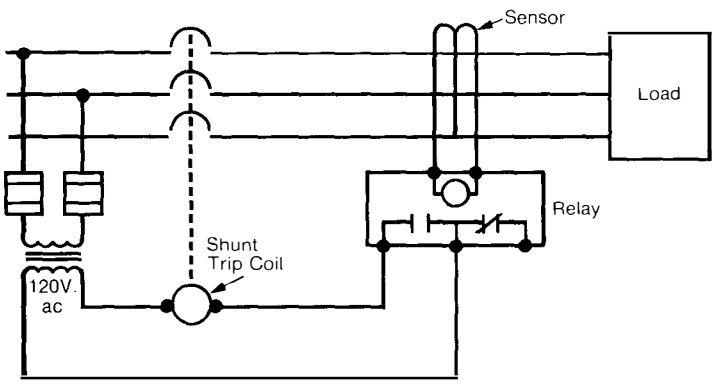
Compact design and a trip level as low as four amperes of ground fault current makes the GA system specifically suited for motor protection. It is rated 600 volts ac and designed for use on distribution systems having up to 100,000 RMS amperes available fault current.



USING MOTOR STARTER



USING MOLDED CASE CIRCUIT BREAKER
WITH STANDARD SHUNT TRIP



Sensors

- Available for current pick-up ranges from 4 to 1200 amperes.
- Removable leg on larger units to facilitate installation in existing equipment.
- Test winding included on most units.

Relays

- Current pick-up field adjustable over the sensor pick-up range.
- Available in either factory set (1.5 cycles) or field adjustable time delay (1.5 to 36 cycles) models.
- Output of the relays, one normally open/normally closed set of contacts rated 10 amperes, 250 volts ac.
- Activation of the ground fault system indicated by movement of the handle to the TRIPPED position.

