SOKEN

ELECTRIC STEEL SHEET TESTER

DAC-BHW-6

For testing Oriented and non-oriented core in sheet

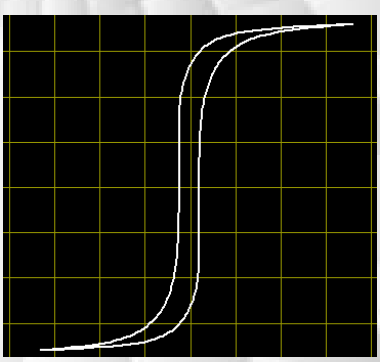
DAC-BHW-6 is a single strip tester (SST) to test magnetic characteristics of electromagnetic steel sheets. The tester is suitable to confirm quality as well as to analyze characteristics of your steel sheets with a simple operation.

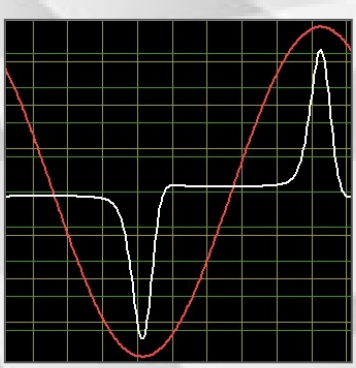
Features

- Magnetic flux sine wave even in high magnetic flux density field.
- Measurement at frequency of 50, 60, 100, 200 and 400Hz.
- Closely coincident results with data obtained by Epstein Method.
- No influence by gaps in magnetic path by introducing the original magnetic circuit.
- Easy and simple operation from LCD touch screen.
- Compact and light weight.

Software

- B-H curve observation in a PC.
- Overlay B-H curves of max 8 test data.
- Auto sample testing.
- Various graphs processing and data analysis.
- Discrimination graph of Iron loss to see eddy current loss and hysteresis loss separately.





DAC-BHW-6 controls the magnetic flux sine wave even in high magnetic flux density field. (Form Factor 1.11).
By using software, you can observe B-H curve in a PC and save the data in csv format.

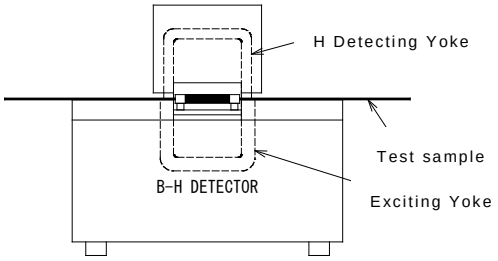
SOKEN ELECTRIC CO., LTD.

Model DAC-BHW-6
ELECTRIC STEEL SHEET TESTER

Advantages

Apply Magnetic Potentiometer Method into the Magnetic circuit

The Steel Sheet Tester Model DAC-BHW-6 is capable of measuring magnetic flux density (B), magnetizing force (H) and core loss (W) of an electromagnetic steel sheet (a single strip sheet).
The measuring method of DAC-BHW-6 differs from the conventional Single Sheet Test (SST) of IEC in that it applies the Magnetic Potentiometer method into the magnetic circuit. The tester measures a magnetic potential between 2 points in magnetic field. In this style, stable and reliable measurement is possible because the measurement is unaffected by a gap between a test sample and a detecting yoke.
Combining an external measuring detector and a built-in power source, DAC-BHW-6 provides 2 measuring mode, B mode and H mode.
In B mode, using magnetic flux density (B) as a parameter, magnetizing force (H) and core loss (W) are measured. In H mode, using magnetizing force (H) as a parameter, magnetic flux density (B) and core loss (W) are measured.
DAC-BHW-6 is calibrated on bases of the values measured by EPSTEIN, and the test results are closely coincident with data obtained by EPSTEIN Method. When variations in data of sample points are large, you ought to measure as many points as possible and get a mean value. Then, you can obtain better results in correlation between DAC-BHW-6 and EPSTEIN.
With PC software, a hysterics curve is drawn in a PC, and the data can be saved and recalled for the further analysis.

