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Custom engineering
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Find the *ECG-Kokusai DWX-01* at our website: ***Click HERE***

ECG-KOKUSAI

The Cutting Edge Winding Test Technology

Impulse Winding Tester

DWX Series

- **DWX-01**.....1000V
- **DWX-05**..... 5000V
- **DWX-10**..... 10000V



An Innovative Design for Low Inductance Coil!

Your New Solution: Clear Waveform Display of 10 µH Coil

- This state-of-the-art tester offers a new solution for low inductance coil test.
- Its advanced technology enhances a complete waveform and partial discharge observation ability by the resistive voltage divider.
- Its high sampling rate of 100 MHz delivers highly sensitive and precise test.
- The partial discharge amount calculated by the Laplacian method is displayed clearly in a separate sub-window.

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DWX Series Features

This innovative tester offers a new solution for low inductance coil test.

With the advanced requirement of miniaturization and high frequency technology of coil production, the DWX tester is designed to test other coils and low inductance coils used in high-end electronic components. Through the use of impulse power source with high-speed switch, highly efficient input circuit, and high-speed A/D sampling circuit, the DWX tester can offer a new solution to the low inductance coil tests.

Its advanced technology allows a complete waveform and partial discharge observation by the resistive voltage divider.

The high performance voltage divider allows the DWX input circuit of impulse waveform to generate a complete wave pattern without any distortion. At the same time, it also helps improve the partial discharge sensitivity and detection capability (The DWX's detection sensitivity is improved compared with that of our DW & DWS series, except for the DW-9505F).

Its high sampling rate of 100 MHz delivers highly sensitive and precise test.

Its high-speed A/D sampling helps to verify the extremely short impulse response of the low inductance coil. At the same time, the 8 kByte sampling, with highly refined data analysis, can precisely capture the subtle difference in the wave patterns.

The partial discharge amount calculated by the Laplacian method is displayed clearly in a separate sub-window.

The employed Laplacian method calculates the partial discharge (PD) generated by high voltage impulse. This PD, abstracted from the voltage wave, visually displays a bar graph in a separate sub-window, offering an easy and comfortable viewing.

The 8.4-inch color TFT LCD screen clearly displays the waveform and is easy to view.

A combination of our proven Area, Dif-Area and Flutter comparison methods can be selected to perform the layer short test.

All types of coils can be evaluated by choosing a combination of various test methods: Area Size Comparison, Differential Area Size Comparison, Flutter Value (Corona Discharge) Detection, and Laplacian Value (Corona Discharge) Detection.
(* The Flutter Value Detection and the Laplacian Value Detection can only be selected alternatively.)

The equipped compact flash memory device offers an unlimited memory of the master data.

Printing of the screen hard copy can be made easily through the Centronics printer port.

With the Centronics printer port, a screen hard copy can be printed easily by an ESC/P printer with ESC/P format.

Various operations become much easier with the rotary dial and the menu display through the icon button.

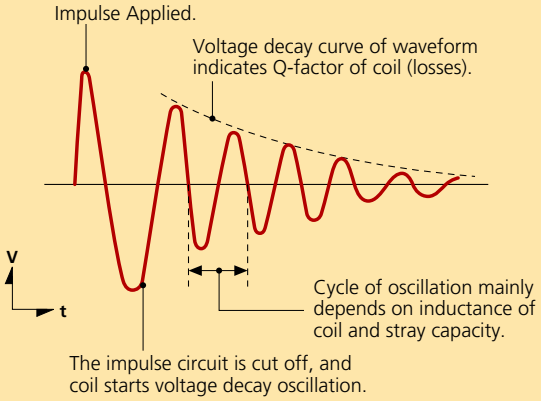
The optional Ethernet adaptor enables the DWX's remote control operation through LAN connection.

The remote control operation by PC, through the use of peripheral devices like the RS-232C port and LAN port (optional), can provide management of master data, test data and results.

The DWX unit is compact, durable and weighs only 10 kg.

