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Data Sheet 5.85-62/1

# Dielectric Frequency Response Analyzer, Type DIRANA

**Application**

The dielectric frequency response (DFR) analyzer determines the condition of high-voltage insulation systems applying the dielectric frequency response analysis. This means that the dielectric properties dissipation factor and capacitance are measured at low voltage level as a function of frequency in a wide frequency band.

The DFR analyzer can be used for applications like power and instrument transformers, bushings, cables and rotating machines.

**Description**

As the dielectric properties of oilpaper insulations are strongly affected by moisture, a dielectric frequency response analysis can be used to determine the moisture content in paper or pressboard from these properties.

The dielectric frequency response is measured by a three-terminal measurement. After the test object is switched off the output voltage, the measurement current and the guard terminals are connected to the test object. Then the measurement can be executed immediately without having to wait for the transformer to be in equilibrium.

The DFR analyzer is controlled by a PC. To assess the moisture content of paper and the conductivity of oil the results of the dielectric frequency response analysis can be evaluated with a suitable software algorithm.

**Advantages**

The dielectric frequency response method is a very reliable method with quantitative data to determine the moisture content in oilpaper insulations for a more accurate condition assessment.

The test can be performed at any temperature. There is no need to wait until the transformer has cooled down or until the moisture equilibrium is reached.

The dielectric frequency response method is a cost-effective means for maintenance purposes. It helps to improve the life cycle management of equipment.

DIRANA combines the polarization current measurement (PDC) method in time domain with the frequency domain spectroscopy (FDS) and thus significantly reduces the testing time compared to existing techniques.

Table 1: Technical Data

Technical Data	unit	Type DIRANA
<b>Output</b>		
Measurement voltage	V <sub>peak</sub>	200
Max. continuous output current	mA <sub>peak</sub>	50
<b>Performance</b>		
Dissipation factor		
Range		0 to 10
Accuracy		2% + 5*10 <sup>-4</sup>
Capacitance		
Range	F	10*10 <sup>-12</sup> to 100*10 <sup>-6</sup>
Accuracy		0.5% + 1pF
Frequency Range (FDS and PDC)	Hz	50*10 <sup>-6</sup> to 5000
Measuring time	min	15 (2mHz to 1kHz)
<b>Features</b>		
Intended Use		Mobile
Software tests		
Grounded Specimen Test ( GST )		Yes
Grounded Specimen Test Guard incl. ( GSTg )		Yes
Ungrounded Specimen Test ( UST )		Yes
Display		No
Interface		USB
Internal printer		No
Rugged case		Yes
Battery		No
<b>Dimension and weights</b>		
Length	mm	260
Width	mm	265
Height	mm	50
Weight	kg	2.3
<b>Normal operating conditions</b>		
Rated power supply voltage	V(AC)	100 to 240
Power supply frequency	Hz	50 to 60
Maximum required input power	W	60
<b>Environmental conditions</b>		
Temperature	°C	-10 to 55
Humidity	%r.H.	20 to 90, non condensing
Air-Pressure	kPa	70 to 106
<b>Accessories</b>		
Test lead and adapter set		Yes
User Manual		Yes
Power cord		Yes
USB cable		Yes
Software: DIRANA CD ROM		Yes