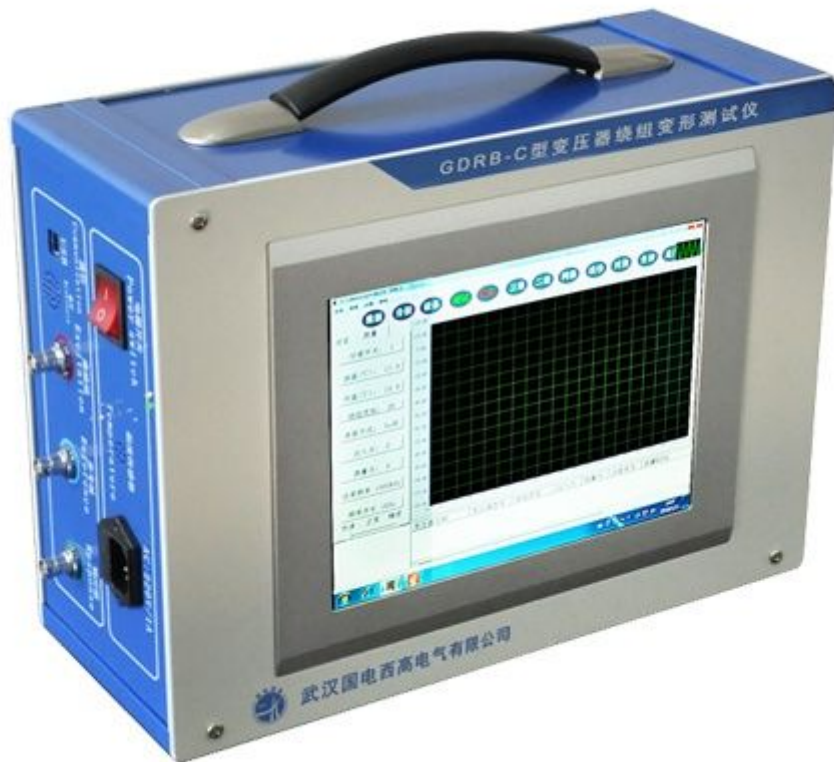




## GDRB-C Transformer Winding Deformation Tester



### Product Description

Power transformer winding deformation tester (frequency response method) is based on the measurement of characteristic parameters of transformer internal windings, adopts the internal fault frequency response analysis (FRA) method, can accurately judge the internal faults of transformers.

After the completion of design and manufacture of transformers, the coils and internal structure are finalized, so for the coil of a multi-winding transformer, if the voltage level and winding method are the same, the corresponding parameters ( $C_i$ ,  $L_i$ ) of each coil shall be determined. Therefore, the frequency characteristics

response of each coil also will be determined, so the frequency spectrums of the corresponding coils of three phases are comparable.

During the test of transformer, in case of inter-turn, inter-phase short circuit, or relative coil displacement caused by collisions during transport, as well as coil deformation resulted from electromagnetic tension during operation under short circuit and fault conditions, the distribution parameters of transformer windings will change, which thereby in turn affects and changes the transformers' original frequency domain characteristics, namely the frequency response change in magnitude and the resonant frequency points shift. The transformer winding tester developed according to the response analysis method is the novel NDT equipment for detecting transformer internal fault. It applies to the detection of internal structure fault in 63kV-500kV power transformers.

Transformer winding deformation tester is to determine the degree of changes in internal windings of the transformer based on the quantity of change, magnitude and region affecting change and tendency of frequency response change which are quantized from the response changes in different frequency domains of transformer's internal winding parameters, and then it can help you determine whether the transformer has been severely damaged, or need a major overhaul in accordance with the measurement results.

For the transformer in operation, no matter whether the frequency domain characteristic drawing is saved, by comparing the differences between the inter-coil characteristic spectra of faulted transformer, it can determine the extent of the failure as well. Of course, if you have saved the original transformer windings feature drawings, it will be simpler to provide a precise basis for operating conditions, post-fault analysis and maintenance overhaul of the transformer.

Transformer winding deformation tester is constituted by a laptop computer and micro controller forming a precision measurement system with the compact structure, easy operation, with more complete test analysis function, which can be operated referring to the instruction manual or through short-term training.

## **Features**

1. Acquisition and control using high-speed, highly integrated microprocessor.
2. Communication USB interface used between the laptop and instrument.
3. It is not necessary to use mobile computer in the measurement field because of the integration of industrial computer and measuring instrument.
4. Hardware adopts dedicated DDS digital high-speed scanning technology (USA), which can accurately diagnose the faults like winding distorted, bulged, shift, tilt, inter-turn short-circuit deformation and inter-phase contact short-circuit.
5. High-speed dual-channel 16-bit A/D sampling (in field test, move tap changer, and the wave curve shows obvious changes) .
6. Signal output amplitude is adjusted by software, and the peak value of amplitude is  $\pm 10V$ .
7. The computer will automatically analyze the test results and generate electronic documents (Word).
8. The instrument has dual measurement features: linear frequency scanning measurement and segment frequency scanning measurement, compatible with measurement mode of two technical groups in China
9. The amplitude-frequency characteristics are in line with the national technical specifications on amplitude-frequency characteristics tester. X-coordinate (frequency) has linear indexing and logarithmic indexing, so the user can print out the curve with linear indexing and logarithmic indexing. The user can choose either according to actual needs.

10. Automatic test data analysis system,

Horizontal comparison of winding similarity between three phases A, B and C

- 1) The results are as follows:
- 2) Excellent consistency
- 3) Good consistency
- 4) Poor consistency
- 5) Worse consistency

Longitudinal comparison A-A, B-B, C-C calls the original data and the current data in the same phase for winding deformation comparison

The analysis results are:

- 1) Normal winding
- 2) Mild deformation
- 3) Moderate deformation
- 4) Severe deformation

11. Word electronic document can be automatically generated for saving and printing.

12. The instrument can fully meet the technical requirements of electricity standard DL/T911-2004 *Frequency Response Analysis on Winding Deformation of Power Transformers*.

## **Specifications**

### **Scan mode:**

1. Linear scanning distribution Scanning measurement range: (10Hz) - (10MHz) 40000 scanning point, resolution 0.25kHz, 0.5kHz and 1kHz.
2. Segment frequency scanning measurement distribution Frequency scanning measurement range: (0.5kHz) - (1MHz), 2000 scanning points; (0.5kHz) - (10kHz) (10kHz) - (100kHz) (100kHz) - (500kHz) (500kHz) - (1000kHz)

**Other technical parameters:**

Amplitude measurement range	(-120dB) to (+20 dB)
Amplitude measurement accuracy	0.1dB
Scanning frequency accuracy	0.01%
Signal input impedance	1M $\Omega$
Signal output impedance	50 $\Omega$
Signal output amplitude	$\pm$ 20V
In-phase test repetition rate	99.9%
Measuring instruments dimensions (L*W*H)	300*340*120 (mm)
Instrument's aluminum box dimension (L*W*H)	310*400*330 (mm)
Overall weight	10kg
Working temperature	-10°C~+40°C
Storage temperature	-20°C~+70°C
Relative humidity	<90%, Non-condensing