



DESCRIPTION

INSTALLATION

INSTRUCTIONS

COMBINATION INSTRUMENT

Pressure—Fluid Level—Temperature

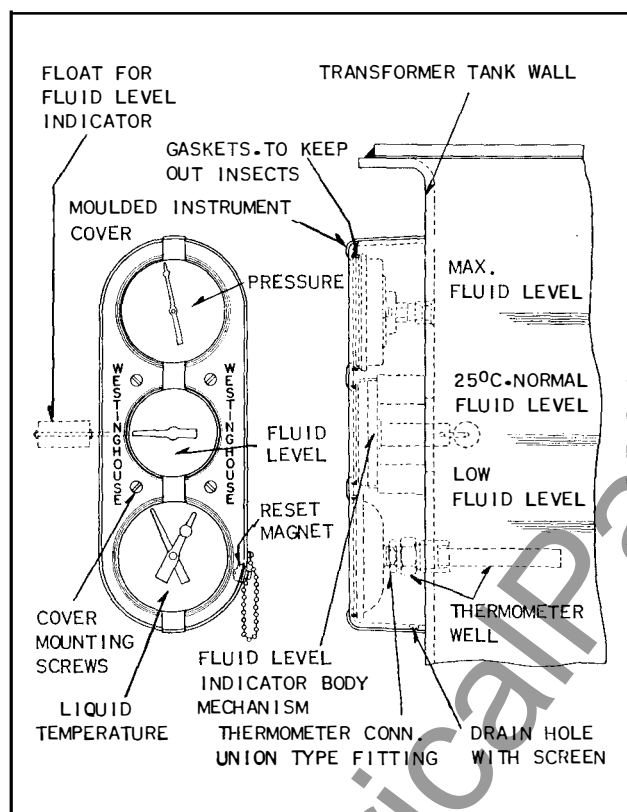


FIG. 1. Front and Side View of Combination Instrument

THE COMBINATION INSTRUMENT designed for application on Westinghouse Transformers is used to give indication of **FLUID LEVEL**, **FLUID TEMPERATURE** and **GAS SPACE PRESSURE**. The instrument consists of standard indicating elements grouped together and covered by a moulded cover in such a way as to give the appearance of a single instrument. See Fig. 1.

DESCRIPTION

The fluid level indicator element is a precision instrument consisting of two main parts, the bezel and the body, and are interchangeable for the same size of device. See Fig. 2. The bezel or outer assembly includes the calibrating dial and indicating needle. It is hermetically sealed and should not be

subjected to a vacuum since the internal pressure might break the glass. The dial has a black background with yellow markings for high visibility. The indicating needle, also painted yellow, is directly mounted on the forward end of a shaft, the other end of which carries a powerful actuating magnet. The bezel, when in place, covers and protects the mounting screws with which the body is attached to the flange of the transformer tank wall. The body is sealed against oil leakage to the outside and encloses another powerful magnet opposite the magnet in the bezel and is coupled through a shaft to the float arm. See Fig. 2. In operation any motion of the float arm rotates the body magnet, which in turn positively displaces the bezel magnet, thus moving the indicating needle.



FIG. 2. Bezel (left) Body with Float and Rod at Back (right)

The fluid temperature indicator element is a precision instrument whose needle is directly coupled to a bimetallic, spiral actuating element in the stem, which fits closely into a well. The well is of thin-walled construction and screws into a fitting on the transformer case, making an oil tight connection. See Fig. 3.

The dial is calibrated in degrees centigrade and is easily read because of the contrasting black face with yellow characters, graduation and indicating pointer. A maximum indicating pointer, red in color, is used to indicate the maximum

COMBINATION INSTRUMENT

temperature reached between readings. The hand is reset by wiping a magnet across the face of the dial. The magnet must be held with the poles in the proper position so as to attract the maximum indicating pointer. The magnet is attached to a small chain on the cover to prevent misplacing after using and self-supporting in a metallic socket on the side of the cover.

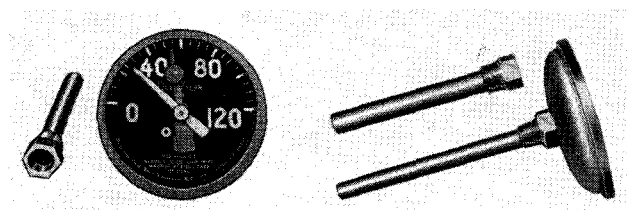


FIG. 3. Front and Side View of Temperature Element

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 oil to the heat sensitive element. The indicator should not be tightened in the well any more than is necessary to place the dial in an upright position.

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 compound pressure indicator element is a reliable diaphragm type instrument with an easily read dial. The dial has a black background with yellow markings for high visibility. This indicator has an accuracy of 3% of the dial range, plus or minus .3 Lb. of the indicated pressure.

On some types of transformers an additional mounting is supplied so that the location of the combination instrument can be changed at some future date without draining fluid from the transformer case. This mounting is supplied complete with protective cover, thermometer well, fluid indicator body and plug. See Fig. 4.

To change the location of the combination instrument proceed as follows:

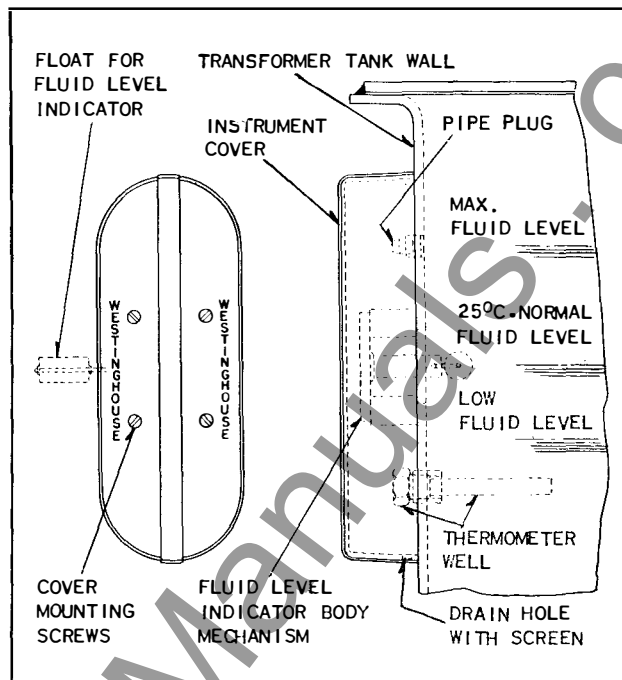


FIG. 4. View of Extra Mounting Supplied on Some Transformers

1. Remove both the instrument cover and the protective cover by removing the mounting screws.
2. Relieve the gas space pressure and remove plug.
3. Remove the fluid level indicator bezel and install on the additional indicator body.
4. Remove the fluid temperature indicator from the well and install in the additional well.
5. Remove the pressure indicator and install in the additional fitting provided using thread cement on the pipe threads.
6. Replace pipe plug and check for leaks.
7. Replace covers.

INSTALLATION

The instrument is shipped fixed to the tank wall, so that no installation is necessary.

RENEWAL PARTS

If repairs to the instrument are necessary, contact the nearest Westinghouse Office.



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