

ECG-KOKUSAI CO., LTD.

Impulse Winding Tester

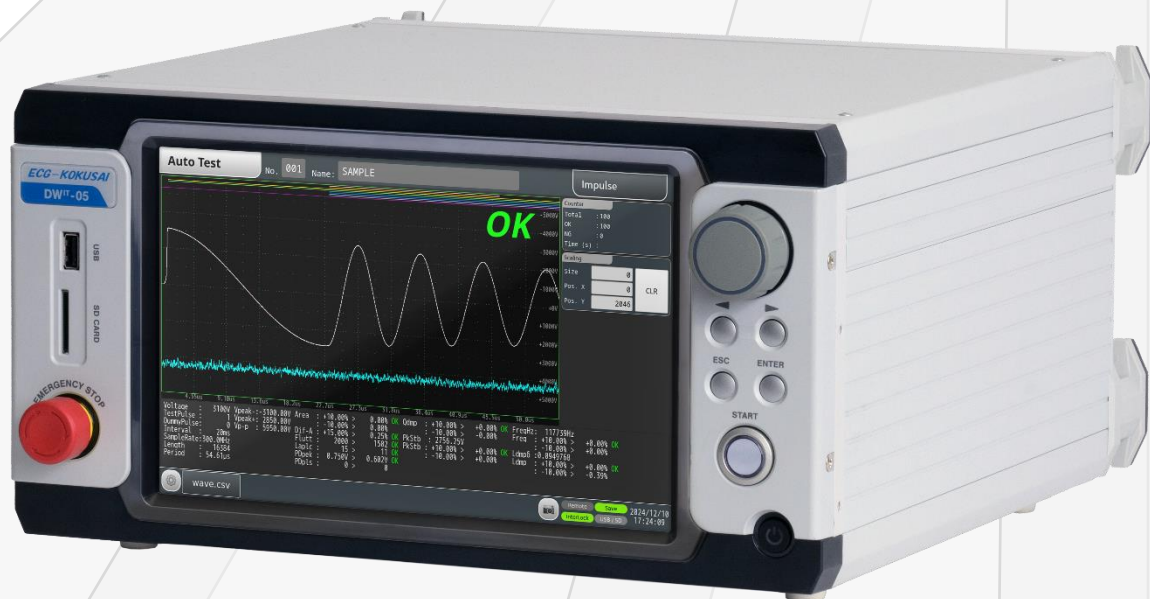
DWIT Series

DWIT-05

DWIT-05PD

Standard model

Models with partial discharge detection antenna



- ◆ 12-bit resolution × 300 MHz sampling
- ◆ New judgment items based on self- resonant waveform
- ◆ Impulse continuous application mode
- ◆ Visualize the inspection process through database management.
- ◆ Wide range of additional options

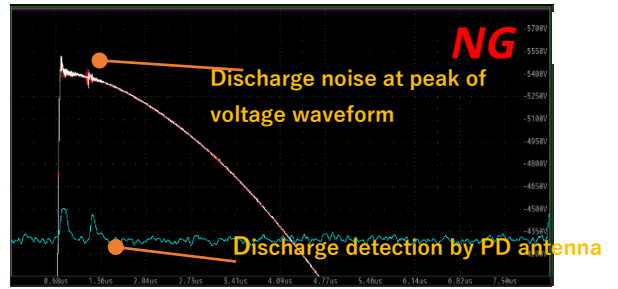
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Features of the DWIT Series

The DWIT series inherits the technology, performance, and reliability of the "DWX series" impulse winding testers and pursues further performance improvement. It is a new impulse winding tester with high accuracy, a wide variety of functions, diverse expandability, improved operability, and enhanced external communication interfaces.

12bit resolution × 300MHz sampling

High-resolution, high-speed sampling ADC circuitry allows for high-definition waveform capture. With a maximum of 16,384 points, waveform disturbances and partial discharge noise can be reliably captured, and the waveform can be enlarged and displayed after testing. The cursor allows for confirmation of the waveform rise time, pulse width, and peak voltage.



