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pages 1-2, dated September 1990
Mailed to: E, D, C/41-300B

Device Number: 87

GROUND SHIELD® Type GRD Machine Differential Relay System



GRD differential protection systems provide fast, sensitive protection against phase-to-ground, phase-to-phase, and three phase faults internal to AC machines. The system consists of three toroidal current sensors and one three phase differential relay.

These self-balancing differential relays are used to supplement overcurrent relays which provide overload and locked rotor protection. The GRD relay can be set to detect faults as low as 2 amps primary, preventing the burning of iron laminations, thereby greatly reducing the time and cost of repair since restacking the core would not be necessary.

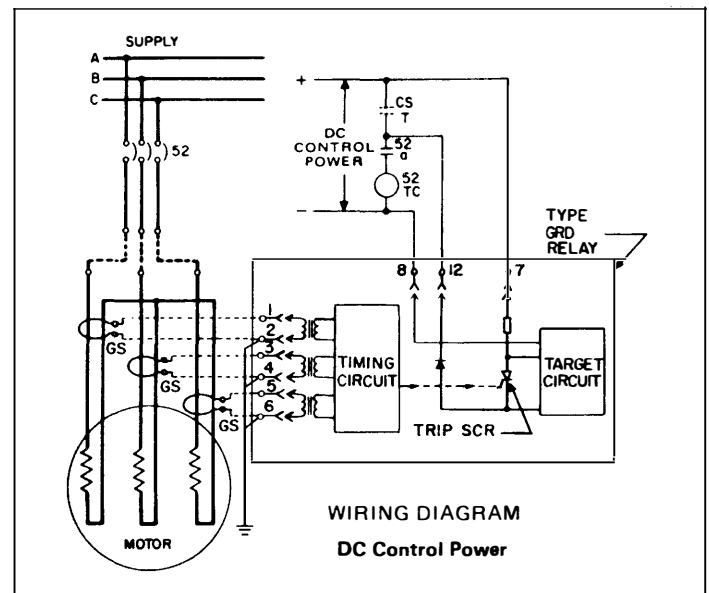
While more sensitive than percentage differential relay schemes, the GRD system is less costly, allowing its use on smaller machines where the cost of other schemes would be prohibitive.

Since the same current sensor is used to detect the difference between current into and out of each winding, problems of current transformer saturation are avoided. The relay may be located remote from the machine and sensors without the usual concern for the saturation characteristics of current transformers or for lead drop.

Adjustments for pickup sensitivity and time delay are provided to allow optimum settings for each application.

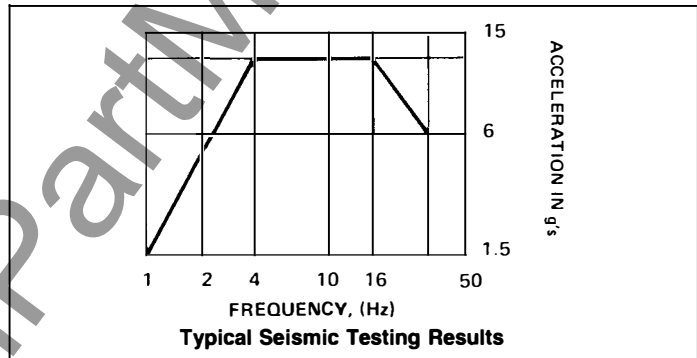
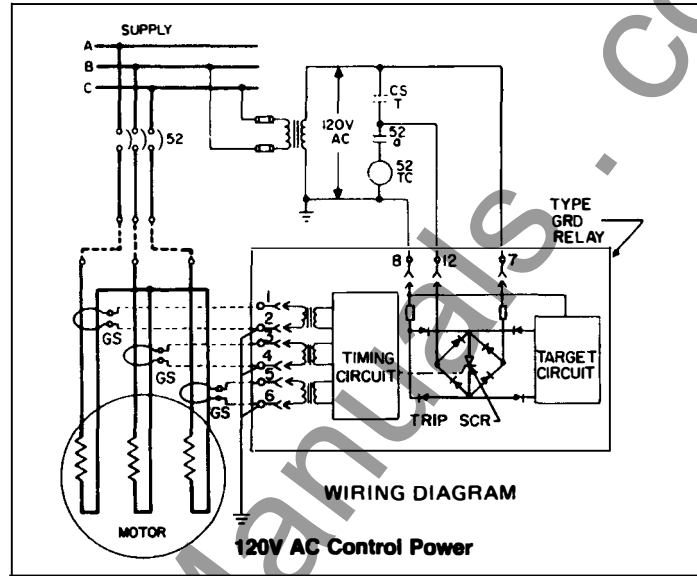
Features

- Fast, sensitive protection
- Adjustable pickup and time delay
- Small sensors, easily mounted
- Seismic capability to 6g ZPA
- Built-in test
- Transient immunity
- Drawout construction
- 2 year warranty



Specifications

Differential Sensitivity: (Primary amperes)	Adjustable 2, 5, 10 Amps, 50/60 Hz
Differential Withstand Ratings: (Primary amperes)	100 kA, .033 sec. 65 kA, .5 sec. 300A, continuous
Continuous Phase Current Rating:	Limited only by primary bus (cable)
Operating Time	Adjustable 1, 3, 5 cycles (60 Hz basis)
Control Power:	Models for: 24Vdc 48Vdc 250Vdc 125Vdc 120Vac (.03A drain at all voltages)
Output Rating:	30A, 0.10 sec. 12A, 0.25 sec. 7.5A, 1 sec. 1A continuous
Operating Temperature:	Minus 20° to plus 70°C
Seismic Capability:	More than 6g ZPA biaxial broadband multifrequency vibration without damage or malfunction (ANSI/IEEE C37.98)
Transient Immunity:	More than 2500 V, 1 MHz bursts at 400 Hz repetition rate, continuous (ANSI C37.90a SWC); Fast Transient Test; EMI Test.
Weight:	Unboxed — 3.3 lbs (1.5 Kg) Boxed — 4.0 lbs (1.8 Kg) Volume — 0.26 cubic feet



How To Specify

Phase and ground fault protection shall be Asea Brown Boveri Type GRD system or approved equal, consisting of (1) Type GRD relay and (3) Type GS current sensors. Differential sensitivity shall be adjustable 2-10 amperes (primary) and operating time adjustable 1-5 cycles. Relay shall be capable of withstanding up to 6g ZPA seismic stress without damage or malfunction at minimum settings. Built-in means shall be provided to allow operational tests without additional equipment. Sensors shall be of small cross section to facilitate mounting at the machine terminals.

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

How To Order

For each 3 phase machine to be protected order (1) type GRD relay and (3) type GS current sensors. Select the relay based on the listings on page 3.

For each sensor, select the inside diameter required to enclose the 2 cables (each end of a phase winding of the 3 phase machine). Select either solid core or split core construction. For sensor dimensions see Dimension Sheet 41-095.

For the latest listing of sensor prices see PL 41-020.

Further Information

List Prices: PL 41-020
 Technical Data: TD 41-025
 Dimension Sheet: 41-095
 Instruction Book: IB 7.1.1.7-4
 Motor Protection Relays: 41-205M
 Other Protective Relays:
 Application Selector Guide, TD 41-016

Note: For schemes where conventional 50:5 core balance ct's have already been selected, use a three-phase Type 50D relay (DB 41-112S).