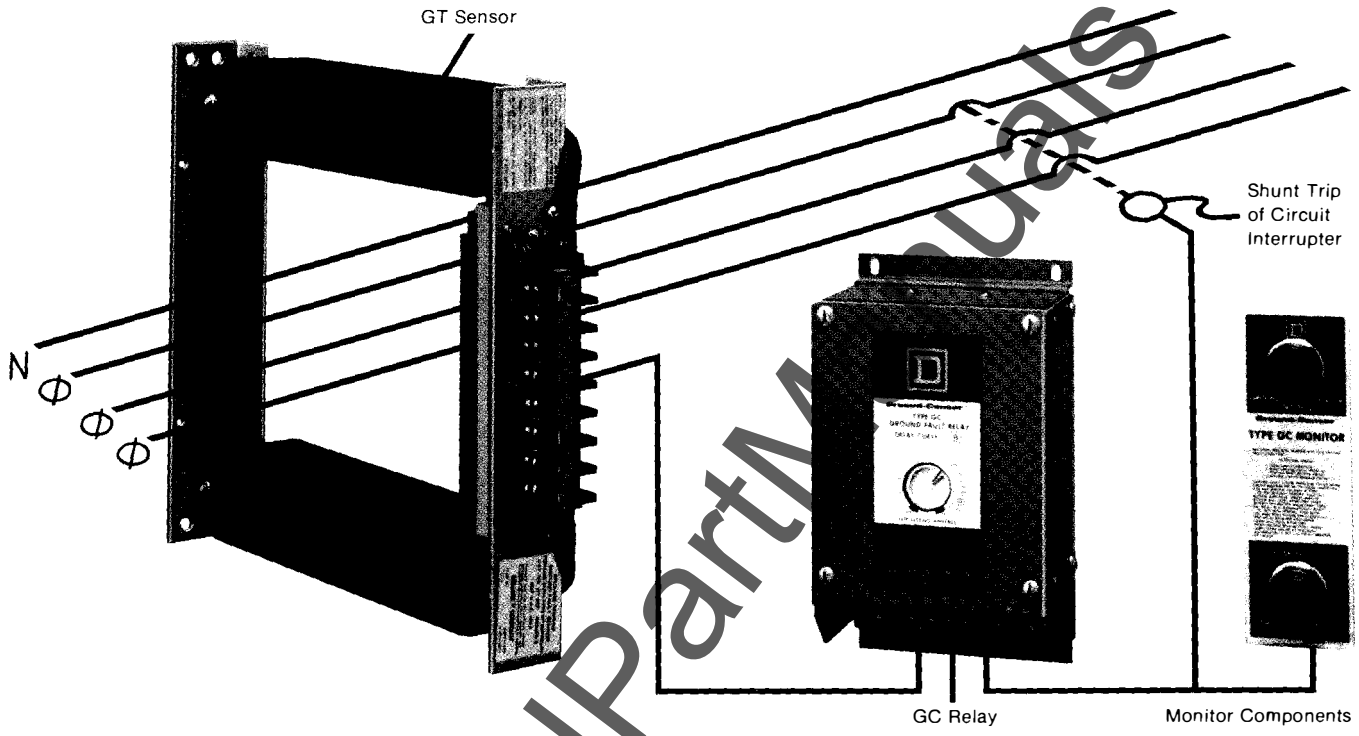
Test Panel

- Push button for operation of system test circuit.
- By-pass permits testing of the GA system without interrupting the operation of the load.
- 120 volt ac powered.

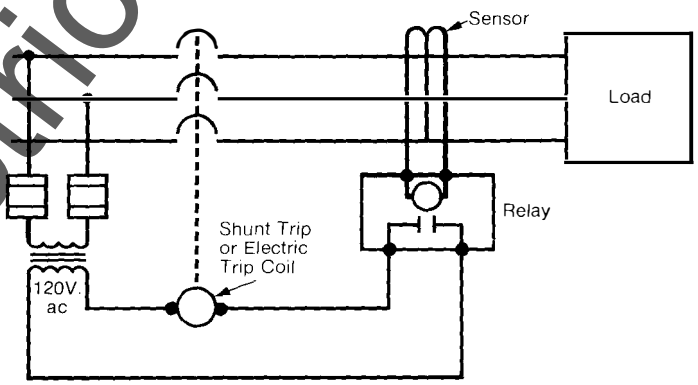
Type GC System

for zone selective interlocking.

A ground fault on any segment of the electrical system will be handled instantaneously (0.03 seconds) by the GC relay nearest the fault. All upstream GC relays will be restrained in a time delay mode for back-up protection. The GC system is rated 600 volts ac and is designed for use on distribution systems with up to 200,000 RMS amperes available fault current.



USING MOLDED CASE CIRCUIT BREAKER WITH STANDARD SHUNT TRIP OR ELECTRIC TRIP BOLTED PRESSURE SWITCH



Sensors

- Available in a variety of sizes to meet individual requirements.
- Removable leg to facilitate installation in existing equipment.
- Test winding included.

Relay

- Pick-up range field adjustable from 100 to 1200 amperes.
- Restrained time delay field adjustable for 0.1, 0.2, 0.3 or 0.5 seconds.
- 120 volt ac powered.