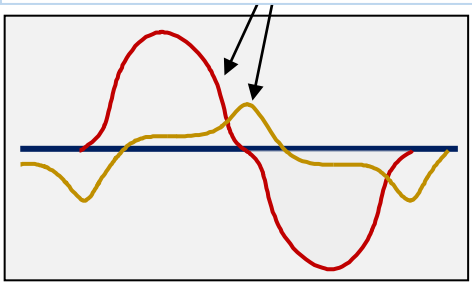


Test sample is excited by Exciting Yoke. Because H Detecting Yoke is designed to have zero magnetic flux, magnetic resistance between the sample and Detecting Yoke does not effect in the measuring results.

Controlled magnetic flux sine wave

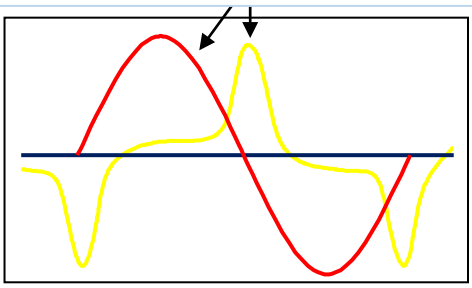
DAC-BHW-6 controls Magnetic Flux in a test sample so that it always forms sine wave without causing waveform distortion.

Due to waveform distortion, the peak excitation current will not flow

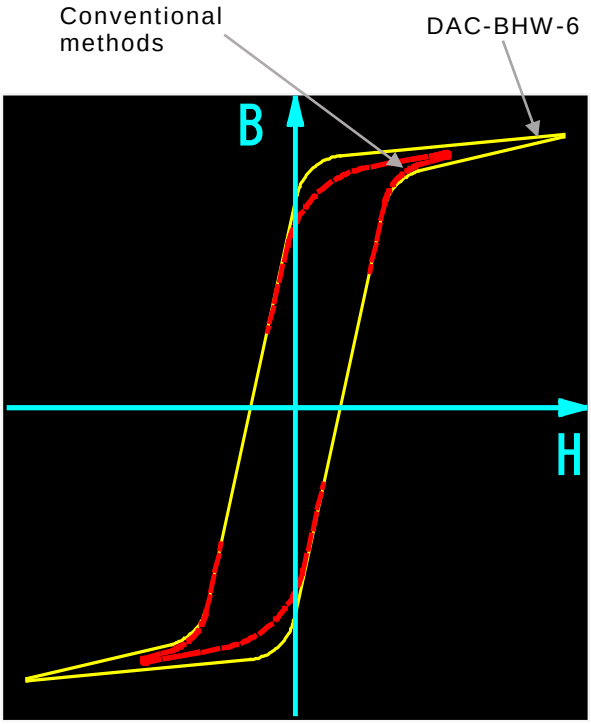


Waveform of conventional methods

DAC-BHW-6 controls the magnetic flux sine wave (Form factor 1.11). The peak excitation current can be observed.



