INSTRUCTIONS

TEMPERATURE INDICATOR

Three Switch—Dial Type

Non-Submersible **Remote Indicating**

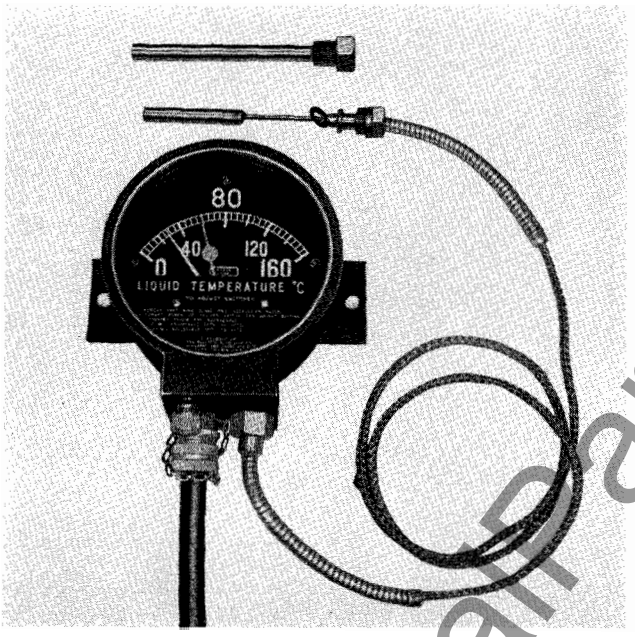

FIG. 1. Front View of Indicator, Showing Flexible Tube for Distant Mounting

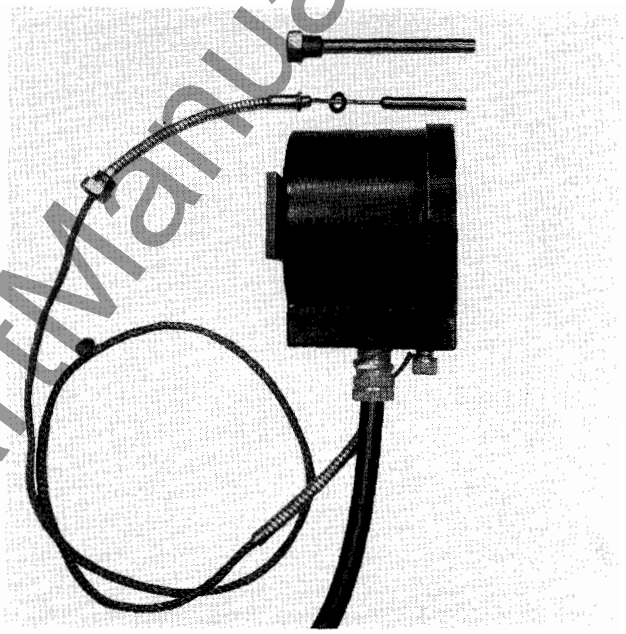

FIG. 2. Side View of Indicator, Showing Resetting Stem Cover

THE THREE SWITCH TEMPERATURE INDICATOR designed for application on Westinghouse transformers or related apparatus, is used where both fan control and alarm circuits are required. This leaflet covers the type of indicator which depends on the hot oil temperature. It is a dial type instrument operated by a Bourdon gauge connected to a thermometer bulb located in the region of the hottest oil. It is a self-contained, weatherproof unit designed for outdoor application on transformers.

The three switches of the indicator are set at different temperature levels; the lower level switches operate the fan control circuit, and the higher level switch controls the alarm circuit. The fan control circuits serve to give added cooling when the transformer temperature comes within the ranges of the switches. The alarm circuit operates at a higher temperature range to give warning in case the fans, for any reason, do not limit the temperature to a proper range. The circuits are separate so that both a-c and d-c may be used.

RECEIVING

Shipment. The indicator is usually shipped mounted on the transformer case, requires no maintenance, and is suitable for use in oil or Inerteen (Askarel).

Unpacking. When indicators are shipped as a separate item, to be installed in the field, they should be carefully unpacked and installed as shown on the transformer outline drawing.

Note: Particular care should be used not to bend the capillary tube at sharp angles or flex it unnecessarily during installation or service.