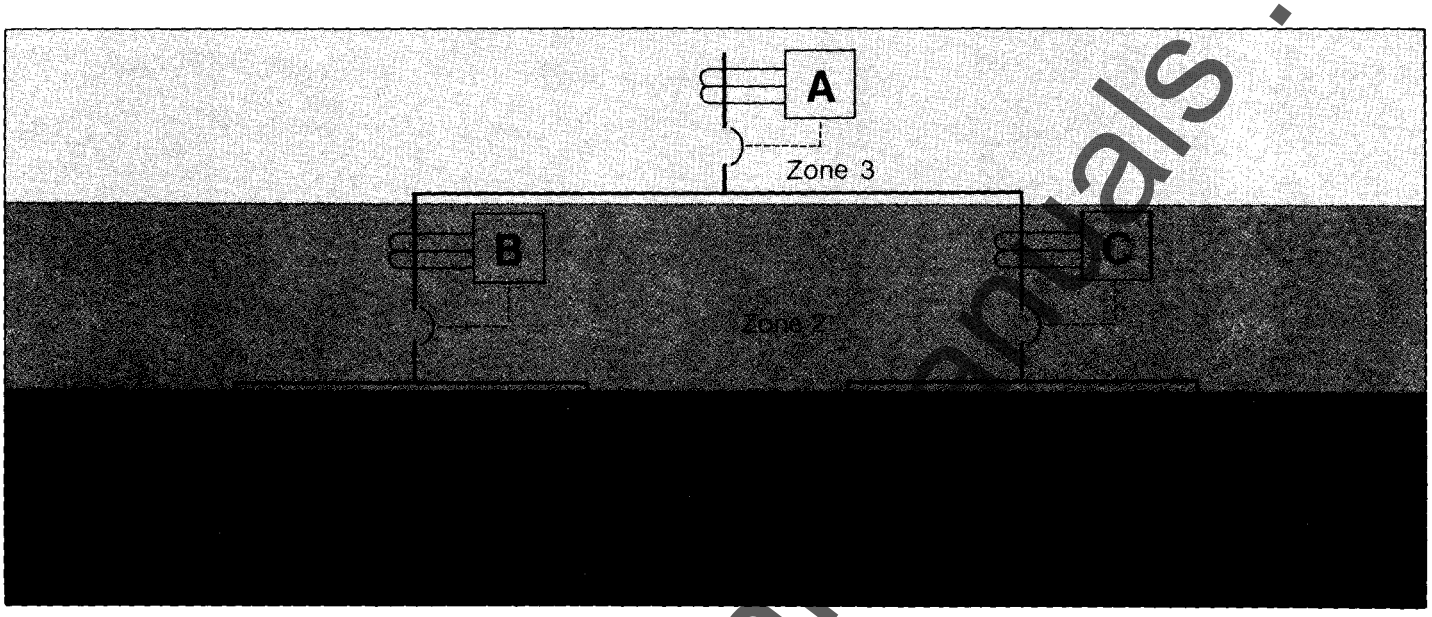
Monitor Test Panels

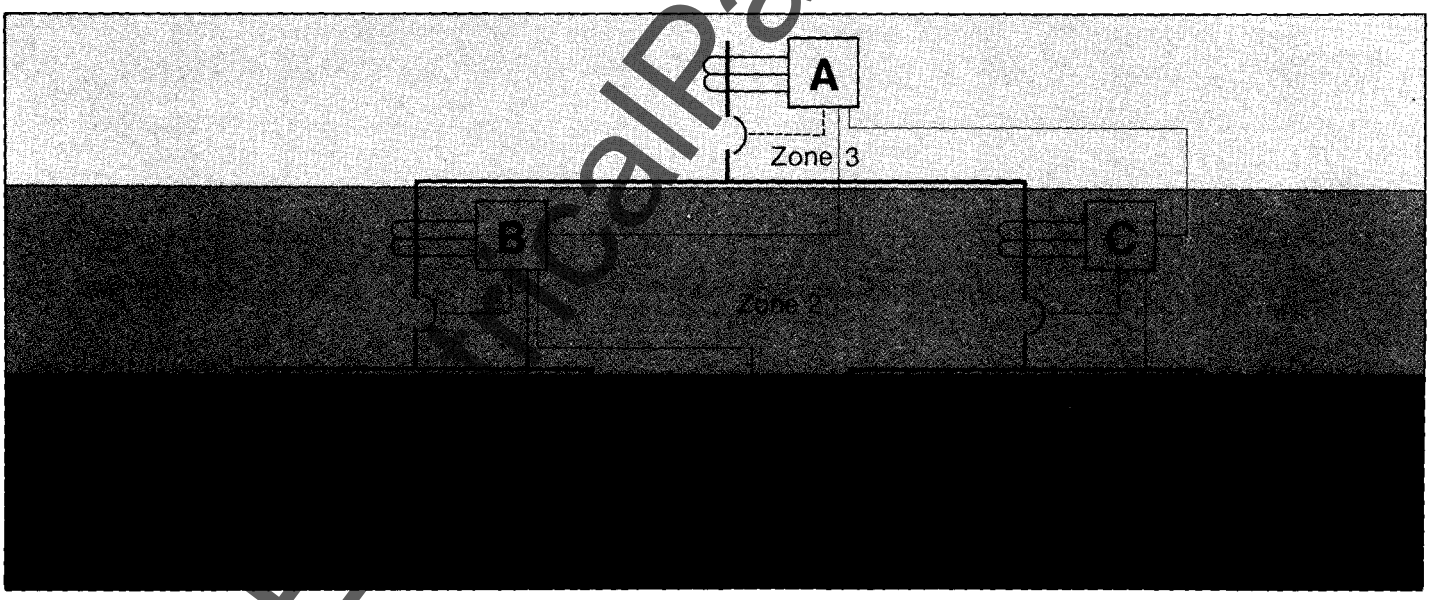
- Red light indicates operation of the ground fault system.
- Available to test with or without tripping the circuit interrupting device and to test with tripping only.
- 120 volt ac powered.