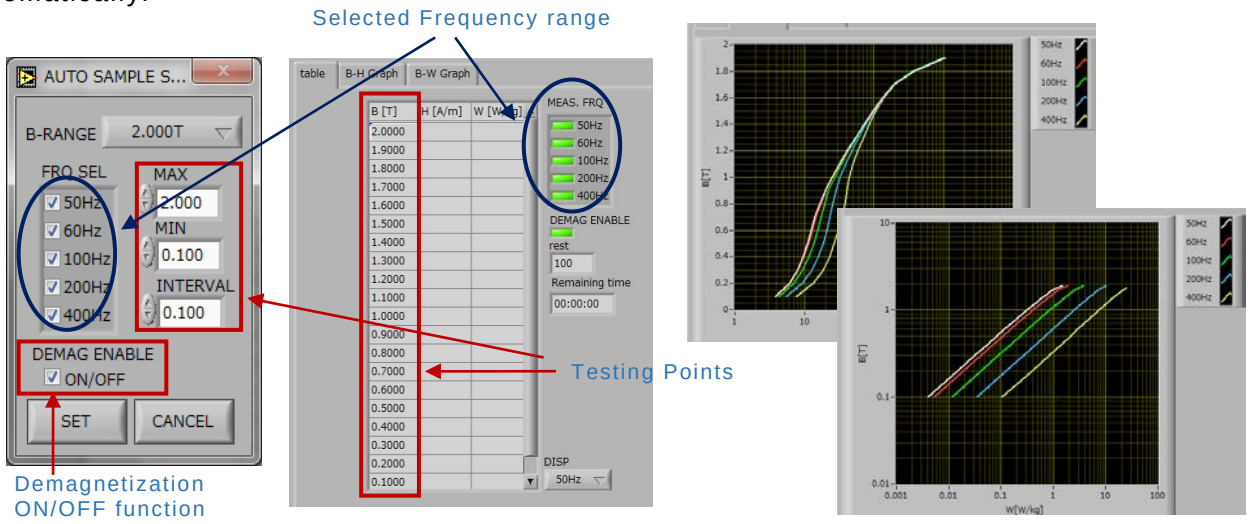
Waveform of DAC-BHW-6



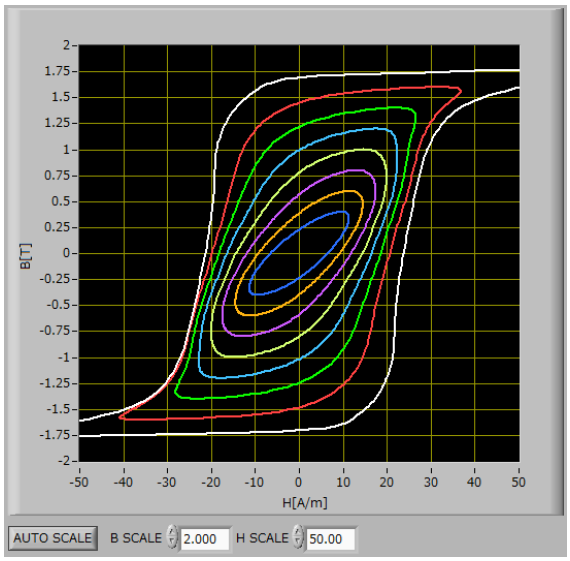
Software applications

Auto Sample (B-MODE)

In Auto Sample Mode, B-H Graph and B-W Graph of each frequency ranges are created automatically.



Overlay the B-H curves of max 8 test data

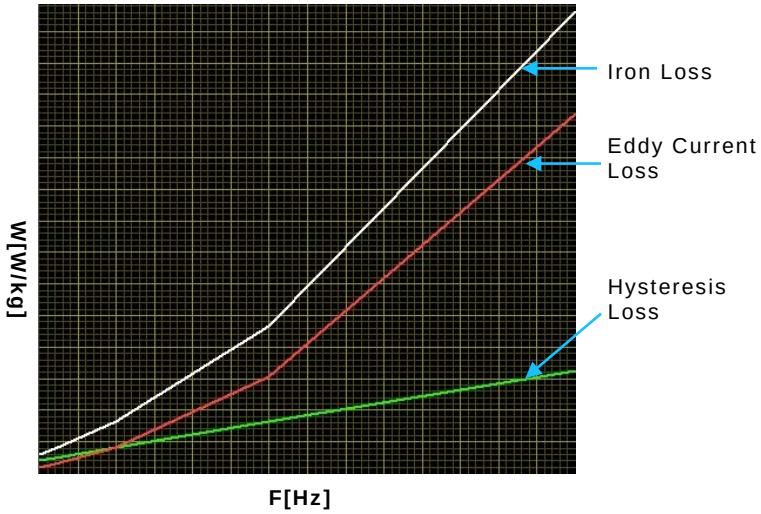


You can choose Max 8 data from the stored csv files, and create overlay-graph of B-H curves. Associated information of test conditions will be displayed in a list for easy comparison, and the group data can be saved in .dat format.

	Data 1	Data 2	Data 3
	B-DISP	H-DISP	W-DISP
Plot0	1.800[T]	131.3[A/m]	1.128[W/kg]
Plot1	1.600[T]	38.8[A/m]	0.795[W/kg]
Plot2	1.400[T]	27.3[A/m]	0.589[W/kg]
Plot3	1.200[T]	22.6[A/m]	0.430[W/kg]
Plot4	1.000[T]	20.00[A/m]	0.300[W/kg]
Plot5	0.800[T]	17.46[A/m]	194.8[mW/kg]
Plot6	0.600[T]	14.50[A/m]	112.2[mW/kg]
Plot7	0.400[T]	11.33[A/m]	52.4[mW/kg]

W Discrimination Graph

Approximate values of Eddy current loss and Hysteresis loss are calculated and observed in a graph separately.