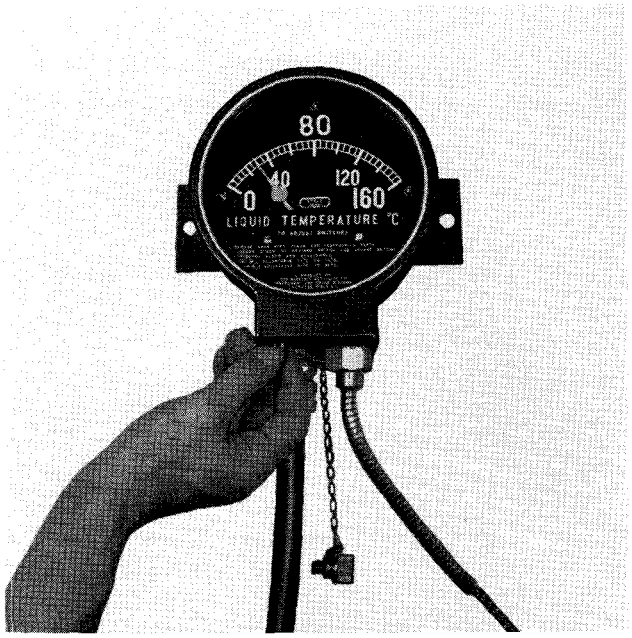

FIG. 3. Method of Resetting Maximum Indicating Pointer. Maximum Pointer Shown Reset

DESCRIPTION

The Westinghouse non-submersible temperature indicator is a dial type instrument. It consists of a Bourdon gauge connected through a capillary tube to a thermometer bulb 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. The portion of the capillary tube outside of the transformer, that is, from the gauge on the side of the tank to where the capillary tube enters the cover, is protected by a flexible covering. The long flexible capillary tube of the distant type temperature indicator permits mounting the gauge on the side of the tank on a level with the eye. This capillary tube should be installed so that long bends or spans are not free to vibrate, as this may result in failure of the tube.

Note: Do not fill the well with a solid or liquid before inserting the stem of the indicator since this may damage the instrument without appreciably helping in the transfer of heat from the heating coil to the sensitive element.

The dial is calibrated in degrees centigrade and is easily read because of the contrasting black face with yellow characters, graduations and indicating pointer.

A maximum indicating pointer, red in color, is used to indicate the maximum temperature reached between readings. This hand is easily reset by removing the screw at the bottom of the indicator and pulling down on the reset stem. The method of resetting the maximum indicating pointer is shown in Fig. 3.

When the alarm and control circuits are used, external connections are made through the neoprene jacketed cable. A cable grip, which screws up into the mounting bracket, serves to grip the lead cable and seals the gauge from the atmosphere.