Coordination using Type GA or GP Ground-Censor® System

Both current and time are factors of relay operation. Positive coordination between mains, feeders and branches is necessary to insure that the smallest possible segment of the system is opened in the event of a ground fault.

All GA or GP relays in the diagram below would have time delay. Relay F and its associated circuit interrupting device would clear the fault because Relay F would have a shorter time delay than Relay C. Relay C would operate, after its time delay, as back-up protection only if Relay F failed to clear the fault. Relay C would have a shorter time delay than Relay A. Each relay would operate, after time delay, for a ground fault in its own zone.





Coordination using Type GC Ground-Censor® System

Zone selective interlocking not only allows operation at the minimum desirable time for units in every zone when they are responding to ground faults in their own zone but also establishes positive coordination between mains, feeders and branches so that the smallest possible segment of the system is opened in the event of a ground fault.

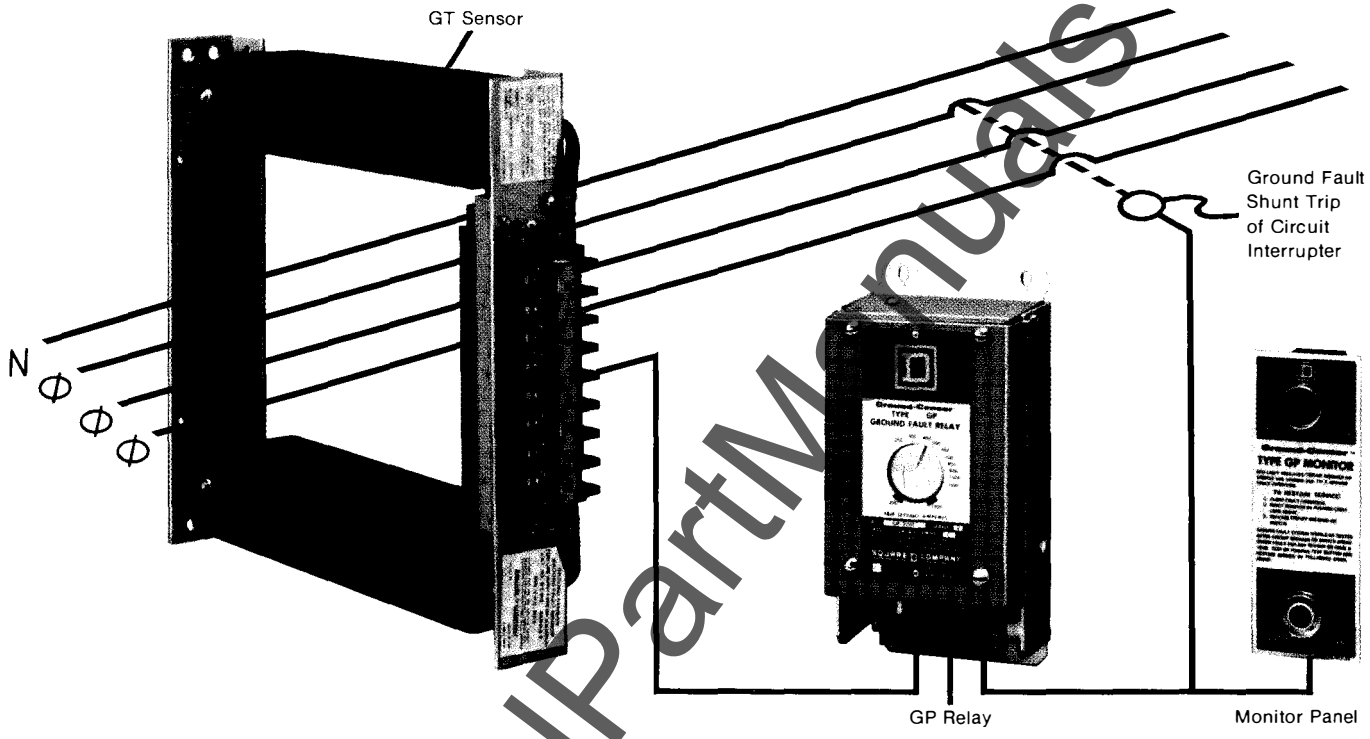
All GC relays in the diagram above would operate in 0.03 seconds in response to a ground fault in their own zone. Upstream relays would be restrained to a time delay (up to 0.5 seconds) in response to ground faults outside of their own zone. Relay A would be set to a longer restrained time delay than Relay B and C. Operation of Relay F would send a signal to Relay C and A, restraining them to a time delay while Relay F (and its associated circuit interrupting device) cleared the fault. Relay C would operate after time delay as back-up protection only if Relay F failed to clear the fault.

