TRAFTEK

Measuring Instrument for on-site FRA, Winding Impedance and Vibration Testing of Power Transformers

The TRAFTEK equipment is designed for scanning the geometrical and mechanical movements and distortions of the transformer winding using the swept frequency measuring method.

There are several methods under development all over the world for winding movement detection. It is known that a transformer winding with its stray capacitances and inductances forms a complicated RLC network. If we apply small AC voltage (about $5V_{RMS}$) with a frequency range of 50Hz to 1MHz we shall get a typical voltage attenuation or winding impedance curve as a function of frequency.

As the shape of the curve (defined by the capacitances and inductances) is in strict correlation with the winding geometry, we could be sure, if there is a change in the shape of the curve, there is some change in the winding geometry inside the transformer as well. From the other side, if the measured curve is same as the curve measured last year or earlier we can be sure that there is no winding movement inside the transformer.

TRAFTEK is a measuring instrument that is designed especially for this measurements on site. The TRAFTEK hardware and software construction tries to cover all the swept frequency detection methods (FRA, Winding Impedance etc.) and offers an easy to use, portable equipment for everybody.

Equipped with durable triple coaxial test cable with a single connector to the front side of the equipment and four large clips at the other ends takes it easy to connect to large transformer bushings.

With the built in "Calibrating Network" we can check the accuracy of the equipment and the continuity of the test cable as well.

Specification of TRAFTEK

- 6.4" Color TFT LCD display with backlight (640x480 point)
- Output: Exciting voltage (max. $5V_{RMS}$, 75Ohm)
- Inputs: Voltage input (max $4V_{RMS}$, 75Ohm) normally for the measurement of the exciting voltage.
  Voltage input (max $4V_{RMS}$,75Ohm) normally for the measurement of the voltage on the termination of the winding
- Built in 8MB Flash-Disk capacity for storing results
- Built in PC compatible floppy drive for data storage and transport
- Numeric and cursor keys on the front + 10 keys defined on the display
- Frequency range from 50Hz to 1 MHz
- Calculation of the virtual winding impedance or attenuation, registration of the two voltages and phase
- Selectable number of recorded points (max. 2000 points) and frequency range
- Recording time of a winding is less then 1 minute (depends on the number of points)
- Selectable Linear or Logarithmic sweep mode
- "Tab" delimited ASCII file format easy to import into EXCEL or other programs
- Application software under Windows for displaying, printing and comparing curves
- 20m long measuring cable (triple coax cable) with only one connector on the front

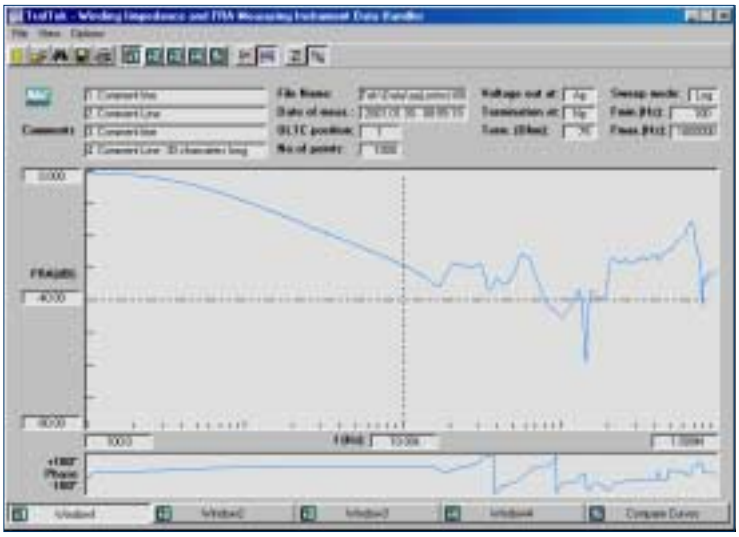
panel, large clips at the ends. Delivered with cable drum.

- Easy, portable device, 85...265V ,50/60Hz AC supply.
- Size: (W x H x D) 370 x 220 x 430 mm
- Weight: Traftek: 10.5kg
  Cable with drum: 6.5kg

Application software

Application software for Windows® 95,98 or NT. It helps evaluating curves comparing them to each other, editing additional data and printing test reports.

We can import Traftek files into the four Window. We can edit comments and parameters, measure the curve with cursors , zoom it simply by clicking the left and right mouse buttons. As the Traftek result file stores the output and input voltages it is possible to select FRA (attenuation in dB) or Z (virtual impedance) display. We have the possibility to change the frequency axis to linear or logarithmic independently of the measurement sweep mode. The colors of the curves within each window is easily definable.



The fifths window is a Compare Window. It behaves like the others but we can select which input windows will be visible in the common curve diagram.

With this window it is easy to compare different results and curves. We can compare the measurements taken on the same winding in different time (Taking a “fingerprint” ,then repeat the measurement yearly to check the state of the winding.) An other way of use is to compare the windings of two transformer of the same type. You can see differences well with the help of zooming. The compare window is also printable.

Option: Winding vibration detection

While FRA methods can detect irreversible winding distortions, vibration detection is sensitive for the looseness of the winding, and the whole transformer.

- Measures vibrations directly from the oil.
- The special hydrophone can be mounted onto the drain valve of the transformer with adapters.
- It can be useful not only for on site transformer test, but during the short circuit test of a new transformer construction.

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