◆ Visualizing the inspection process through database management

The master waveform, judgment conditions, and test results (test waveforms and judgment values) are stored in a built-in database, which can be viewed remotely from a PC using SQL client software. Test results can be searched by pass/fail and by date, which is useful for analyzing NG occurrence rates, etc.

◆ A wide range of additional options

PD (partial discharge) detection antenna / 3ch + GND built-in switching circuit / 4-terminal measurement circuit / additional applied energy / current measurement, and many other additional functions (※Some options cannot be combined.)

◆ Useful Features

- 10.1 inch color TFT LCD touch panel for improved operability.
- External memory (USB, SD) storage of screenshots.
- Creation of master waveforms by averaging/combining/test waveforms.

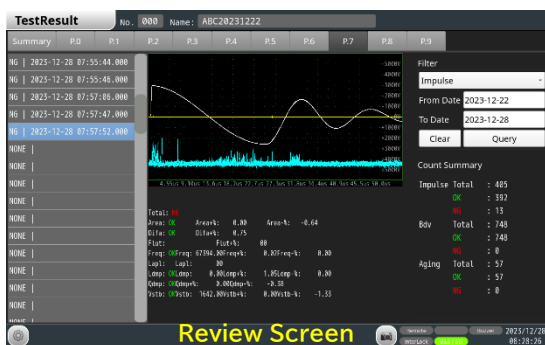
New mode

■ Aging Test (Continuous Application) Mode

This mode is equipped with continuous application function for an arbitrary time or number of times. This function is used to evaluate the degradation of a sample due to the continuous application of impulse voltage for a long period of time. By adding an optional PD sensor, the time (number of times) until discharge occurs can be observed.

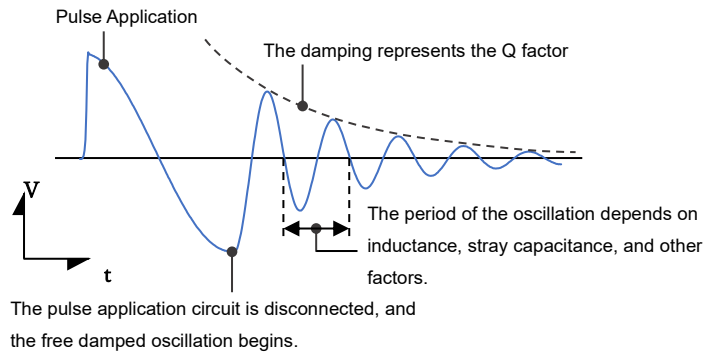
■ Test Result (view test results) mode.

The numerical values of the test results are stored in the unit's memory. The number of times the test item was judged OK, NG or NG is also displayed in graphs and numerical values. In addition, the test screens of the last 1000 impulse tests can be saved and reviewed.



Overview of impulse winding testers

Impulse winding testers efficiently and non-destructively carry out electrical tests on test objects in their wound state. The principle is that an impulse voltage is applied to the reference winding (master coil) and the winding under test (test object), and the transient waveforms are compared to determine whether the test is successful or not. The transient waveforms, i.e. the damped vibration waveforms generated in the coil, mean the inductance and Q value, and the number of coil turns, layer shorts and core material differences can be determined at the same time. Furthermore, by applying a high impulse voltage, insulation faults can be detected from the occurrence of corona discharges. In other words, most of the characteristics required for winding quality can be tested in an extremely short time.



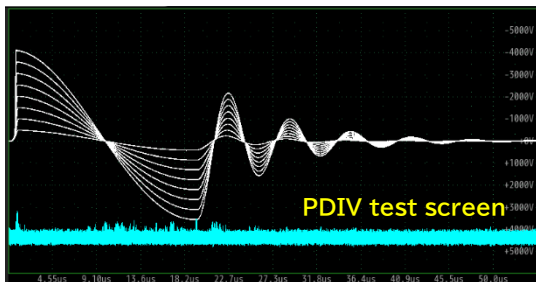
Existing judgment items

Improved resolution, sampling frequency, and number of samples allow for even more precise measurements.

