DOBLE OFF-LINE TESTING & ASSESSMENT

M5400

Sweep Frequency Response Analyzer

SFRA TOOL FOR DETECTING "HIDDEN" TRANSFORMER FAULTS

Use the Doble M5400 Sweep Frequency Response Analyzer to detect mechanical failure or movement of windings due to short circuits, mechanical stresses or transportation. Sweep Frequency Response Analysis is a proven technique, pioneered by Doble, for making accurate and repeatable measurements. The sweep approach is the industry standard and the preferred method for making frequency domain measurements. Coupled with the ease-of-use and powerful features of SFRA Software v6, conducting SFRA testing and analysis of your apparatus has never been easier or more productive.

FEATURES

- Instrument sends excitation signals to transformer and measures the returning signals across a broad frequency range
- Provides a frequency response measurement from 10 Hz to 25 MHz
- Measures frequency response at logarithmically spaced intervals of 1.2%
- Auto-scales each frequency measurement for an overall dynamic range of 80 dB with a ±1 dB accuracy
- Highest combination of dynamic range and accuracy available
- Simple, robust test leads that meet IEC standards

BENEFITS

- Ensure transformer performance, reduce maintenance costs and increase the service life of transformers
- Identify problems such as core movement, winding deformation & displacement, faulty core grounds, partial winding collapse, hoop buckling, broken or loose clamping structures, shorted turns & open windings
- Use as part of your regular maintenance program or any time you suspect a problem
- Measurements are highly repeatable so even subtle changes can be used for diagnostic purposes

M5400 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	3 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	3 years
DATA COLLECTION	
Test Method	Sweep Frequency
PC Comm	Ethernet USB/Serial
Frequency Range	10 Hz – 25 MHz
Number of Points	1000 points (Default) Up to1800 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	18.2 x 13.4 x 6.7 inch 46.2 x 34.0 x 17.0 cm
Weight	13.1 lbs (6.0 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

M5400 RANGE

The M5400 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

M5400 RESOLUTION

The M5400 measures the frequency response at logarithmically spaced frequency intervals of 1.2%. A constant excitation level is maintained for each frequency measurement. The M5400 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.

ORDERING INFORMATION

PART #	PRODUCT
M5400	Doble M5400 Sweep Frequency Response Analyzer
	Includes test set, instruction materials, software, 60 ft. SFRA test lead, ground extensions, safety ground, power cord and communication cables.

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