

M5200



M5200 SWEEP FREQUENCY RESPONSE ANALYZER (SFRA)

A tool for detecting “hidden” transformer faults

The M5200 detects mechanical failure or movement of windings due to short circuits, mechanical stresses or transportation. Use it to ensure transformer performance, reduce maintenance cost, and increase the service life of transformers.

A major advance in transformer condition analysis.

The M5200 uses Sweep Frequency Response Analysis, a proven technique for making accurate and repeatable measurements. Pioneered by Doble the sweep approach has become the industry standard and is the preferred method for making frequency domain measurements.

Here's how SFRA works: The M5200 sends an excitation signal into the transformer and measures the returning signals across a broad frequency range. By comparing this response to baseline and other results (such as from similar units), you can identify deviations and confirm internal mechanical problems.

DIAGNOSE problems early.

PREVENT expensive equipment failures.

Take **CONTROL**.

Why wait for problems to develop? With the M5200's non-intrusive test technique, you can test your power apparatus any time you suspect a problem. Or just use it as part of your regular maintenance program. Either way, you identify problems before they lead to failure, such as:

- Core movement
- Winding deformation and displacement
- Faulty core grounds
- Partial winding collapse
- Hoop buckling
- Broken or loosened clamping structures
- Shorted turns and open windings

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Sweep Frequency Response Analyzer (SFRA) For Transformer Core & Winding Movement Diagnosis.

TOGETHER WE POWER THE WORLD



M5200 SFRA

Technical Specifications

Excitation Source:

Channels: 1
Frequency Range: 10 Hz – 25 MHz
Output Voltage: 20 V peak-to-peak at 50 Ohms
Output Protection: Short circuit protected
Source Impedance: 50 Ohms
Calibration Interval: 2 years

Measurement Channels:

Channels: 2
Sampling: Simultaneous
Frequency Range: 10 Hz – 25 MHz
Max. Sampling rate: 100 MS/s
Input Impedance: 50 Ohms
Calibration Interval: 2 years

Data Collection:

Test Method: Sweep Frequency
PC Communication: USB/Ethernet
Frequency Range: 10 Hz – 25 MHz
Number of Points: 1000 points (Default)
Up to 1800 points (Extended Range)
Point Spacing: 1.2 % Logarithmic
Dynamic Range: >90 dB
Repeatability: ± 1 dB to -80 dB
IF Bandwidth: < 10% of active frequency

Data Display:

Scaling: Linear/Log
Frequency Range: 10 Hz – 25 MHz, user defined within frequency range
Plotting: Frequency vs. Magnitude / Phase

Analysis: Difference, Sub-band Cross-Correlation

Physical Specifications:

Dimensions: 10.0 H x 16.0 W x 15.5 D inch
25.4 H x 40.6 W x 39.4 D cm
Weight: 9 lbs (4 kg)
Power Supply: 100-240V AC
Temperature: 0° to 50° C operating, -25° to + 70° C storage
Relative Humidity: 0% to 95 % non condensing

Test Leads Construction:

Integrated three lead system in single cable set
Standard (362 kV and below): 60 ft/ 18 m
Optional (> 362 kV): 100 ft/ 30 m

PC Requirements:

With minimum configurations as:
Ethernet/USB
Windows 2000 or Windows XP
Intel Celeron 1.3 GHz
Minimum 512 MB RAM or more
Minimum 40 GB
DVD-RW

The M5200 comes with a carrying strap for easy transportation.

Specifications are subject to change without notice.

M5200 Technical Merits

Range

The M5200 provides a frequency response measurement from 10 Hz to 25 MHz. Doble recommends the default setting of 20 Hz - 2 MHz for transformers as there is limited diagnostic value in measurements outside of this range. The diagnostic frequency range of 20 Hz to 2 MHz covers the most important diagnostic areas:

- Core and Magnetic Properties
- Winding Movement and Deformation
- Interconnections – Leads and Tap Changers

Resolution

The M5200 measures the frequency response at logarithmically spaced frequency intervals of 1.2%. A constant excitation level is maintained for each frequency measurement. The M5200 has the ability to auto-scale each frequency measurement providing an overall dynamic range of 80 dB with a ± 1 dB accuracy. This gives the highest combination of dynamic range and accuracy available.

Repeatability

The M5200 is a field-ready instrument for high quality measurements. The sweep frequency approach combined with Doble's world class engineering means that frequency response measurements are highly repeatable and even subtle changes can be used for diagnostic purposes.

Test Leads

We provide simple, robust test leads to handle the rigors of site testing. International tests have proven repeatedly that we have the most reliable and repeatable test leads available.

Practicality

The M5200 is supported by Doble's world class Client Service Engineers and decades of field experience. We have learned through practice and experimentation what constitutes good field technique and know how to gain value and benefit from the SFRA measurement. Let us work with you to bring that value and benefit to your company!

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