



DIRANA – Dielectric Response Analyzer

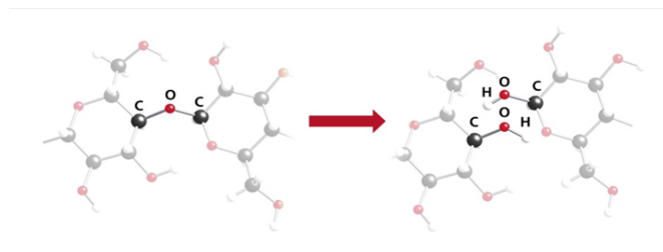
What is DIRANA?

The DIRANA which stands for Dielectric Response Analyzer is the latest testing equipment to join our testing equipment fleet. The DIRANA can determine the condition of high-voltage insulation systems like in power transformers, bushings, cables and generators with dielectric response analysis.

The DIRANA deploys the frequency domain spectroscopy (FDS) and the polarization and depolarization current (PDC) methods to determine the moisture content in oil-paper insulations. The measurement results are compared against values from an integrated database and the moisture content is graded between "dry" and "very wet" as per IEC 60422.

Why choose DIRANA?

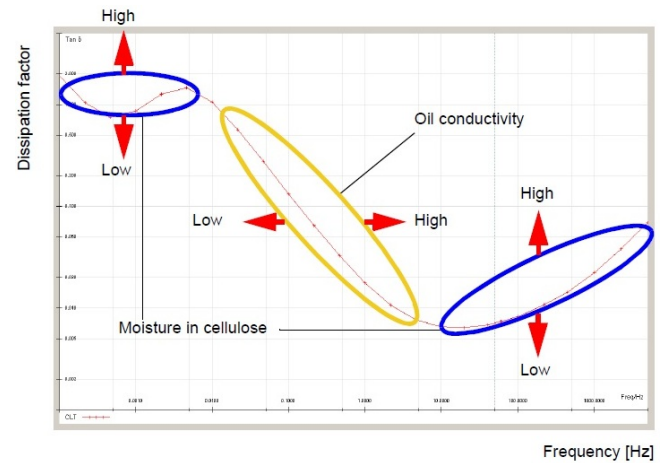
During the service life of the high-voltage equipment such as power transformers, rotating machines, and cables, its insulation system is subjected to numerous stresses including high temperatures, vibration, electric fields etc. The degradation of oil is primarily a chemical process that is substantially accelerated by heat and the presence of oxygen and moisture. Moisture is particularly detrimental to paper and is a good aging indicator.



Split of a cellulose chain
due to hydrolysis

By comparing the dielectric response with the previous measurements or with the model curves based on the insulation system's construction, the *DIRANA* provides an indication of the insulation condition such as:

- Moisture content in the oil/paper insulation
- Faults in OIP, RBP, and RIP high-voltage bushings
- Faults in the generator, motor, and cable insulation



When do we use DIRANA?

The concept of combining FDS and PDC methods – makes the *DIRANA* an intelligent, fast, and powerful solution for the insulation diagnosis of the high-voltage equipment in the power industry. Some of its applications are:

- Water analysis of oil-paper insulation
- Capacitance and dissipation factor measurement on power transformers
- Dissipation factor measurement and determination of ageing on bushings
- Diagnosis of generator, motor and cable insulation, as well as instrument transformers



Some of the key features

- Extremely fast measurements reduce downtimes
- Automatic determination of the water content with the DIRANA software (no expert knowledge required)
- Reliable moisture content determination for new and aged oil-paper insulation
- Evaluation of very dry transformers due to a wide measuring range of 5 kHz to 10 μHz

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