INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE SGR-1 RECLOSING RELAY — HAND RESET

CAUTION Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, inspect the contacts to see that they are clean and close properly, and operate the relay to check the settings and electrical connections.

This relay should be reset before replacing the cover.

APPLICATION

The type SGR-1 reclosing relay is designed to provide one immediate automatic reclosure of an electrically-operated circuit breaker in an attended substation. Because a large percentage of faults are of a transient nature, it has been found that immediate reclosure of a breaker is usually successful and avoids service interruption to customers if the protective devices for this equipment are provided with a slight time delay.

The type SGR-1 reclosing relay consists of a mechanically-latched contactor suitable for switchboard panel mounting. It must be reset manually, and therefore is applicable for use only in attended substations.

CONSTRUCTION AND OPERATION

The type SGR-1 reclosing relay is similar in appearance to the type SG auxiliary relay. It has been modified by the addition of a mechanical latch to hold the armature in its energized position after the coil has been de-energized, and by the provision of means extending through the cover by which the latch can be lifted manually to allow the armature to reset. The operating element consists of a core, coil, yoke, and armature. The core for the A-C type has a copper shading loop assembled in its pole face, and a thin bronze washer is assembled between the core and the yoke to prevent the armature from sticking in the closed position due to residual magnetism. The core for the D-C type has no shading loop and there is no washer between core and yoke, but a bronze pin in the pole face serves as an anti-residual spacer.

The armature assembly carries the two moving contacts and a metal tongue or arm which engages the hinged latch arm, mounted on the upper side of the yoke, to hold the armature in the energized position. The two stationary contacts can be assembled as either "make" or "break" contacts. However the relay is shipped with the contacts assembled one "make" and one "break", because in the reclosing circuit one contact must be a "break" contact and the other is ordinarily used as a "make" contact to energize an alarm.

The external schematic diagrams show the electrical connections for using the type SGR-1 reclosing relay in both A-C and D-C breaker control circuits. These diagrams show the conditions previous to the initial closing of the breaker by means of the control switch and with the breaker deenergized and unlatched.

When the control switch is closed, the normal functioning of the control relays closes the breaker. Any subsequent automatic opening of the circuit breaker will start the reclosing cycle immediately upon the latching of the breaker operating mechanism. It will be seen that this is accomplished by the circuit consisting of the 79 back contact, the breaker mechanism switch contact 52bb, the 52 X coil, the 52 Y back contact and the breaker latch checking switch contact 52LC. This circuit is completed as soon as the breaker has fully opened and is ready to respond to energization of the closing coil. Contacts of the control relay 52 X close the circuit to the closing coil 52C and to the reclosing relay coil 79. In the closed position of the type SGR-1 reclosing relay, the back contact is opened preventing any subsequent reclosure and the front contact may be used to make connection to an alarm if this is desired. It is necessary to reset the reclosing relay before any further automatic action can be obtained. However, if the breaker fails to stay in on this first reclosure it can be closed again manually through

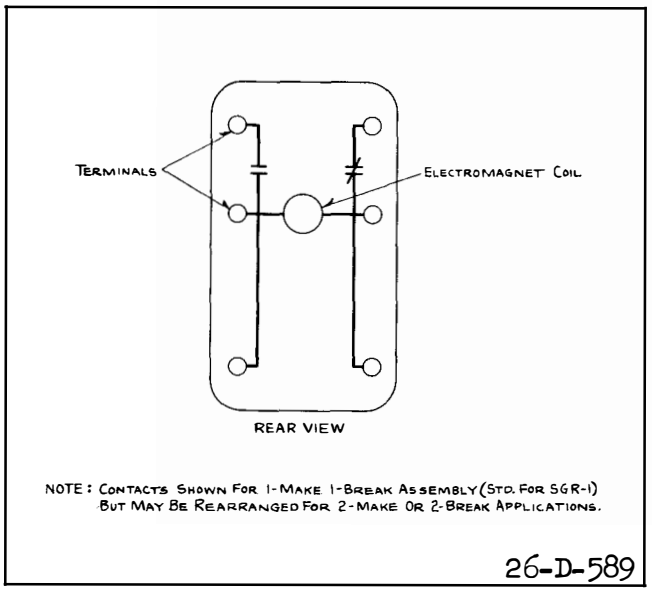


Fig. 1. Internal Schematic of the Type SGR-1 Reclosing Relay in the Molded Case.