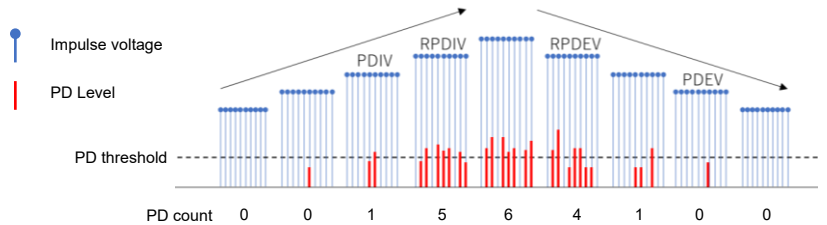
Area judgment	Dif-Area judgment	Laplacian judgment
Area comparison judgment compare the area of the resonance waveform	Area difference comparison judgment Compare the difference in area with the master waveform	Laplacian judgment Measuring sudden changes in waveforms

Breakdown Voltage Test

The BDV test mode is standard, which automatically increases the applied voltage while searching for the breakdown voltage.



By adding the optional PD antenna, partial discharge tests in accordance with the IEC60034-18-41 and IEC61934 standards for PDIV test (partial discharge initiation voltage), RPDIV test (repeated partial discharge initiation voltage), PDEV test (partial discharge extinction voltage) and RPDEV test (repeated partial discharge extinction voltage) can be performed. Partial discharge tests can be carried out in accordance with the IEC60034-18-41 and IEC61934 standards.



New test items added!

Introducing new indicators that indicate the characteristics of the test object, and measuring actual values

Frequency judgment

Judgment based on resonant frequency f

The period of the self-resonant waveform is measured and the frequency is calculated from the average. Frequency changes occur due to changes in the impedance and capacitance components of the test object, or losses.

Logarithmic decrement judgment

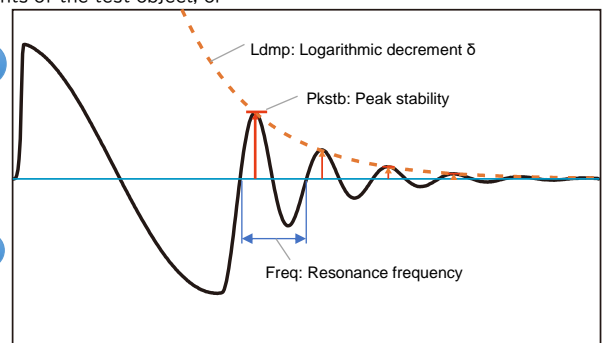
Judgment by logarithmic attenuation rate σ

The amplitude of the self-resonant waveform is measured, and the logarithmic attenuation rate is calculated from the average. Changes in the inductance and capacitance of the test subject, or losses, will cause changes in the attenuation of the

Peak stability judgment

Judgment based on the peak voltage V of the resonant waveform

The amplitude strength is measured from the peak voltage value of the self-resonant waveform. The peak voltage changes due to waveform distortion and disturbance caused by discharge, so the loss occurring in the test object is reflected.



Introduction of additional options

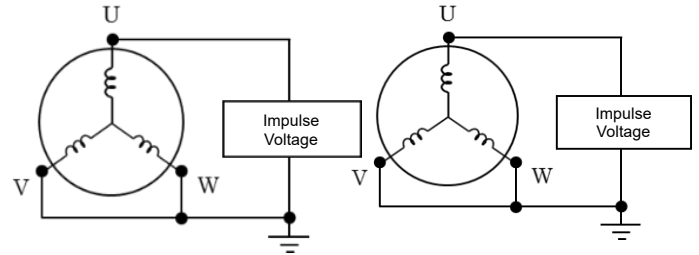
● Partial Discharge Detection Antenna
Supports PD (partial discharge) testing using microwave patch antennas (shown at right). In addition to impulse PD testing, PDIV and PDEV testing can also be performed.