Up to 20 relays may be interconnected in this way, provided that not over six can simultaneously provide an input signal to any one upstream relay.

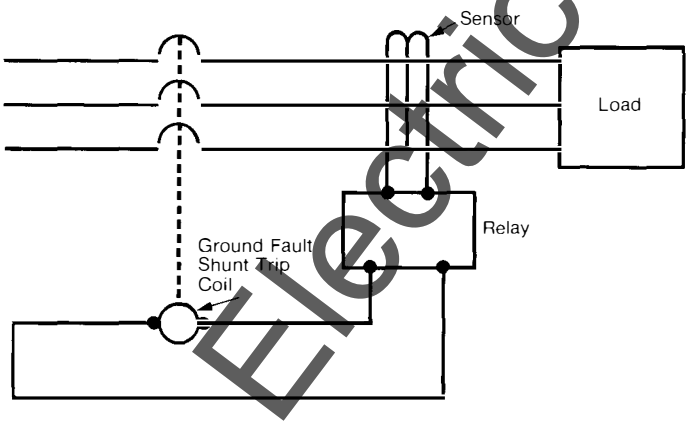
Type GP System

self-powered, for operating molded case circuit breakers.

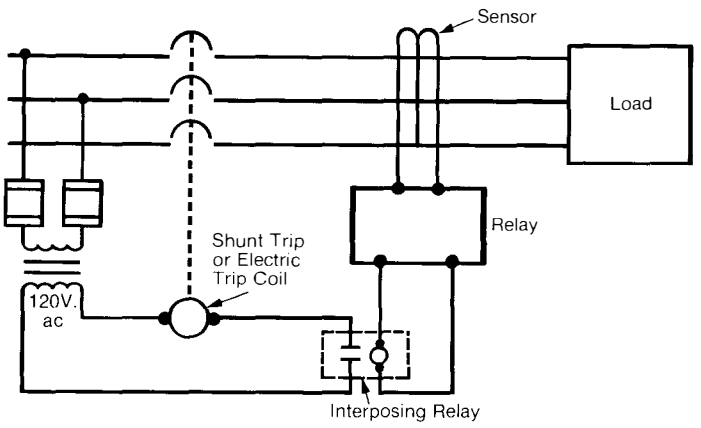
This system is completely self-powered, with all the energy required to power the relay and operate Square D molded case circuit breakers (with ground fault shunt trip) derived directly from the output of the sensor. The GP system is rated 600 volts ac and is designed for use on distribution systems having up to 125,000 RMS amperes available fault current.