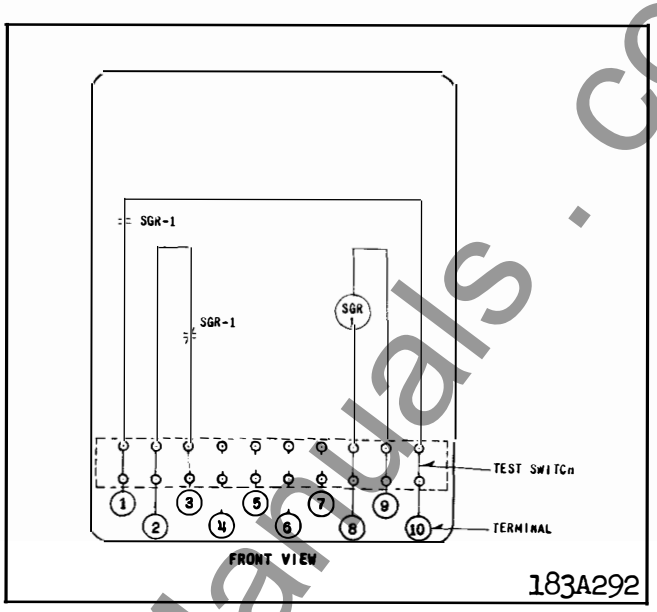


Fig. 2. Internal Schematic of the Type SGR-1 Reclosing Relay in the FT11 Case.

control switch contact 101-C. In order to prevent the reclosing of the circuit breaker if it is tripped manually when the reclosing relay is unlatched, the reclosing connection is opened through the use of the control switch slip contact 101-5SC.

In general, it should be noted that for mechanically non-trip-free mechanisms the control relay cutoff must have enough time delay so that the breaker is completely latched before the energy is removed from the closing coil. For mechanically trip-free breakers, particularly under the condition of immediate reclosing, in addition to the above it is necessary to insure that the closing mechanism is securely latched to the breaker operating rod before energy is applied to the closing coil. Otherwise, it is possible for the reclosing relay to energize the closing mechanism without closing the breaker. This can be accomplished most positively through use of a latch-check switch 52 LC.

In applying automatic reclosing equipment it is necessary also to check the protective relays to be sure that their contacts will open within 10 cycles or less after the breaker is tripped in order to assure opening of the trip circuit before the reclosure takes place.

CHARACTERISTICS

The SGR-1 reclosing relay is available in standard ratings of 115 volts 60 cycles, 230 volts 60 cycles, and 125 volts d.c. The relay will operate at 80% of its rated operating value. The contacts will carry 12 amperes continuously or 30 amperes for one minute.

ADJUSTMENTS AND MAINTENANCE

CAUTION Reset the relay before replacing the cover.

The proper adjustments to insure correct operation of this relay have been made at the factory and should not be disturbed after receipt by the customer. If the adjustments have been changed, the relay taken apart for repairs, or if it is desired to check the adjustments at regular maintenance periods, the instructions below should be followed.

The "make" contact follow should be 3/64" at the contact, or slightly more than 1/32" if measured between top of - the molded armature block and the contact finger. If the follow differs appreciably, the stationary contact support may be bent slightly to obtain the specified value. The stationary "break" contact should act as the stop for the armature in its deenergized position, and the tongue on the yoke which projects through the lower end of the armature should not touch the armature at any position of its travel. The stationary "break" contact should be bent (if necessary) so that the "break" contact gap is approximately 11/64" when the armature is in its energized position.

With the armature held firmly against its core and

the latch dropped as far as possible, there should be .005 to .015 inch clearance between the back of the armature latch member and the corner of the latch arm which holds the armature in the latched position. The arm which is rivetted to the armature may be bent slightly if adjustment is found to be necessary.

The latch arm should move freely on its bearing, with only slight side-play. The working surfaces of both the latch arm and the end of the arm rivetted to the armature should be smooth.

All contacts should be cleaned periodically. A contact burnisher S#182A836H01 is recommended for this purpose. The use of abrasive material for cleaning contacts is not recommended, because of the danger of embedding small particles in the face of the soft silver and thus impairing the contact.

RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However, interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts, always give the complete nameplate data.

ENERGY REQUIREMENTS

The volt-ampere burden at rated voltage (60 cycles) is 10, at a power factor of approximately 50%. The watt consumption at rated d.c. voltage is 3.5.

