DESCRIPTION • INSTALLATION

INSTRUCTIONS

TEMPERATURE RELAY

Hottest Spot **Two Switch** **Direct Mounted**

FIG. 1. Front View of Temperature Relay.

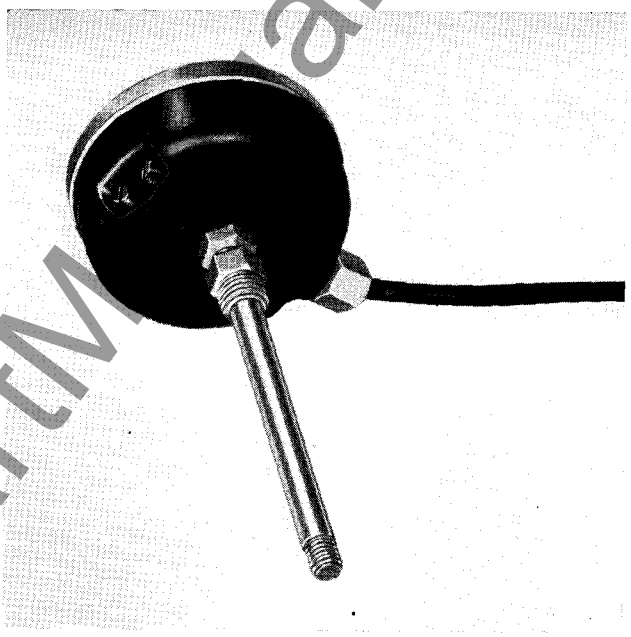

FIG. 2. Rear View of Relay, Showing Screw Plugs.

THE TWO SWITCH TEMPERATURE RELAY designed for application on Westinghouse transformers or related apparatus, is used where two control circuits are required. This leaflet covers the Hot Spot type of relay. The relay is operated by a bimetallic element, and is made weatherproof and submersible. The heating coil is designed to heat the bimetallic element to the temperature of the hottest spot in a transformer winding, when receiving a current proportional to that in the transformer winding.

The relay is designed for use where two control circuits are required in addition to existing switchboard or indicating hot spot equipment. The two switches of the relay are set at slightly different temperature levels, both within the range normally used for controlling auxiliary cooling by hot spot temperatures. The circuits are separate so that a-c and d-c may be used simultaneously if desired.

DESCRIPTION

The relay (Fig. 1) is a precision instrument which is operated by a bimetallic-spiral actuating element in the stem, which fits closely into a well. The well is of thin-walled construction and screws into the tank wall making an oil tight connection. The instrument can be removed from the well in the tank wall without the loss of liquid and without lowering the oil level.

Note: Do not fill the well with a solid or liquid before inserting the stem of the relay since this may damage the instrument without appreciably helping in the transfer of heat from the heating coil to the sensitive element. The relay should not be tightened in the well any more than is necessary to place the decal in an upright position.

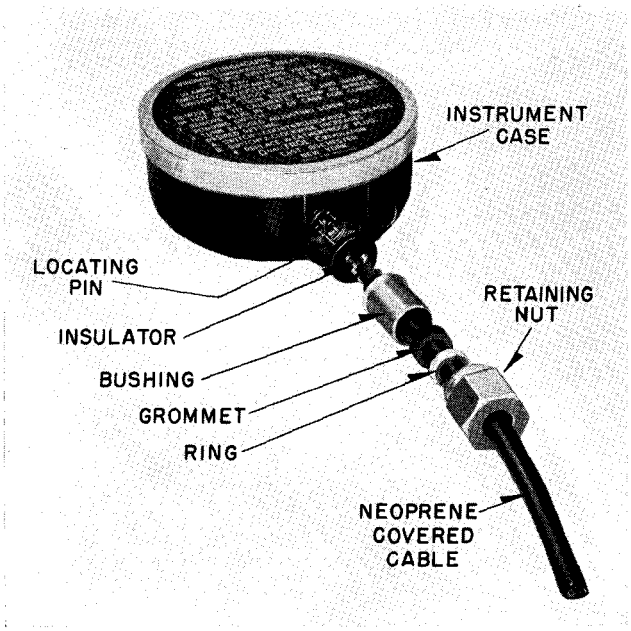

FIG. 3. Triple Seal Connection.

The control circuit leads are brought through the underside of the case by means of a triple seal connector, the details of which are shown in Fig. 3. This connector consists of the following:

1. Four protruding terminals moulded in the case and a locating pin to prevent making incorrect connections.

2. A rubber insulator which has four terminals to mate with the terminals in the case, and a hole to match the locating pin. The ends of the leads are tinned and crimped into the terminals of the insulator.

3. A bushing to compress the insulator against the instrument case.

4. A grommet to make a seal between the rubber covered cable and the bushings.

5. A ring to compress the grommet against the cable.

6. A retaining nut, to hold the component parts of connector tight in the case. This retaining nut is screwed into place.

There are two micro-switches in this type temperature relay. Switch No. 1 is set to close at 75°C, and switch No. 2 is set to close at 80°C. These are nominal values, and will be supplied unless otherwise ordered. Both switches open at 5°C less than the closing temperature. The ratings for the switches are given in Table No. 1, and the connection diagram is shown in Fig. 5.