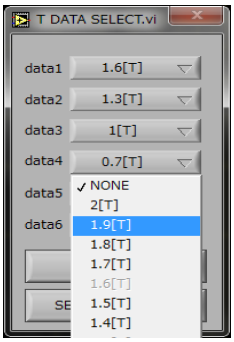


Point:
Iron loss is mostly expressed as a sum of hysteresis loss and eddy current loss.
Normally, as frequency becomes higher, the percentage of eddy current loss in iron loss becomes larger. Knowing characteristics of iron loss in details is helpful in evaluating the quality of the steel sheet as well as designing it to minimize energy loss.

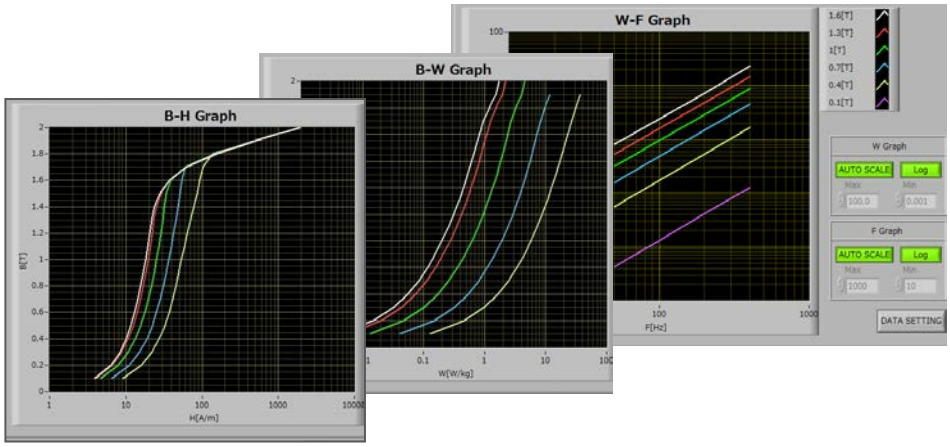
Other Graphs

The various graphs enable you to further analyze the characteristics of your samples.

TABLE | B-H Graph | B-W Graph | W-F Graph | μ-F Graph | W Discrimination



Max 6 of magnetic Flux Density can be selected.



Specifications

Magnetization Condition	Sinusoidal flux condition			
Specimen size	Coil type	D1	D2	D3(option)
	Thickness(mm)	0.100-1.000	0.100-1.000	0.100-2.000
	Width(mm)	10.0-50.0	10.0-100.0	10.0-50.0
	Length(mm)	60.00 or longer		
Measuring range	Magnetic Flux Density	0 – 2.000T		
	Magnetizing Force	0 – 5000A/m		
	Core Loss	0 – 200.0 W/kg		
Minimum resolution	Magnetic Flux Density	0.1mT		
	Magnetizing Force	0.01A/m		
	Core Loss	0.001mW/kg		
Measuring accuracy (electrically calibration)	Magnetic Flux Density	±(3%rdg +0.1%F.S)		
	Magnetizing Force	±(3%rdg +0.1%F.S) ±(3%rdg + 1%F.S) at 20.00A/m range		
	Core Loss	±(3%rdg +0.1%F.S)		
Measuring Frequency	50Hz, 60Hz, 100Hz, 200Hz, 400Hz			
Interface	USB			
AC input	100V-240V ±10% 50/60Hz			
Size and weight	Main unit	W430xH198xD380 mm, 11kg		
	BH Detector	W177xH270xD213 mm, 4kg		
Standard Accessory	BH Detector, Detecting coil D1 and D2, Connecting cable, AC cord, Operating manual, Software			

REMARKS:

To ensure accuracy in testing electrical steel sheets, prepare and measure test samples as shown below.
1) Appropriate test sample size is width of 30mm and length of 60mm or more, and it must be cut using a typical shearing machine (warping of 20μ or less, shear angle of 1°)
2) For grain-oriented cores, anneal it in the way recommended by the steel manufacturer.
3) Test samples must be without warp or twist.
4) Measure several test samples, and take the average.
5) Especially at very low magnetic field measurement, uncertainties of magnetic material's nature should be considered.

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