● Applied Energy Increase
B Low-impedance coils such as the flat wire coils of BEV and HEV motors may not allow the applied voltage to rise sufficiently for impulse testing. As a countermeasure, we have prepared a C2 modification option that doubles the power of the high-voltage output circuit of the testing machine.

● 3CH + GND circuit switching function (under development)

High-voltage relay is built in for testing 3-phase coils and can be switched for testing. There are 3 lead wires and 1 GND wire, and the connections shown below can be set arbitrarily according to IEC standards such as U-VW and V-WUGND.



Specifications

Applied voltage / Energy	100-5000V · 0.12J	
Voltage Accuracy	±5.0%	
Applied step	1V	
Inductance range	5μ-1H	
Resolution / Sampling speed	12bit / Max. 300MHz (20 steps)	
Sampling data	16384, 8192, 4096, 2048, 1024, 512	
Screen Display	10.1" color TFT LCD (1280 x 800 (WXGA)) touch panel	
Test mode	Impulse Test, BDV (PDIV) Test, Aging Test (NEW)	
Judgment item	Existing Judgment	Area(Area comparison) Dif-Area(Waveform difference comparison) Flutter(Discharge comparison) Laplacian(Discharge comparison)
	Judgment (New)	Pkstb(Peak Voltage) Freq(Resonant Frequency) Ldec(Logarithmic Decay Rate)
	Partial discharge judgment *Option	PD Level(electromagnetic wave intensity) PD Count(number of occurrences) *Model: DWIT-05PD
Safety Protection Functions	Emergency Stop Button, Interlock	
Internal Memory	Master waveforms for 1000 models (100 models/10 pages), test results and voltage waveforms (csv), screenshots (png)	
External interface	RS-232C (max. 115,200bps)	
	Control (NPN/PNP transistor (changeover by wiring), D-sub 37pin)	
	Ethernet communication (1000BASE-T), protocol (TCP/IP)	
	USB2.0 host (max. 3Mbps)	
	Trigger output (impulse voltage applied synchronous signal output)	
External Storage	USB memory (2 ports), SD card, SDHC card (max. 32GB)	
Operating Environment	0°C to 40°C, 80%RH (non-condensing)	
Input power supply	AC100 ~ 240V, 50Hz/60Hz	
Dimensions and Weight	342(W)×188(H)×366(D) (*not including protruding parts) · Approx. 9.8kg	
Accessories	Test cable, power cable (A type, with 3-pin adapter), fuse, operation manual, test report	

● Additional Options

Ch + GND switching circuit	Built-in test circuit switching for 3-phase coil U, V, W, and GND, and can be set as desired, supports testing of circuits recommended by IEC standards. (under development)
PD detection circuit	Partial discharge electromagnetic wave detection by PD antenna (microwave patch antenna) *Model: DWIT-05PD Discharge current detection by current measurement circuit (under development)
4-terminal test circuit	Separates the voltage application and measurement circuits to more accurately measure the voltage at both ends of the coil. (under development)
Charging capacitor change	The charging capacitor capacity has been doubled, increasing output energy and providing a measure for samples that are difficult to voltage.
Carrying handle	Used for carrying and placing upward. (Not included as standard).
Rack mount	Can be mounted in a 19-inch rack.

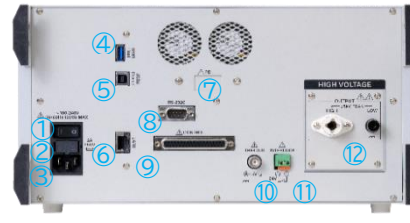
Exterior

Front side



- ① Color touch panel LCD
- ② Dial
- ③ Operation buttons (left/right, ESC, ENTER)
- ④ START button
- ⑤ Start/Stop button
- ⑥ Emergency stop button
- ⑦ USB memory/SD card

Back side



- ① Main power switch
- ② Fuse holder
- ③ AC receptacle
- ④ USB memory
- ⑤ USB device
- ⑥ Ethernet
- ⑦ PD amplifier unit *Option
- ⑧ RS-232C
- ⑨ Control
- ⑩ Trigger output
- ⑪ Interlock
- ⑫ Impulse output

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