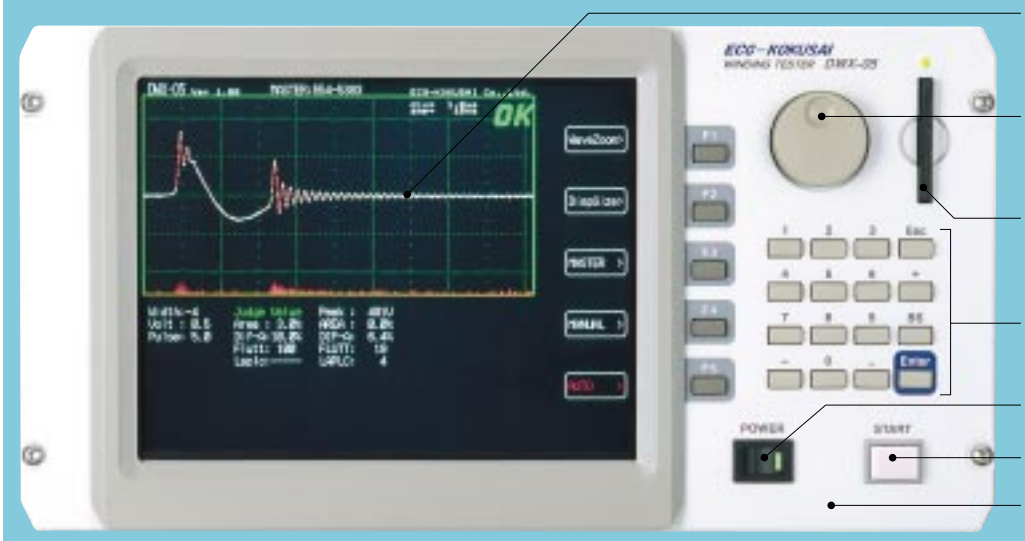
With our thorough research attempts, this high-end tester contains a great design of smaller circuits. Compact and light, the DWX is suitable for coil testing in limited space like designing or maintenance site, workbench, R&D and quality control fields.

HOW DOES THE IMPULSE WINDING TESTER WORK?



The impulse coil-winding tester tests the electrical characteristics of coil winding without damaging the sample. The prerequisite conditions for quality of a coil can be detected at just a glance. The detection is carried out when the same electric impulse by capacitor discharge is applied to the master and the test coils. The voltage decay waveform is generated in response to the impulse, related to the Q-factor and inductance (impedance) of the coil. In this sense, the tester can detect turn & layer short, the differences in the number of turns and the material of the core. If high impulse voltage is applied, the poor insulation will appear as a corona or layer discharge.

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The 8.4-inch Color TFT LCD Screen
The master and test waves, displayed in color, can be observed at just a glance.

Rotary Dial
Allows menu switching, setting of the sampling and test range, and other operations.

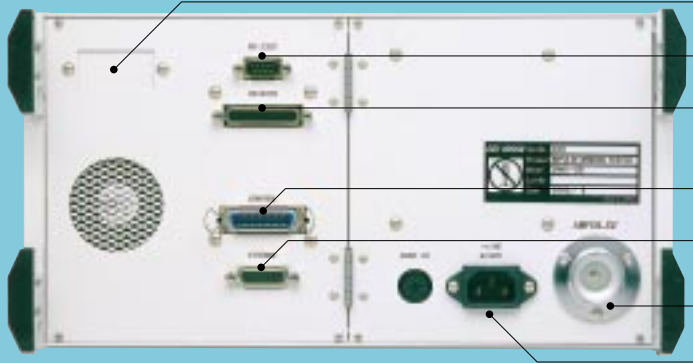
Compact Flash Memory Card Slot
The widely available memory cards help to extend data memory.

Function Keys, Numeral Keys

Power Switch

Start Switch

Compact and Durable Body with a Handle
enables coil testing in the field.



The Optional Ethernet Installing Slot

RS-232C (9 Pins)

Printer Port (25 Pins)

I/O Parallel (24 Pins)

Special External Port (15 Pins)

Impulse Output

AC Line In

1. AREA SIZE COMPARISON

This compares each area size of the master coil and the sample coil waveforms in the intentionally determined zone. In **Fig. 1**, the area size is calculated between 'a' and 'b', and OK/NG (Pass/Fail) is determined by comparing the area size (i.e. what percent (%) the sample waveform's area size differs from that of the master waveform). The detecting criterion is set by %. When the result is within the set value in %, the test coil is considered to be "OK". The area size of the wave is nearly proportional to the energy loss in the coil; therefore, the test coil is considered to be OK/NG by the amount of its energy loss. For example, when a sample coil layer has a short circuit, the short circuit area is reflected as an increase of energy loss.

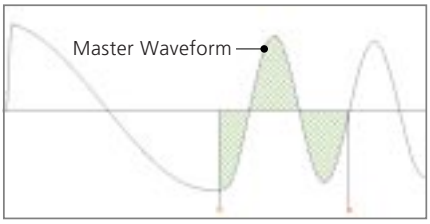


Fig. 1

2. DIFFERENTIAL AREA COMPARISON

This calculates the area size of differential portion between the master coil and the sample coil waveforms in the intentionally determined zone. In **Fig. 2**, the differential area size is calculated between 'a' and 'b', and OK/NG is judged by detecting how large the differential area size is. The detecting criterion is set by %. When the result is within the set value in %, it is considered to be "OK". The differential area size represents the L value and total energy loss. This method is especially effective, for example, when the change of the L value causes major problems.