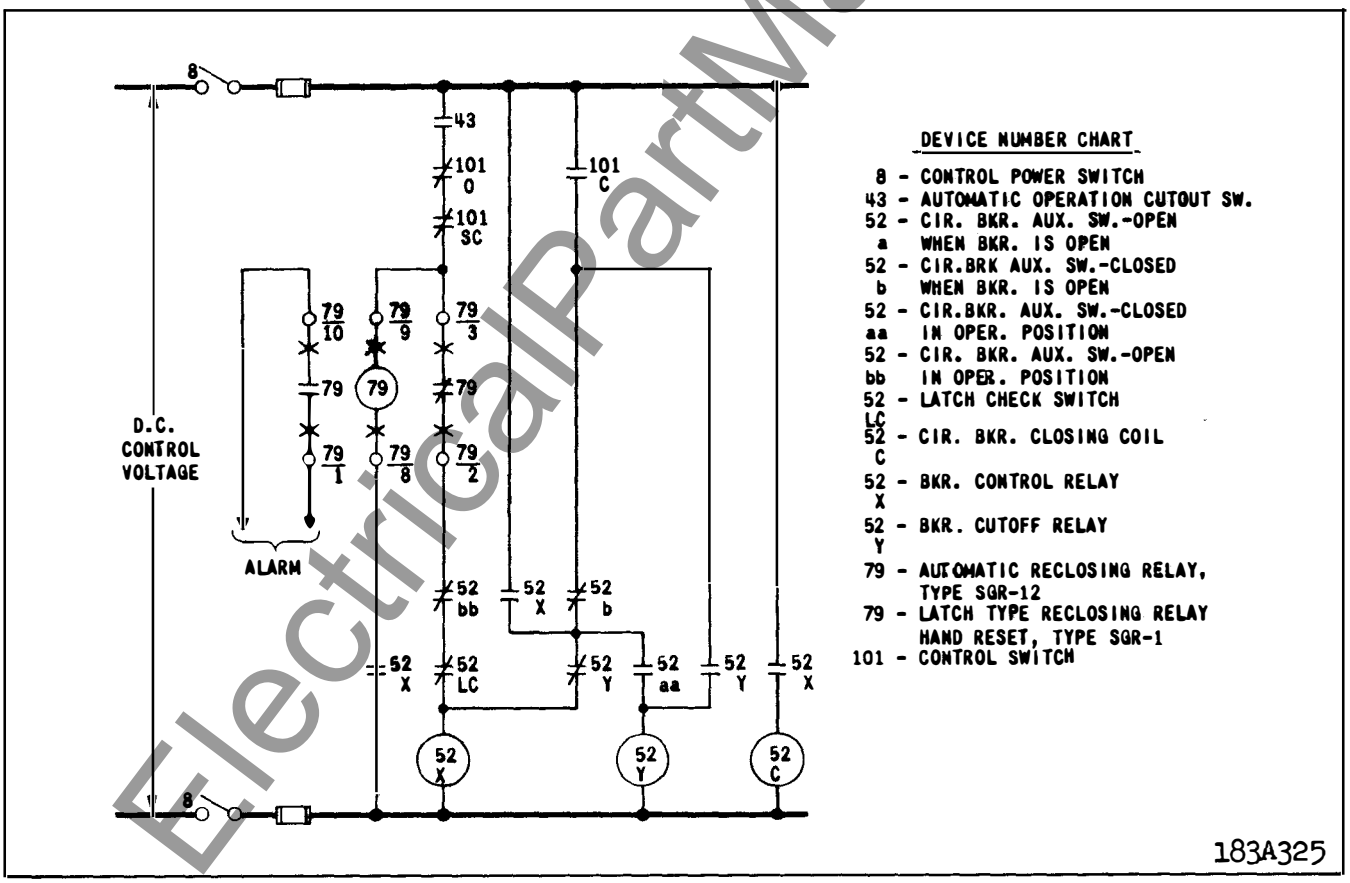
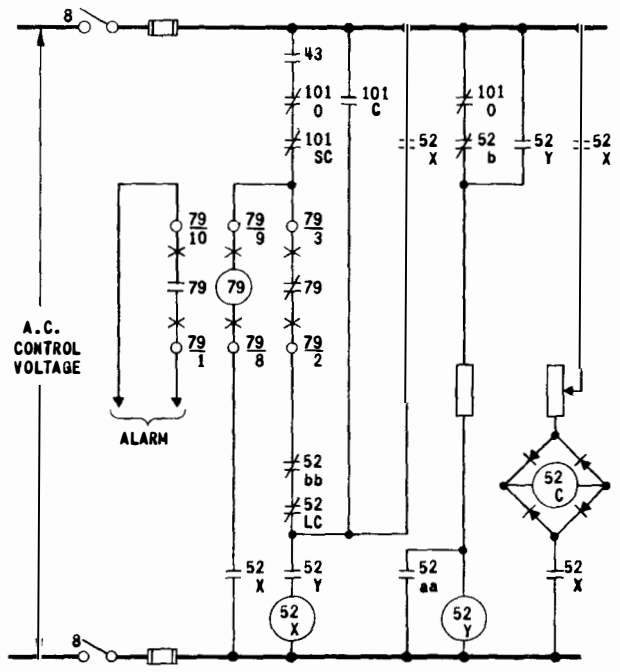