TABLE NO. 1

VOLTAGE	NON-INDUCTIVE LOAD—AMPS.	INDUCTIVE LOAD AMPS. L/R. = 026*
125 AC	10	10
250 AC	5	5
125 DC	0.5	0.05
250 DC	0.25	0.025

*Equal to or less than .026. If greater refer to factory for adjusted rating.

The switches are adjustable over a range of ±10°C in relation to the above mentioned values. To adjust switches to a different value, follow the directions printed on the decal face.

When checking circuits through this instrument it is necessary to observe the switch limitations of Table No. 1. This means that a low voltage bell ringer cannot be used unless switched through a high impedance relay. An indicating light type device is generally recognized as best for checking circuits through instruments containing micro-switches of similar capacities.

SHIPPING AND RECEIVING

The current transformer is generally shipped as part of the main transformer. It is usually of the through type which is slipped over the lower end of the bushing, and mounted on the under side of the cover. Sometimes it will be mounted on the top of the terminal board, bridges, or end frames. In this case, a micarta tube will probably be used to conduct the current transformer leads to the ter-

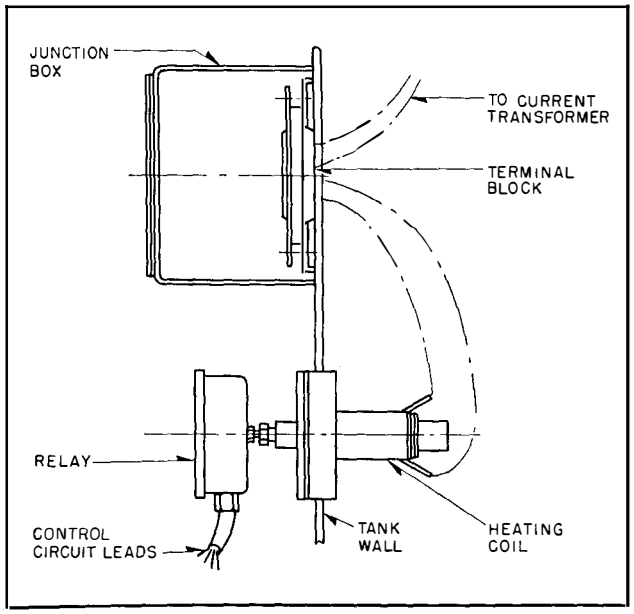

FIG. 4. Mounted Relay With Junction Box.

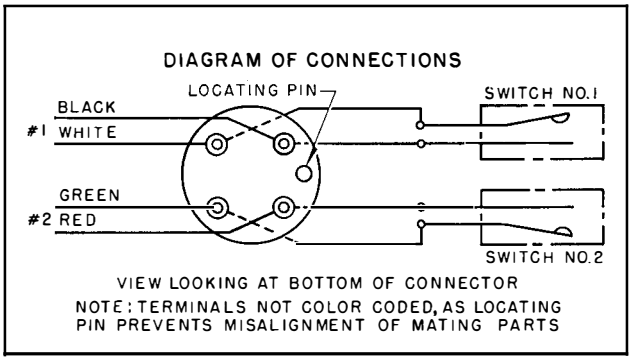

FIG. 5. Connection Diagram for Circuit Control Leads.

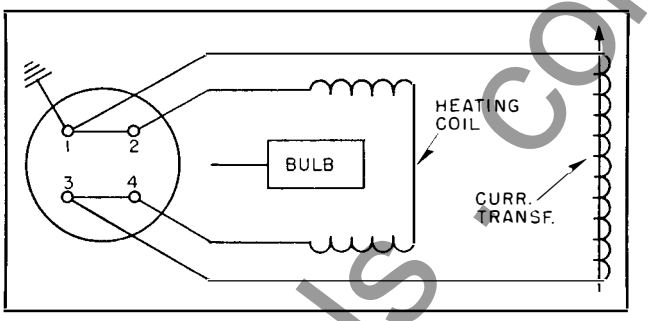

FIG. 6. Connection Diagram for Current Transformer and Heating Coil.

minal box. This tube will be installed in place on the current transformer. If the main transformer is not shipped in its tank, the tube is slid down or removed and tied to the current transformer.

The external terminal block will always be in place, and will be covered by a weatherproof conduit box. It may be a block as shown in Fig. 4 or a large block to take care of a number of leads including some not for the hot spot relay. The heating coil is fastened in place on the well of the temperature relay.

The temperature relay is shipped mounted on the tank wall, so that no installation is necessary.

OPERATION

The current transformer is mounted inside the case of the power transformer, usually on a bushing. Its primary winding carries the main current of one of the transformer's windings and its secondary winding delivers to the heating coil a reduced current which is at all times proportional to the load current.

The insulation of the current transformer serves to protect the heating coil and temperature relay equipment from the high voltage of the main transformer windings.

The heating coil is placed in the hot surface oil and its windings are worked at the same current density as the main transformer. In addition, the insulation of the heating coil windings has the same elevation in temperature above the oil as the windings of the main transformer. By these methods the temperatures inside the transformer windings are duplicated in the area surrounding the bimetallic element of the relay.

RENEWAL PARTS

If it becomes necessary to repair the instrument, contact the nearest Westinghouse Office. Include a complete description of the part wanted along with the data on the nameplate attached to the transformer tank wall.

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