Type BN
Desensitizing Relay
INSTRUCTIONS

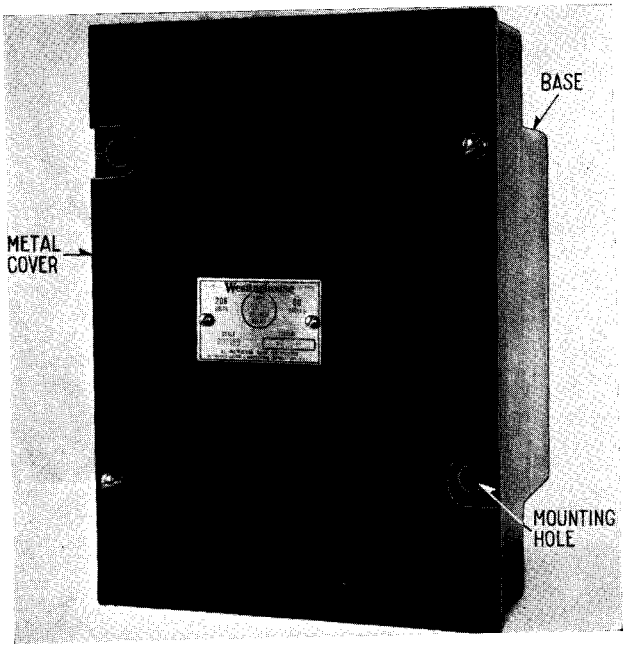


FIG. 1—TYPE BN DESENSITIZING RELAY, FRONT VIEW WITH COVER ON.

GENERAL

The type CN-33 relay operates almost instantaneously on reverse power to close its tripping contacts. Under light load conditions on the network, this may result in false tripping of the circuit breaker due to momentary power reversals.

The type BN desensitizing relay provides time delay reverse current settings up to the full load rating of the transformer and instantaneous tripping for larger reverse currents. Both the time delay and the instantaneous trip setting are adjustable.

Note: When the BN relay is removed from the control panel, the circuit breaker must be open and an auxiliary panel must be plugged in to complete the current transformer circuits, before the circuit breaker is reclosed.

CONSTRUCTION

The instantaneous trip elements are small solenoid operated contactors that can be adjusted by varying the position of their contact and cores to operate at approximately 100 to 200% of the current rating of the relay.

The timing element consists of a bi-metallic actuating spring and heater. Its motion is opposed by a second piece of bi-metal that supports a moving contact and provides ambient temperature compensation. Operating time is varied over a range of 1 to 5 minutes by limiting the travel of the moving contact between adjustable front and back stationary contacts. The entire operating cycle employs both heating and cooling times of the bi-metallic element so as to reduce errors that would otherwise result from the cumulative heating effects of successive operations.

All elements of the BN relay are mounted in a single quick detachable case with plug type terminals similar to the CN-33 relay.

OPERATION

The wiring diagram is shown in figure 2. In this figure, the six terminals at the bottom connect to the current transformers and thus connect the three overcurrent relays in the current circuit. The contacts of these three relays are connected in parallel with each other. The right hand contact of the "SG" relay is connected in series with the lower contact on the bi-metallic spring. This series circuit is also connected in parallel with the contacts of the overcurrent relays so that together they make four parallel paths between the second and third terminal from the left at the top of the relay. The second terminal is connected to the CN-33 relay trip contact and the third terminal is connected to the trip coil so that when the CN-33 relay trip contact closes, the closing of any one of the overcurrent relays or by-metal contacts of the BN relay will trip the circuit breaker.

The overcurrent relays will close their contacts instantaneously to trip the circuit breaker if the current through them exceeds the value for which they are adjusted. The bi-metal contact works through a series of switching and thermal operations as follows:

Starting with the relay contacts in the position shown in figure 2, there is a circuit from the second terminal of the relay through the closed contact of the SG relay to the heater and back

Type BN Desensitizing Relay—Continued

INSTRUCTIONS—Continued

to the fourth terminal which is connected to the control bus. The heater warms the bi-metallic spring so that it bends and closes its upper contact. This completes the circuit from the second terminal to the SG relay coil and back to the fourth terminal so that the SG relay will operate. The operation of the SG relay opens its contact which is shown closed and closes the other two contacts. Closing the left hand contact parallels the bi-metallic spring contact and seals in the SG relay. Closing the right hand contact sets up the circuit from the third terminal of the relay to the lower contact of the bi-metal element. Opening the normally closed contact of the SG relay interrupts the current to the heater so that the bi-metallic spring cools. When the bi-metallic spring cools sufficiently, it closes its lower contact and thus completes the circuit between the second and third terminal.

MAINTENANCE

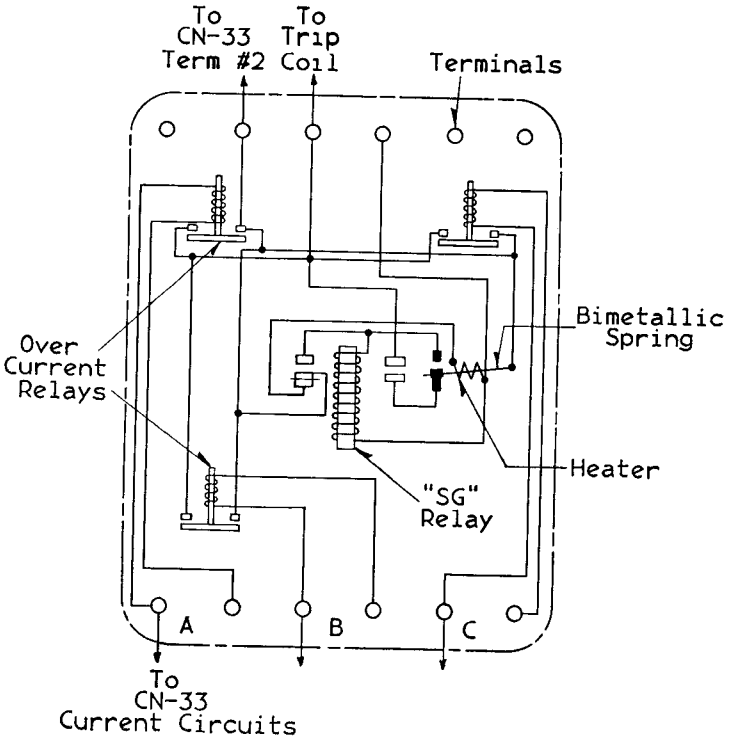
Note: Whenever the BN relay is removed from the control panel for maintenance, the transformer circuit breaker must be open and the current terminals of the BN relay mounting block must be short-circuited before the circuit breaker is reclosed.

The only maintenance required on the BN relay is occasional dressing of the contacts when they show signs of burning.

If the system conditions should change so as to require different characteristics of the BN relay, both the time delay element and the instantaneous elements can be adjusted. The current setting of the instantaneous element can be adjusted over a range of approximately 100% to 200% of the relay rating by changing the position of the core in the solenoid coil. The time delay element can be adjusted over a range of approximately 1 minute to 5 minutes by adjusting the distance between the two stationary contacts.

RENEWAL PARTS

Renewal parts are not normally required and for that reason no list is given here. If any parts are required, they may be ordered from the nearest Westinghouse Electric and Manufacturing Company Sales Office or direct from the Sharon, Pa., Works by giving a description of the part required and a reference to the transformer serial number or stock order number as stamped on the transformer nameplate.



FRONT VIEW

FIG. 2—RELAY, TYPE BN WIRING DIAGRAM

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