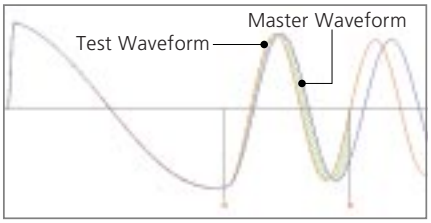


Fig. 2

3. CORONA DISCHARGE (FLUTTER VALUE) DETECTION

Regardless of the difference in waveforms, this method only detects the high frequency energy of corona discharge as shown in **Fig. 3**. It detects the corona value in the intentionally determined zone of the waveform, and judges OK/NG by the corona evaluation value. The detecting criterion is set by an integer. The result that appears within the range is considered to be "OK". The wave is converted by derivative calculation and its area size is calculated. In an equivalent analog circuit, the energy value of the wave that passes through high pass filter is measured.

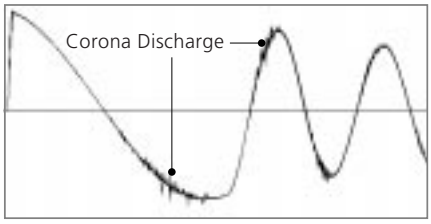


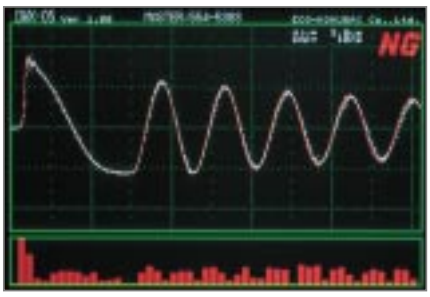
Fig. 3

4. CORONA DISCHARGE (LAPLACIAN VALUE) DETECTION

The Laplacian is a method in digital filter processing used for detecting the edge intensity of an image. In the application to the Flutter Value, it measures the 2nd derivative of the image to find and extract the partial discharge. The discontinuity of the value hidden in the wave data (noise) can be digitized, offering an easier detection of the partial discharge (**Fig. 4**).

5. VISUAL COMPARISON

The superimposed master and sample waves are displayed on the screen. This allows an easy observation of the differences in characteristics of the two coils.


Fig. 4

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DWX Series Specifications

	DWX-01	DWX-05	DWX-10
Applied Voltage, Step, and Energy * At 1 kOhm Resistive Load	50V - 1000V (10V Step) Max 5 milli-Joule	500V - 5,000V (100V Step) Max 0.12 Joules	1,000V - 10,000V (200V Step) Max 0.5 Joules
Inductance Test Range	More than 10µH	More than 10µH	More than 50µH
Sampling Speed	8 bit / 10 nano-sec. (100MHz)		
Sampling Memory	8192-Byte		
Sampling Range	10 Ranges: -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 (Width 0 to 5 is the Compatible Range with the DW Series)		
Input Test Circuit (Impedance)	Resistive Voltage Divider (5 MOhm)		
Screen Display Resolution Waveform Display Range	640 x 480 Dots (VGA), 8.4" TFT Color LCD, 4 Color Display 512 x 256 Dots		
Detection Mode	Master Waveform Comparison Detection by Area Size Comparison, Differential Area Comparison, and Corona Discharge		
Master Waveform Memory	Internal Memory: 42 Types (14 Types per Page, 3 Pages) 700-Types by Compact Flash Memory (14 Types/50 Pages)		
External Interface	Parallel I/O (Start, Reset, OK, NG, Busy, Master Numbers, etc.) RS-232C (Test Control, Test Data, etc.) Printer Port (Screen Hard Copy) Ethernet Adapter (Option)		
Accessories	A Test Cable (1.5 m) A Power Cable (With 3P Adaptor) A Compact Flash Memory A Parallel I/O Connector An Instruction Manual and Inspection Record		
Environmental Conditions	0˚C-40˚C, AC Voltage Upon Your Request: 100V - 240V ±5%		
Dimension (Excluding the Handle) / Weight	345(W)x185(H)x370(D), Approx.10 kg		345(W)x325(H)x370(D)

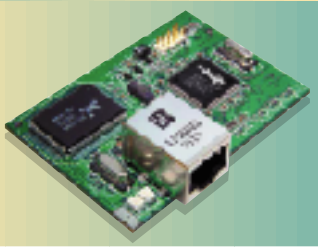
DWX Series Option

Ethernet Adaptor

The DWX can be remotely controlled and operated through the Ethernet network and TCP/IP serial convert adaptor. The available control software (DW-Assis Win) helps to operate the data from the PC's Windows.

LAN Interface: 10 BASE-T 1 Port

Correspond Protocol: TCP/IP Ethernet



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