Westinghouse

Bill Book Relay

TYPE TR D-C. AUXILIARY TRIPPING RELAY

INSTRUCTIONS

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.

APPLICATION

This auxiliary relay consists of an SG element, and the CS-1 and CS-2 contactor switch elements normally supplied in the type RSN relay provides a trip circuit delay of approximately 1 cycle which prevents the normal operation of line protective tubes from tripping the carrier or other high speed relays. The CS-1 and CS-2 relays provide the means of tripping two breakers as well as the associated seal-in circuits.

CONSTRUCTION

SG Element

The SG element is a clapper-type element consisting of a solenoid coil and core, a hinged moving armature, and a U-shaped magnetic yoke. The coil and core are mounted in the yoke with the armature hinged to the lower end of the yoke. Two moving contact arms are fastened to the hinged end of the armature with its projecting contact end free to move in either direction from the armature against spring compression. The moving contact arm has silver contact surfaces on either side so that either make or break contact can be secured by reversing the position of the stationary contact arm. The two stationary contact arms project downward from separate mounting posts. A single screw holds the arm to the post. The flux produced by the energized coil pulls the armature toward the core, making or breaking the contacts as desired. Contact follow on the make contacts is secured by permitting the contacts to make before the armature travel is complete, thus deflecting the contact arm against a spring.

Auxiliary Contactor Switch

These are small solenoid-type d-c operated elements. A cylindrical plunger with a silver disc mounted on its lower end moves in the core of the solenoid. As the plunger travels upwards, the disc bridges three silver stationary contacts.

OPERATION

The coil of the SG element is energized thru the trip contacts of the protective relays and the breaker "a" switch. The high resistance of this coil limits the current thru the protective relay contacts to a value below the pick-up of their seal-in contactor switches. The pick-up time of the SG coil is approximately 1 cycle and thus if the trip contacts are still closed after this interval, the SG contacts close to energize the CS-1 and CS-2 contactor switch coils. The CS-1 contacts provide double trip, and the CS-2 contacts seal in around the trip and SG contacts. Thus, after the SG contacts have picked up the CS-2 contacts, the trip circuit is completed and sealed in until after the breaker "a" switches operate.

It is necessary to add resistance in the CS-1 and CS-2 coil circuits to limit the current in these coils. This is done by separate external resistors, 22 ohms for the 125 volt d-c trip circuits and 44 ohms for the 250 volt d-c trip circuits.

INSTALLATION

The relays should be mounted on switchboard panels or their equivalent in a location free from dirt, moisture, excessive vibration and heat. Mount the relay vertically by means of the two mounting studs. Either of these studs may be utilized for grounding the relay base. The electrical connections may be made direct to the terminals by means of screws for steel panel mounting or to terminal studs furnished with the relay for ebony-asbestos or slate panel mounting. The terminal studs may be easily removed or inserted by locking two nuts on the studs and then turning the proper nut with a wrench.

ADJUSTMENT AND MAINTENANCE

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.

All contacts should be periodically cleaned with a fine file. S#1002110 file 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.

SG Element

The make contact follow should be 3/64 inch at the contact with the armature closed, or slightly more than 1/32 inch, if measured between the top of the moulded armature block and

contact finger. This adjustment can be made by bending the stationary arm slightly. After adjusting the make contact follow, adjust the armature stop on the yoke so that a 3/32 inch gage will just fit in the contact gap with the armature against the back stop. The pick-up of the SG element is approximately 22 volts or .021 ampere d-c.

Contactor Switch

Adjust the stationary core of the switch for clearance between the stationary core and the moving core of 1/64 inch when the switch is picked up. This can be done by turning the relay up-side-down and screwing up the core screw of the switch until the contact just separates. Then back off the core screw approximately one turn and lock in place. This prevents the moving core from striking and sticking to the stationary core because of residual magnetism. Adjust the contact clearance for 1/32 inch by means of the two small nuts on either side of the Micarta disc. The switch should pick up at 1.5 amperes d-c. Test for sticking after 30 amperes d-c is passed thru the coil.

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.

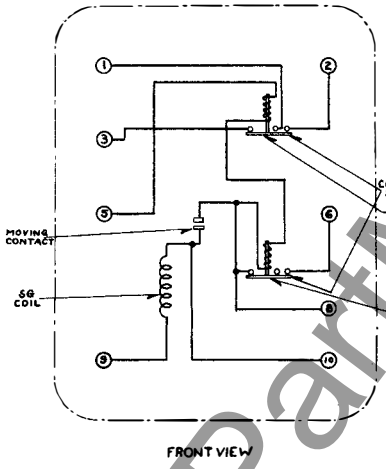

Figure 1
Internal Connections of the Type TR Relay.

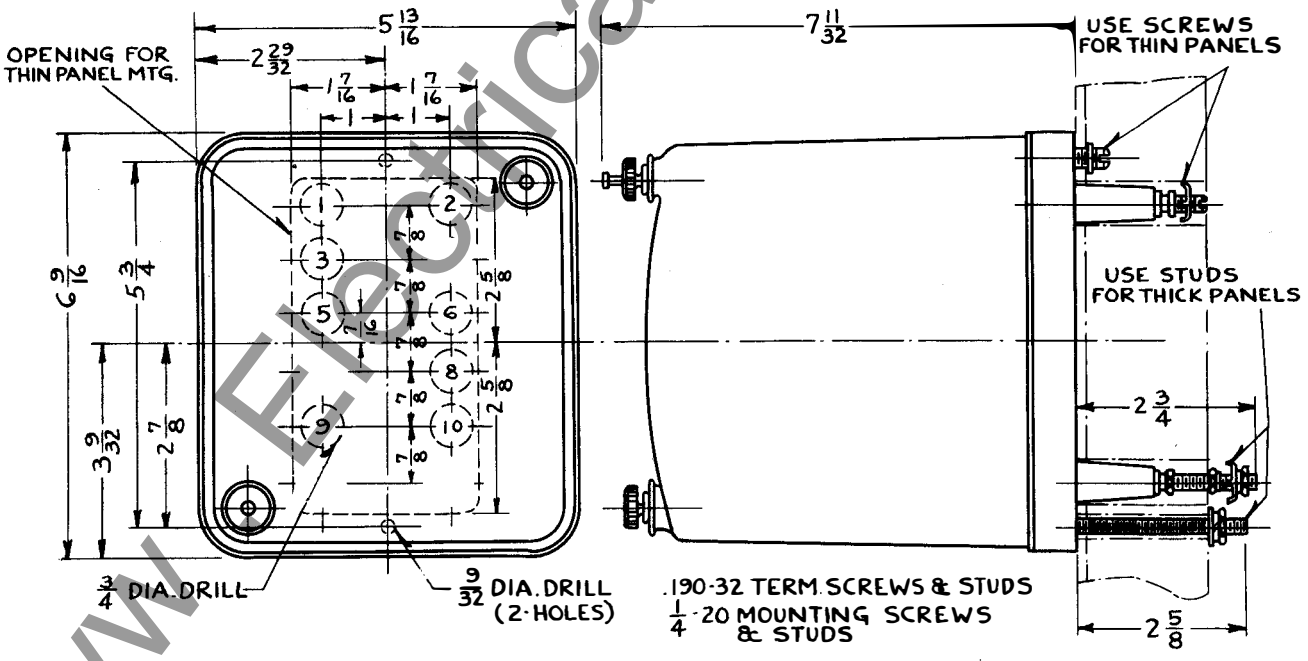

Figure 2
Outline & Drilling Plan for the Standard Projection Type Case.