Fig. 3. External Schematic of the SGR-1 Relay in the FT11 Case for Instantaneous One-Shot Reclosing – D.C. Breaker Control.



DEVICE NUMBER CHART

8 - CONTROL POWER SWITCH
43 - AUTOMATIC OPERATION CUTOUT SW.
52 - CIR. BKR. AUX. SW. - OPEN
a WHEN BRK. IS OPEN
52 - CIR. BKR. AUX. SW.- CLOSED
b WHEN BKR. IS OPEN
52 - CIR. BKR. AUX. SW. - CLOSED
aa IN OPER. POSITION
52 - CIR. BKR. AUX. SW. - OPEN
bb IN OPER. POSITION
52 - LATCH CHECK SWITCH
LC
52 - CIR. BKR. CLOSING COIL
C
52 - BKR. CONTROL RELAY
X
52 - BKR. CUTOFF RELAY
Y
79 - LATCH TYPE RECLOSING RELAY, HAND RESET, TYPE SGR-1
101 - CONTROL SWITCH

183A326

Fig. 4. External Schematic of the SGR-1 Relay in the FT11 Case for Instantaneous One-Shot Reclosing – A.C. Breaker Control.

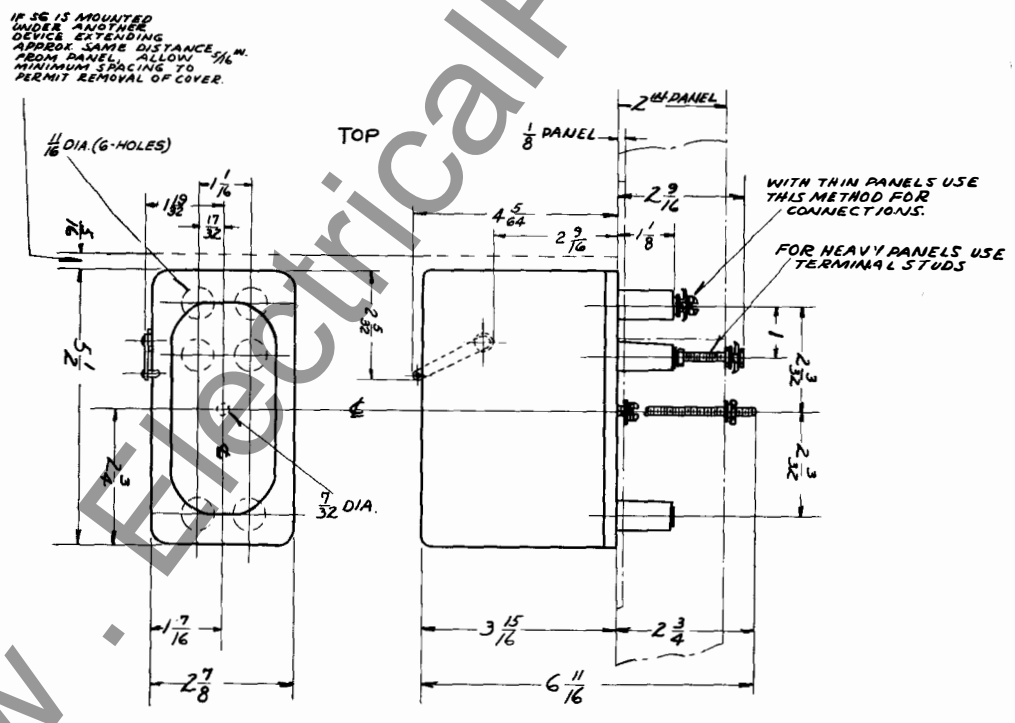


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Fig. 5. Outline and Drilling Plan for the Molded Case. For Reference Only.