USING SQUARE D MOLDED CASE CIRCUIT BREAKER WITH GROUND FAULT SHUNT TRIP



USING MOLDED CASE CIRCUIT BREAKER WITH STANDARD SHUNT TRIP OR ELECTRIC TRIP BOLTED PRESSURE SWITCH



Sensors

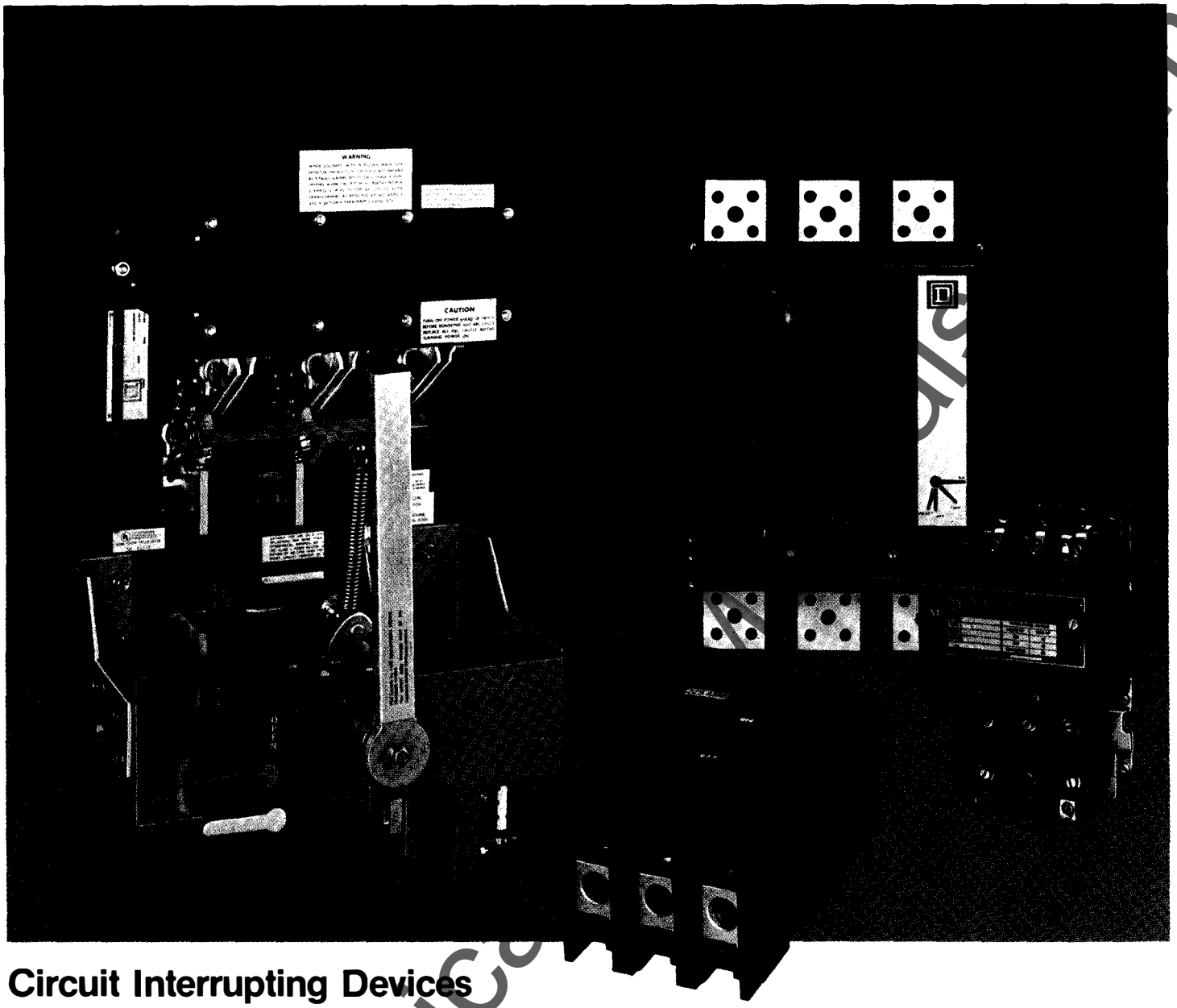
- Available in a variety of sizes to meet individual requirements.
- Removable leg to facilitate installation in existing equipment.
- Test winding included.

Relays

- Pick-up range field adjustable from 200 to 1200 amperes.
- Available in factory set time delays of 0.1, 0.2, 0.3 and 0.5 seconds.
- Used with an interposing relay and 120 volt ac power for bolted pressure switch applications.

Monitor Test Panel

- Red light indicates operation of the ground fault system.
- Push button for operation of system test circuit.
- 120 volt ac powered.



Circuit Interrupting Devices

The output contacts on the GA relay can be used to "drop-out" the motor starter on motor control applications or to operate the standard shunt trip circuit of a molded case circuit breaker.

The output of the GP relay is used to trip any Square D molded case circuit breaker incorporating a ground fault shunt trip without external or control power. The GP relay output can also be used to energize an interposing relay which, in turn, will operate the standard shunt trip circuit of any molded case circuit breaker or the electric trip circuit of a bolted pressure switch.

The GC relay output contacts are used to operate the standard shunt trip circuit of any molded case circuit breaker or the electric trip circuit of a bolted pressure switch.

SQUARE D COMPANY