Vaisala's ppm calculation for moisture in transformer oil

Improved Maintenance for Transformers

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Vaisala's microprocessor-based HMP228 transmitter enables continuous moisture and temperature measurements in transformer oil.

The presence of moisture in liquid transformer insulation plays a critical role in the life of a transformer. Determining the amount of moisture in oil is an essential part of any comprehensive transformer maintenance program. The Vaisala microprocessor-based HMP228 transmitter enables continuous moisture and temperature measurements in transformer oil.

Excessive moisture content in oil makes the insulation materials age more quickly and reduces their dielectric strength. In general, the mechanical life of insulation is reduced by half every time that the water content is doubled. The rate of thermal deterioration of the paper is proportional to its water content.

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Water in mineral oil transformers creates the risk of bubble formation, when desorption of water from the cellulose increases the local concentration of gases in the oil. Accurate moisture measurements can also provide warning of leaks in the oil systems, as the water is absorbed from the surrounding air.

Reliable sensors technology

The HMP228 transmitter incorporates the latest version of the Vaisala capacitive thin film polymer sensor.

It operates by measuring changes in its capacitance as the thin film absorbs water molecules from the oil.

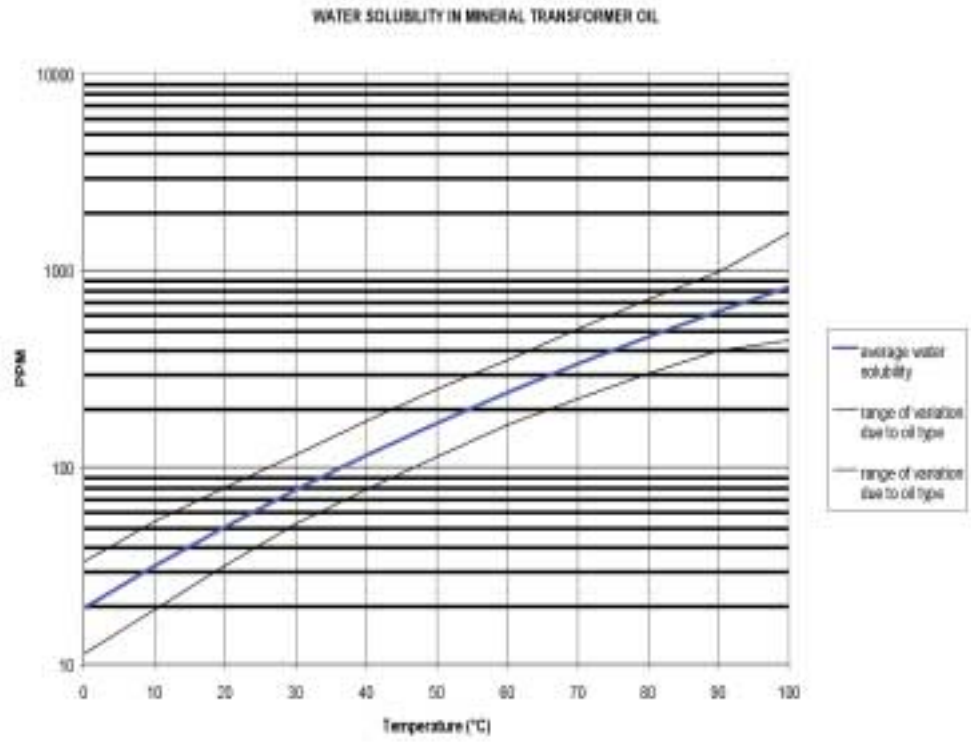
Principle measured and calculated values

Water activity is the principle measured value. Water activity immediately indicates whether the oil is too moist. The measurement remains proportional to the saturation level of water in each individual oil, independent of the aging or temperature of the oil.

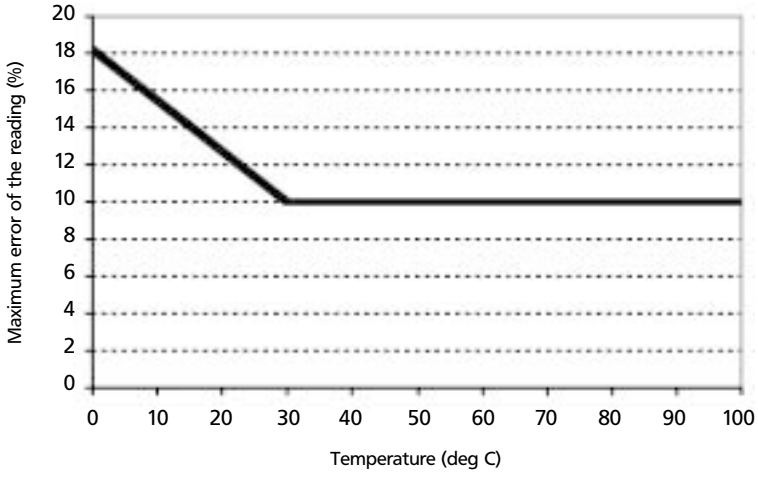
Traditionally, the transformer field has used ppm values. Thus, Vaisala offers the Calculation Model with Average Coefficients for mineral transformer oils and the Calculation Model with Oil Specific Coefficients for mineral and silicon based oils. All silicon based transformer oils need to use the Calculation Model with the Oil Specific Calculation Model.

HMP228 identifies servicing requirements

In the electrical industry, moisture measurements indicate the condition of transformer oil and identifies servicing requirements. This HMP228 Moisture and Temperature Transmitter, improves the maintenance of transformers, and enables reliable and continuous measurement of their transformer oil moisture and temperature. ■



Moisture levels in oil are affected by temperature cycling of a transformer. The extent to which oil is water soluble is dependant on temperature: the more the temperature rises, the more soluble it is.



The maximum number of errors caused by deviation of mineral oils using Average Calculation Model.