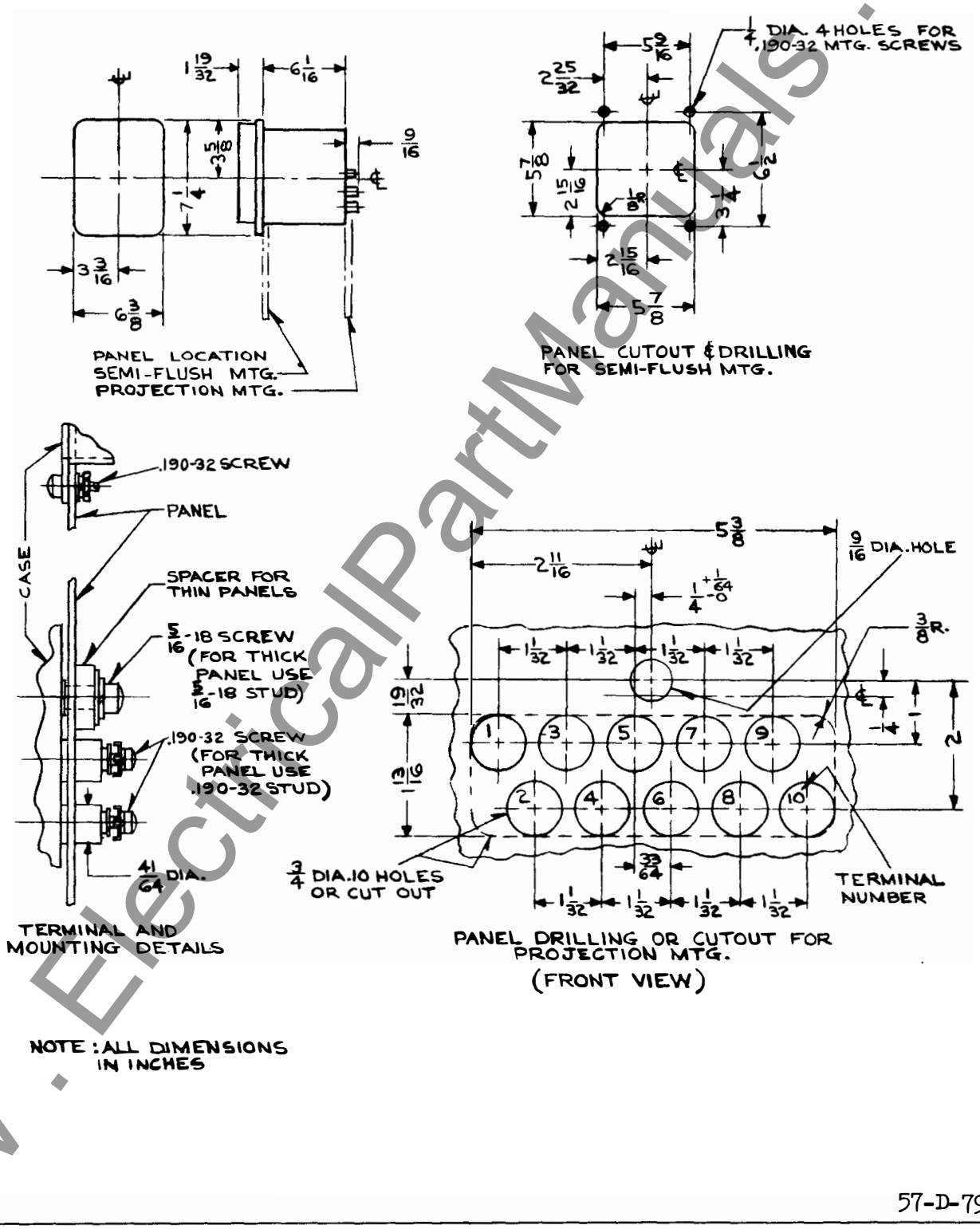

Fig. 6. Outline and Drilling Plan for the SGR-1 Relay in the FT11 Case.

WESTINGHOUSE ELECTRIC CORPORATION

METER DIVISION • **NEWARK, N.J.**

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