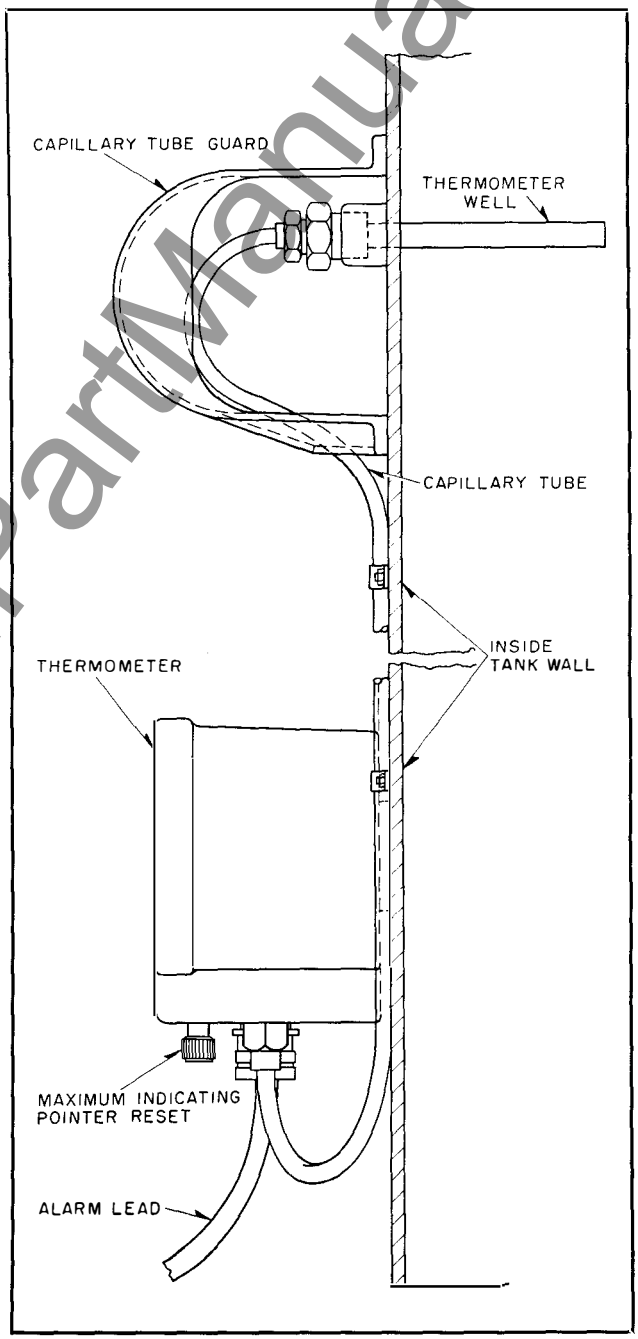

FIG. 4. Sectional View of Transformer Showing Mounting of Indicator with Flexible Tube

If the contacts are not to be connected into a circuit, the external neoprene jacketed cable is coiled and taped in place for possible future use.

There are three micro-switches in this type of indicator. Switch #1 is set to close at 60°C for a control circuit. Switch #2 is set to close at 65°C for the other control circuit, and switch #3 is set to close at 80°C for the alarm circuit. These are nominal values, and will be supplied unless otherwise ordered. All of the switches open at 10°C less than the closing temperature. The ratings for the switches are given in Table No. 1, and the connection diagram as shown in Figure 5.

The switches are adjustable over a range of ±10°C in relation to the above mentioned values.

Field Test. Remove the indicator from its well and submerge the stem up to the brass fitting in a closely temperature-controlled, well agitated oil bath. Check the temperature by placing a thermocouple or other accurate temperature measuring device on the stem about two inches from the end. The indicator should be accurate within ±2 degrees C, allowing a minimum of 15 minutes for the indicator to come up to temperature. The indicator will hold its accuracy unless the bulb or capillary tube is damaged or there is a loss of fluid pressure. To adjust the switches to a different value, follow the instructions printed on the instruction plate on the face of the indicator.

Important: When checking circuits through this instrument it is necessary to follow 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.

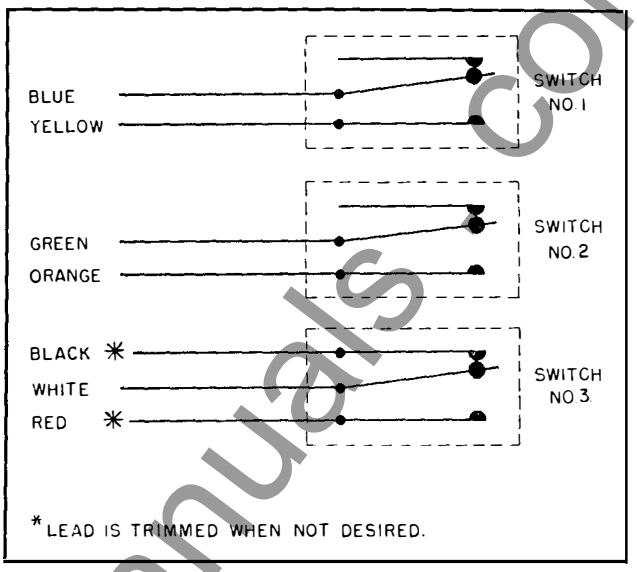

FIG. 5. Diagram of Connections

TABLE NO. 1

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

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

RENEWAL PARTS

If it becomes necessary to repair the instrument, contact the nearest Westinghouse Office. Complete instructions will then be given by the District Engineering & Service Division for the return of the instrument to the factory at Sharon, Pa., to have it repaired and placed in first class condition.

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