

DIELECTRIC ANALYZER

DIANA



The **DI**electric **ANA**lyzer **DIANA** applies a new method for measuring the loss factor tan δ of insulating materials.

As well known, the loss factor is represented by the ratio between resistive and capacitive power of the test object and expressed by the tangent of the phase angle between the resistive and capacitive vector. Using the well known Schering-bridge the loss factor is derived from the values of the resistivity and capacity values of the bridge elements in the circuit. In order to obtain a satisfactory measuring accuracy a high number of very precise and reliable elements are required as well as numerous switching contacts of reliable quality. Additionally the balance procedure is time consuming, if computer solutions are not available, which are very expensive.

The DIANA, which is a new development of LDIC, is easier to handle and faster to balance, if compared to the classical Schering-bridge.



The measuring principle bases on the analysis of the current through the test object, which is separated into the resistive and capacitive vector and displayed on the screen of an oscilloscope using the X-Y-mode. The slope of the resulting line on the oscilloscopic screen represents the loss factor tan δ . A digital display of the resistive and capacitive delivers accurate results.

Because the separation of the resistive and capacitive vector is done using electronic circuits, very precise and thus expensive elements are not required, which reduces the expenditure in the design of the device.

In contrary to the classical Schering-bridge the simple balancing procedure of DIANA makes it possible, that fast changes of the tan δ can also be simply recognized and evaluated, as for instance in the case of investigation the temperature dependence of the loss factor. Also non-linearities in the dielectric current, caused e.g. by PD's, may be discovered by considering the obtained non-linear trace on the scope-screen.

The **DIANA** is applicable for both, field and laboratory measurements.

Standard Features

- Evaluation of dielectric properties (DIN 53483)
 - loss factor
 - test object capacity
 - occurrence of PD
- Monitoring the time resolved resistive and capacitive components using the X-Y-mode
- Identification of non linear dielectric currents

Specification

The following technical parameters refer to the standard option of **DIANA** in connection with the standard HV test supply.

Max. peak value of the test voltage (50/60 Hz)	5 kV
Test object capacity range ¹⁾	0.01 pF - 2500 pF
Loss factor range ²⁾	10 ⁻¹ - 10 ⁻⁴
Minimum measurable power frequency (50/60 Hz) current ¹⁾	0.01 μA
Minimum detectable cumulative PD charge per 50/60 Hz cycle 1)	0.5 pC

On request by the user the parameters (test object capacity, magnitude and frequency of the test voltage) can be changed optionally.

¹⁾ test voltage 5 kV peak

 $^{2)}$ test voltage 5 kV peak and test object capacity > 10 pF

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